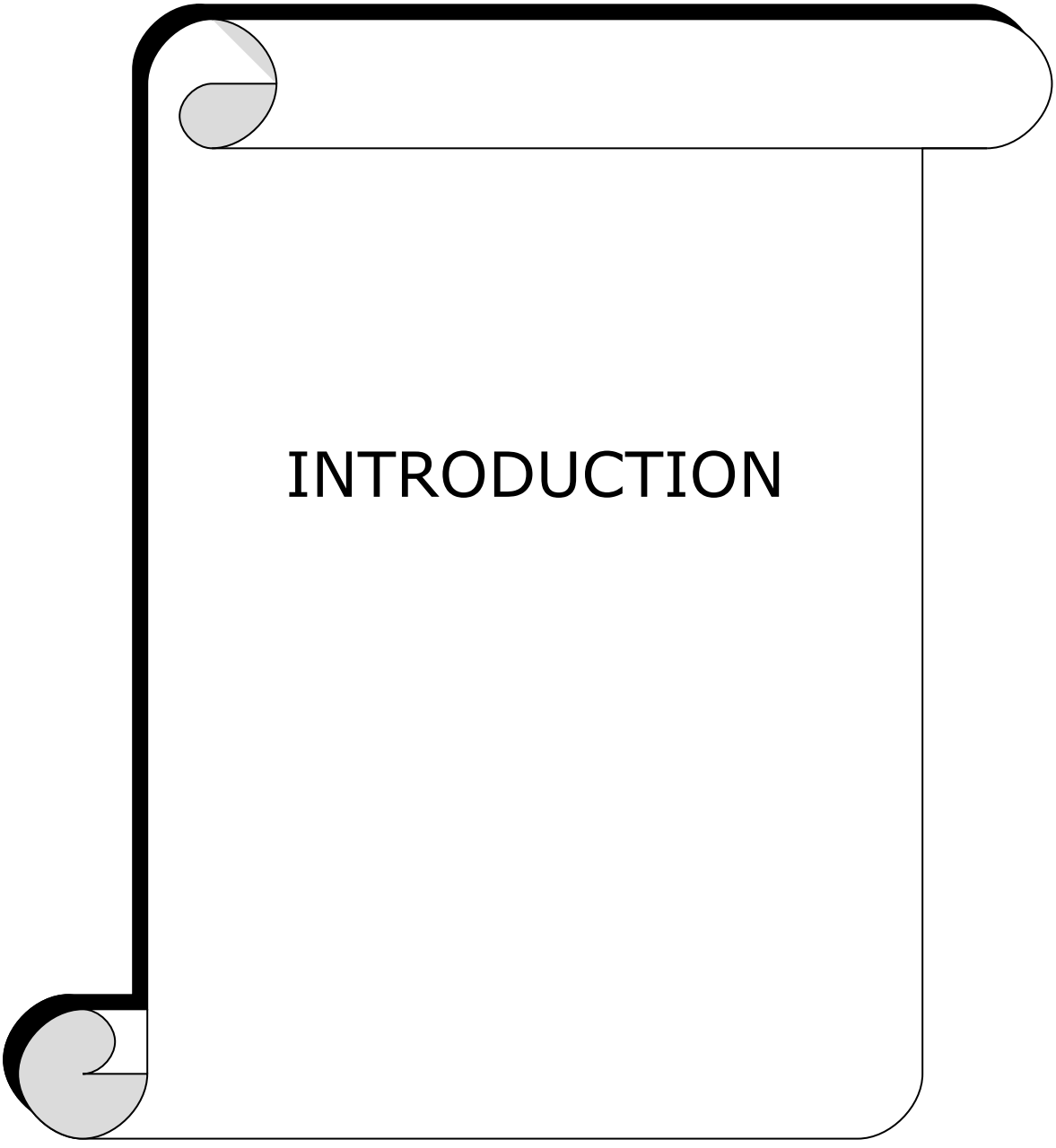
A study the efficacy of antimiasmatic medicines in the treatment of Urolithiasis.



INTRODUCTION

All great forward movements in religion, science or art originate in the mind of some individual who appears at the psychological moment and announces his mission. His personality and his teaching represent the truth for which he stands. He only is "The Master" to whom the first great revelation of truth was made and by whom it was first developed and proclaimed; for such epochal men are supremely endowed and specially prepared, usually by many years of seclusion, intense thought and labor. They are raised up at last to do a great work. They stand on the mountaintops of human experience, from whence they have a field of view and a grasp of truth never before attainable.

Disciples or would-be disciples have always to be on guard against false teaching. Their principal safeguard is in maintaining a sincere and intelligent loyalty to the historic leader whose personality and teachings represent the original truth, and in intellectual and personal fellowship with other followers who maintain the same attitude and relation. 'The era of scientific medical experimentation begins with Hahnemann and nobody else. Scientific to the core, Hahnemann experimented scientifically for scientific observation.

The true healing art is in its nature a pure science of experience, and can and must rest upon clear facts and on the sensible phenomena pertaining to their sphere of action, for all the subjects it has to deal with are clearly and satisfactorily cognizable by the senses through experience.

Homoeopathy, the true healing art is formulated on the law of cure, ’Similia Similibus Curenter.’ The idea of fitting likes to likes in the treatment

of disease had occurred to many minds before Dr. Samuel Hahnemann. His distinction is that he grasped this as the only real and fruitful one; and he worked out his thought until he formulated it as a standing rule for the best medical practice. His doctrine of applying remedies, which operate specifically upon diseased parts alone, rather than upon those, which are healthy, must ever commend itself to the sound judgment of all thinking men.

Medicines selected upon this plan are administered single, as the drug is proved and in doses too small to excite aggravation or collateral disturbance. The knowledge of medicines are acquired through provings on the healthy human body. A single drug is proved at a time on a person and so a single medicine is administered at a time to a patient.

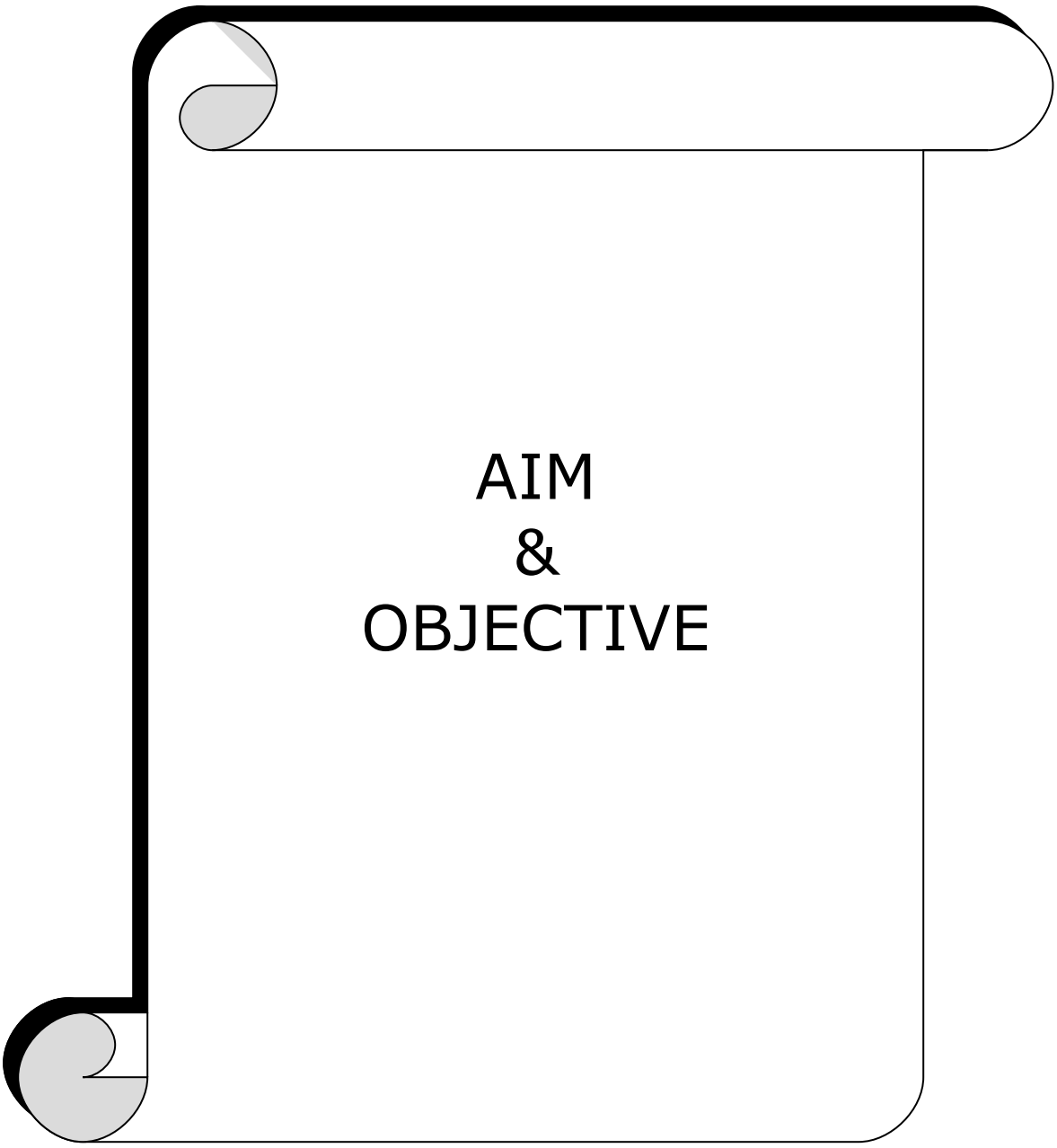
Totality of the symptoms determines the choice of the most appropriate homoeopathic remedy. Homoeopathic healing art had shown its natural superiority over any allopathic treatment in acute diseases and venereal chronic diseases. But the number of other chronic diseases despite all efforts grew worst from year to year even though homoeopathic physicians could delay its progress by treating them on the basis of the disease presented before his eyes. This situation paved the way to Dr.Hahnemann for the discovery of chronic miasms as the fundamental cause of all diseases. The concept of chronic miasms led to the discovery of anti miasmatic medicines.

In allopathic system of medicine, treatment is based on diagnosis of the disease. That means, according to the name of disease. But in homoeopathic system of medicine, totality of symptoms is the sole guide to direct the physicians in the choice of a remedy. Different patients diagnosed

as having a particular disease may require different homeopathic medicines. Although the selection of homoeopathic remedy doesn't depend absolutely on the diagnosis, it is important to a homoeopathist to forecast the prognosis, for general management, for therapeutic purpose (to know the curability of the case, to select the line of treatment, to identify the nature of disease to select the homoeopathic remedy with suitable potency, to follow up the case), for isolation and notification of contagious diseases, to convince the patient and their relatives, to issue medical certificates, death certificates etc. ,for medico legal purposes and so on..

Hahnemann says in his Materia Medica Pura "This doctrine appeals solely to the verdict of experience. Repeat the experiments, it cries aloud, repeat them carefully and accurately, and you will find the doctrine confirmed at every step."

Urolithiasis is a common clinical disorder. It is a chronic miasmatic disease. The prevalence of urolithiasis is increasing. The primary complications of urolithiasis include obstruction of urinary tract, renal parenchymal damage, infection, and adverse effects of medication or diet. Homoeopathic treatment is found to cure many cases of urolithiasis; even those seem to be of surgical cases. Removal of the primary cause prevents recurrence also. My seniors have done clinical studies and verified the efficacy of treatment of Urolithiasis based on law of similars. With due respect to our great master, I am doing a clinical study on the miasmatic approach in the treatment of urolithiasis.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OBJECTIVE

- To study the miasmatic background of the patients who develop Urolithiasis.

- To study the efficacy of antimiasmatic medicines in the treatment of Urolithiasis.

REVIEW OF LITERATURE

Miasms
Anatomy of Urinary System
Physiology of Urinary System
Urolithiasis
General concept
Homoeopathic concept

MIASMS

According to the common definition, a miasm is defined as polluting exhalations or malarial poisons[1]. Miasms can be defined as dynamic morbific agent inimical to life (Definition for miasms can be obtained from §11 of Organon of Medicine 5th Edition).

According to Gould's Medical dictionary, the term 'Miasm' or 'Miasma' means 'a pollute' or 'a noxious effluvium' or 'emanation'[2].

It was the word loosely used in his time to express the morbific emanations from putrescent organic matter, animal or vegetable, and sometimes the effluvia arising from the bodies of those affected by certain diseases, some of which were regarded as infectious and others not[3].

Parr's Medical Dictionary, London, 1819, now a very rare book, but the highest authority of that time, article, "Miasma," says: "In the more strict pathological investigation of modern authors they are distinguished from contagion, which is confined to the effluvia from the human body, when subject to disease; yet the contagion, when it does not proceed immediately from the body, but has been for some time confined in clothes, is sometimes styled miasma. Another kind of miasma (see contagion) is putrid vegetable matter, and indeed everything of this kind which appears in the form of air. Miasma, then, strictly speaking, is an aerial fluid, combined with atmospheric A and not dangerous unless the air be loaded with it[4].

That Hahnemann, in using the word miasm, had something more in mind than "an aerial fluid mixed with atmospheric air," is proven not only by his use of the word "parasitical," but by his several references to the "living beings" of which his "miasma" were composed[5].

According to Stuart Close, Hahnemann used the terminology of his day, which he qualified to suit his purpose and thus made it clear that by the word "miasma," amplified by the descriptive terms "Infectious, contagious, excessively minute, invisible living creatures" as applied to cholera, he meant precisely what we mean today when we use the terms of bacteriology to express the same idea[6].

A good definition for miasm is given by S P Dey's "Essentials of principles and practice of homoeopathy". It reads as "miasm is an invisible polluting substance which once gains entrance into the system of a living human being and overpowers the vital dynamis, pollutes the person as a whole in such a way that it leaves behind a permanent stigma or dyscrasia which if not completely eradicated with the help of suitable antimiasmatic treatment, will persist throughout the life of the patient and may be transmitted through generation after generation."

HAHNEMANN'S VIEW ON MIASMS

Dr. Hahnemann classifies the dynamic diseases broadly into two in §72. "The disease to which man is liable are either rapid morbid processes of the abnormally deranged vital force, which have a tendency to finish their course more or less quickly, but always in a moderate time - these are termed acute diseases; - or they are diseases of such a character that, with small, often imperceptible beginnings, dynamically derange the living organism, each in its own peculiar manner, and cause it gradually to deviate from the healthy condition, in such a way that the automatic life energy, called vital force, whose office is to preserve the health, only opposes to

them at the commencement and during their progress imperfect, unsuitable, useless resistance, but is unable of itself to extinguish them, but must helplessly suffer (them to spread and) itself to be ever more and more abnormally deranged, until at length the organism is destroyed; these are termed chronic diseases. They are caused by infection with a chronic miasm." (§72, Organon Of Medicine 5th Edition).

According to Hahnemann, acute diseases are divided into three parts - (a) individual, (b) sporadic and (c) epidemic. He had also given hints of endemic and pandemic character of acute diseases.

Hahnemann divided chronic diseases in two parts 1 (a) Diseases with fully developed symptoms and (b) Diseases with very few symptoms. He again divided chronic diseases with fully developed symptoms in two parts - (i) Non-miasmatic and (ii) Miasmatic.

Non-miasmatic diseases are again sub-divided into two groups: (i) diseases due unhygienic mode of living (inappropriately called Chronic diseases), (ii) diseases due to continued application of non-homoeopathic drugs in crude forms or drug addictions (Artificial chronic diseases).

Miasmatic chronic diseases are of two types venereal and non-venereal. Miasmatic chronic diseases are due to chronic miasms. All the non-venereal chronic diseases are due to psora.(this forms atleast seven-eighths of all the chronic maladies). While the remaining eighth springs from Syphilis and sycosis, or from a complication of two of these three miasmatic chronic disease, or (which is rare) from a complication of all three of them.

All chronic diseases of mankind that have not been thoroughly healed by the medical art evermore increase with the years, and during the whole of man's lifetime and they cannot be diminished by the strength belonging even

to the most robust constitution. Still less can they be overcome and extinguished. Thus they never pass away of themselves, but increase and are aggravated even till death. They must therefore all have for their origin and foundation constant chronic miasms, whereby their parasitical existence in the human organism is enabled to continually rise and grow[7].

Among the three chronic miasms, PSORA is that most ancient, most universal, most destructive, and yet most misapprehended chronic miasmatic disease which for many thousands of years has disfigured and tortured mankind, and which during the last centuries has become the mother of all the thousands of incredibly various (acute and) chronic (non-venereal) diseases, by which the whole civilized human race on the inhabited globe is being more and more afflicted[7].

PSORA is the oldest and most hydra-headed of all the chronic miasmatic diseases. In the many thousands of years during which it may have afflicted mankind, -for the most ancient history of the most ancient people does not reach to its origin,- it has so much increased in the extent of its pathological manifestations -an extent which may to some degree be explained by its increased development during such all inconceivable number of years in so many millions of organisms through which it has passed,- that its secondary symptoms are hardly to be numbered[8].

The oldest monuments of history which we possess show the Psora even then in great development. The Occidental Psora, which during the Middle Ages had raged in Europe for several centuries under the form of malignant erysipelas (called St. Anthony's Fire), reassumed the form of leprosy through the leprosy which was brought back by the returning crusaders in the thirteenth century. This PSORA found at least an external alleviation in the means conducive to cleanliness, the more frequent use of warm baths, as well as through the more exquisite diet and refinement in the

mode of living introduced by increased cultivation, the external horrors of the Psora within the space of several centuries were at last so far moderated, that, at the end of the fifteenth century it appeared only in the form of the common eruption of itch which could be much more easily removed from the skin through various means[9].

Nevertheless they were scratched continually because of their unbearable itching, and thus the fluid was diffused around, and the psoric miasma was communicated more certainly and more easily to many other persons, the more it was concealed[9]. PSORA has thus become the most infectious and most general of all the chronic miasmas.

With respect to the origin of these three chronic maladies, as in the acute, miasmatic eruptional diseases, three different important moments are to be more attentively considered than has hitherto been done: First, the time of infection; secondly, the period of time during which the whole organism is being penetrated by the disease infused, until it has developed within; and thirdly, the breaking out of the external ailment, whereby nature externally demonstrates the completion of the internal, development of the miasmatic malady throughout the whole organism[10].

The infection with miasmas, as well of the acute as of the above-mentioned chronic diseases, takes place, without doubt, in one single moment, and that moment, the one most favorable for infection[11].

For acute miasmatic diseases the human constitution possesses that process which, as a rule, is so beneficent: to wipe them out (i.e., the specific fever together with the specific eruption) in the course of from two to three weeks, and of itself to extinguish than again, through a kind of decision (crisis), from the organism, so that man then is wont to be entirely healed of them and, indeed, in a short time, unless he be killed by them[12].

In the chronic miasmatic diseases nature observes the same course with respect to the mode of contagion and the antecedent formation of the internal disease, before the external declarative symptoms of its internal completion manifests itself on the surface of the body; but then that great remarkable difference from the acute diseases shows itself, that in the chronic miasmata the entire internal disease, as we have mentioned before, remains in the organism during the whole life, yea, it increases with every year, if it is not exterminated and thoroughly cured by art[12].

Only the primary skin symptom of the psora which has permeated the whole organism (and which as more manifestly falling under the cognizance of the senses has the name of itch), only this eruption, as well as the sores which later arise from it and are attended on their borders with the itching peculiar to psora, as also the herpes which has this peculiar itching and which becomes humid when rubbed (the tetter), as also the tinea capitis - these alone can propagate this to other persons, because they alone contain the communicable miasma of the psora. But the remaining secondary symptoms of the psora, which in time manifest themselves after the disappearance or the artificial expulsion of the eruption, i.e., the general psoric ailments, cannot at all communicate this disease to others[13].

However small the internal psora, may be at the time of the quick suppression of an itch-eruption, which has only developed a few vesicles and which is then followed by only moderate ailments and complaints (which are then usually, from ignorance, ascribed by the domestic physician to other causes of little import): the internal malady of psora, although as yet of slight degree, remains in its character and in its chronic nature the same general psoric disease of the whole organism; i.e., without the aid of art it is ineradicable, and cannot be extirpated by the strength of even the best and most robust bodily constitution, and it will increase even to the end of the

patient's life. It is usually the case, indeed, that this disease, deprived as early as possible of the first traces of its cutaneous symptom by local applications, will grow but slowly in the beginning and will make but slow progress in the organism -much slower- progress than where the eruption has been allowed to remain for a long time on the skin; for in the latter case the progress of the internal psora is of immense rapidity; but the disease, nevertheless, increases unceasingly, and even in the best cases and under the most favorable circumstances, quietly and often for years unperceived by the eyes; so that anyone, who does not know the signs of its latent presence, would suppose and declare such persons to be healthy and free from any internal malady[14]. Dr. Hahnemann also describes the symptoms of latent Psora and the effective treatment of the chronic diseases using anti-miasmatic medicines.

J. H. ALLEN'S VIEW ON MIASMS

After the work of Dr. Samuel Hahnemann, a considerable progress in the knowledge of miasms are made by J.H. Allen's "The chronic miasms and pseudo psora." Nobody else gives such elaborate view on sycosis as Allen.

As per J.H. Allen, We cannot select the most similar remedy possible unless we understand the phenomena of the acting and basic miasms; for the true similia is always based upon the existing basic miasms[15].

The curative remedy is but the pathopoesis of a certain pathogenesis of an existing miasm. The proving of a remedy would be very indefinite to us if the name were with held from us. Similar is with the disease producing agent[15].

We should know, not only the name of the underlying principle that fathers the phenomena but also a definite knowledge of these disease forces

i.e. miasms. Suppose if we prescribe the similar remedy and have no knowledge of the laws of action and reaction (or primary and secondary action) how can we watch the progress of a case without a definite knowledge of these disease forces (miasms) [16].

In fact, if we know nothing about the traits and characteristic of our enemy, is it possible to wage an equal warfare? Why should the disease return in the same form or some diverse form? [16]

These are the things that disturbed the mind of Hahnemann, and in the end, led him to discover the psoric theory of disease[16].

Knowledge of all miasmatic phenomena would be, in toto, a complete knowledge of all that is known as diseases, and beyond these symptoms there is nothing discoverable or recognizable as disease[17].

Describes simple reasons given by Hahnemann as proof of the existence of a chronic miasm[18]

- Persistency of chronic ailments, seen when the diet, hygiene and general health of those patients were carefully considered.
- With no external aetiological reason they seen to come from within the organism itself developing from some peculiar dynamis within[19].
- Hahnemann also observed that they accompanied some physiological process, or were in some way connected with the functions of the organism.
- Again he saw, under the action of the homoeopathic remedy (curative action) disease disappear suddenly by the use of the higher potencies, often changing its expression, a sort of retro-metamorphosis, or a receding of disease in the reverse order that it came, going back through, finally disappearing at

together, leaving no trace of its prior existence. These thoughts came to him, when did it begin? What was the source of its existence? [19]

It must be some latent, inherent, internal, pre existing cause, having its habitual in the organism, yet not connected in a material way with that organism, but with that dynamic, the life force itself, becoming a part of it or co-existent with it, and having a similar dynamis, which arose and fell as it was disturbed by other causes from without, known in our nomenclature as secondary, or existing causes. Thus he noticed the skin never produced an eruption upon itself (outside of traumatic or chemical causes); never assuming a morbid state unless obliged to do so by some previous perverted change or abnormal activity in the organism itself[19].

Today we under stand psora to be a basic miasm, not confined to any special form of eruption upon the skin of the individual, but that it is the parent of a multitude of functional and pathological changes that take place in the human organs. The business of the miasms is to kill, to destroy, to tear down; to murder life through there multiplied process. They kill by sepsis, by devitalizing the blood, by anemic states, so reducing the red blood corpuscles that there is no means left where by the organism can be fed. If they build, they build false structure, such as tumours, nodes, enlarged glands, fibrous growths, cancers etc. These we call abnormal growths or pathological states, which simply means another way of life. These false or abnormal growths are constructed out of false material, because all the process of life are false or perverted, so that a physiological truth becomes a physiological lie, or a death dealing element working, or attempting to work, with a life- giving principle[20].

The action of the miasms is to make gaps and breaches in nature that the debilitated life forces cannot repair. They destroy men's wills, hope,

courage and drive the sunshine out of life, bringing all under shadow, making him down-hearted, low spirited, hypochondriacal, even to suicide. They are co-workers with sin and with death[21].

There are certain conditions or states of the organism due wholly to the action of the miasms and recognized in our works on pathology under special names as cachexia, dyscrasia, diathesis, scrofula, struma, idiosyncrasy, predisposition, hereditary predisposition and hereditary states, all of which are due, directly or indirectly, to the workings of or they are expression of miasmatic action[22].

When we speak of cachexia we mean a depraved condition of the whole system, we mean blood changes often due to toxic causes, whether they be due to drugs such as arsenic, quinine, plumbum, mercury or to animal poisons, vaccination, or to malarial poisons; diseased states as small pox, diphtheria, syphilis, typhoid fever, etc, it is an advanced chronic, active miasmatic state, often a disintegrative process taking place usually in the fluids of the body, especially in the blood, an involvement of every cell and fibre, a dissolution of chemical constituents and biological elements, a stasis often in the elimination of waste products from the organism. Cachexias may be acute, sub acute or chronic. Some times they depend on a single miasm, and again all the chronic miasms may be present. If sycosis or syphilis is specifically combined with psora the cachexia usually assumes a semi malignant form[22]. The character of the miasm gives us the character of the affection or the disease formula[23].

THE MIASMS AND THEIR RELATIONS TO PATHOLOGY.

Post mortem changes and pathology are not always the end of miasmatic action or the end of disease, although they may be the end, or death of the patient. Hahnemann never rejected pathology, and there was

probably none more expert in making a diagnosis; but when he was through with pathology, for the sake of knowledge, he put it where it belonged, as a part of the great whole in the pyramid of symptomatology[24].

It is this minute symptomatology that Allen call our attention in our investigation and study of the miasms, for a single symptom often m miasmatics may guide you to the discovery of some one of the chronic miasms that you have over looked for an indefinite time in your treatment of the case a single persistent symptom is often quite a positive sign of a suppression, and if suppressed, compels the life forces to set up another symptom no less positive and no less persistent, taking a deeper hold on the organism, therefore more difficult to eradicate[24].

The pathology of today differs from pathology of ten years ago. It differs because of the increase of sycotic diseases, which we know to be greatly on the increase, by the constant suppression of these disease processes, by the present modern powerful suppressive agents in use today, by the imperfect life, diet, hygiene etc. Hahnemann's wisdom and foresight help in recognizing the fact that disease lies not in the pathology alone, but in the totality of the symptoms in each individual case[25].

The pathological symptoms are not first causes in any case. There is some thing behind pathology, something a little deeper down in each case. Pathology may be a death process, but it was first a perverted life process, first a perverted physiology, a perverted function, and functional change preceded, and do precede, all pathology. Pathology is the finished work of the perverted life action. In pathology the term pathognomonic symptoms is intended to express the keynote of a disease, just as we use keynote in drug proving. But it does not express that disease in its fullness or designate the distinctive features that characterize one disease from another so, like wise, we say of pathology that it does not represent fully the expression of the

disease in a given case. The true pathognomonic symptoms of a given case are those that cover the existing active miasm. In this way our therapeutic grouping becomes a miasmatic one and not a pathological one[26].

Hahnemann says, "This primitive disease evidently owed its existence to some chronic miasm". Now this wonderful revelation of disease, nor had such a flood of light thrown upon the phenomena of disease[27]. "Hahnemann's recognition of this primitive existence in a chronic miasm is the only true conception of disease[28].

Allen also deals with the relationship of the miasms to abnormal growths. All disease was first disturbed fiinction and later on, as the functional disturbance increased and become more intensified, it becomes pathological[29]. To us, as homoeopaths, a tumour or any abnormal growth, infact, any pathological formation, is but a landmark of miasmatic action or change. For these manifestations present on themselves the prehistoric history of such change and such action and recognition of the real, the miasma, the subversive force as distinguished through the phenomena of disease action. They are simply ripening or ripened fruit of that prolonged perverted life action[30]. We see in abnormal growths two things; the pathological condition and the phenomena of that condition[31].

We must admit that no abnormal growth can be formed without the Work of the life force. We will further admit that a normal or healthy life force could not and does not construct one, as it has no power, outside of its normal physiologic action. How was it formed? There are many ways by which the life force might be disturbed that would bring forth an abnormal growth, such as a suppression of a discharge, injury to a part, suppression of disease states, such as eruptive diseases, pain, ulcerations or any marked disease process. Any stasis of disease or miasmatic suppression may produce

an abnormal growth[32]. Allen also describes about the ways of suppression of miasms, its consequences and about various disease states.

H. A. ROBERT'S VIEW ON MIASMS

All the three miasms have their characteristic differences. The accentuation of psora is function; the accentuation of the syphilitic taint is ulcerative; the accentuation of sycosis is infiltration and deposits[33].

When suppressed, the syphilitic stigma spends itself on the meninges of the brain, and affects the larynx and throat in general, the eyes, the bones and the periosteum[33].

Psora spends its action very largely upon the nervous system and the nerve centres, producing functional disturbances, which are > by surface manifestations[33].

Sycosis attacks the internal organs, especially the pelvic and sexual organs. In this stigma we find the worst forms of inflammation, infiltration of the tissues causing abscesses, hypertrophies, cystic degeneration; when thrown back into the system by suppression this stigma causes dishonesty, moral degeneracy and mania[33].

In treating patients suffering from these stigmata, this classification is of inestimable value, for it immediately throws the simillimum into a class of remedies corresponding with the accentuation of the stigma that is outstanding in the case, and this should be considered in the totality; it will often throw light upon the choice of a simillimum that is applicable to the individual case and stage of development[33].

When we are considering a case manifesting mixed stigmata, there is always one more prominent, and this will be the one requiring relief; when

this is relieved, the next in prominence must be cared for, until the patient is freed from the inheritance of generations[33].

STUART CLOSE'S VIEW ON MIASMS

While the findings and conclusions of modern pathology are accepted in large part by all schools of medicine, and serve as the common basis of the therapeutic art, there are enough variations and differences, particularly in general pathology, arising from contemplation of the subject from the homœopathic point of view to justify the creation of a special field or department, called Homœopathic General Pathology, especially as it is concerned with Chronic Diseases[34].

The names, bacilli, bacteria, microbes, micro-organisms, etc., had not been invented in Hahnemann's time, nor had the-microscope, with which Koch was able to verify the truth of Hahnemann's idea, been, invented. Hahnemann had microscope, but he had a keen, analytical mind, phenomenal intuition, logic and reasoning powers, and vast erudition. He used the terminology of his day, which he qualified to suit his purpose and thus made it clear that by the word "miasma," amplified by the descriptive terms "Infectious, contagious, excessively minute, invisible living creatures" as applied to cholera, he meant precisely what we mean today when we use the terms of bacteriology to express the same idea[6].

Hahnemann's elaborate and exhaustive studies of the nature causes of chronic diseases had previously paved the way for his theory of the nature of cholera. In these studies he extended and applied the principle of Anamnesis to the critical study of a large number of cases of many different diseases. And he proceeded to make a three-fold classification of diseases[6].

Dr.Stuart close also connects psora and tuberculosis.

PROCESO S. ORTEGA'S VIEW ON MIASMS

All the therapeutic action must be found in the curative power of nature, that is, in the vis medicatrix naturae of Hippocrates. This is the power that generates, gives form to, and cures illnesses. The wisest physician is the one who makes himself the loyal and responsive servant of the vis medicatrix naturae[35].

The MIASM must be understood in its broadest sense as a true chronic disease, predisposing condition, or morbid constitutional state which will unfailingly give rise to the different illnesses of mankind -whether of deficiency, excess or perversion - recognizable in the organic alterations as in the mental and emotional spheres[35].

Acute illnesses must be recognised and treated as efforts, or organic nature responding to stimulation of the patient's miasms, by the various ambient and determining causes. Such an approach will permit the homoeopathic physician to assist efficiently in eliminating a large part of the individual's miasmatic burden by applying the true "simillimum" corresponding precisely to the "totality of the symptoms' which are the manifestations of the dominant miasm[35].

BANEIJEA'S VIEW ON MIASMS

Definition of Miasm: An invisible, inimical, dynamic principle, which permeates into the system of a living creature, creating a groove or stigma in the constitution, which can only be eradicated by a suitable anti-miasmatic treatment. If effective anti-miasmatic treatment does not take place then the miasm will persist throughout the life of the person and will be transmitted to the next generation.

TEN PRINCIPLES ON MIASM

I. Miasm is a dynamic energy, which cannot be seen.

II. Every living creature on earth, bacteria, virus etc., has its own miasm.

III. Miasm is hostile to the life preserving energy (inimical to the vital force) of any living creature.

IV. It is dynamic, as it affects the dynamic plane and thereby dynamically deranges the life preserving energy of any living creature.

V. The basic pre-condition of a miasmatic infection is susceptibility.

VI. When a person or any living creature is susceptible (characterised by hypo-immunity = psora) the inimical, invisible dynamic principle of miasm gets the chance to permeate into the body (as the immunity is low and thereby the person is susceptible to receive such infection), this is known as miasmatic infection.

VII. After entering in the body, it tends to join the fundamental miasms already existing in the body.

VIII. Then it takes the upper hand; as the miasmatic force from outside plus the miasmatic force already dormant in the body conjoin together and dynamically affect the vital force (life preserving energy) thereby dynamic derangement of the vital force occurs.

IX. So the miasmatic force dynamically deranges the vital force, and that results in disease. There is always a battle going on inside the body between the vital force and the miasmatic force; in health the vital force wins and in disease, the miasmatic force wins.

X. The miasmatic force creates a stigma or vacuum in the constitution, which can only be eradicated by suitable anti-miasmatic medicine, otherwise it is transmitted to the next generation. Miasmatic dissection and incorporation of the same in each case will help (a) to open up a case, where there is a scarcity of symptoms due to various physical, emotional or iatrogenic suppressions, by the centrifugal action of deep acting anti-miasmatic medicines. Also of importance is the value of selecting an anti-miasmatic medicine, which covers the nature and character of the individual in absence of any recognisable totality. Thus, the anti-miasmatic medicine covers the essence of the person and opens up the case; (b) to be more confident in prescribing by including the surface miasm in the consideration of the totality, as miasm, the dyscrasia of the person, constitutes a major part of the totality; (c) to evaluate the necessity of change of the plan of treatment or change of the remedy; as few symptoms have disappeared after the first remedy, yet the miasmatic totality indicates the preponderance of the same miasm in the surface which was originally covered by the initial remedy, therefore it foretells that we can stay with the previous remedy; (d) to evaluate the homoeopathic prognosis of the j case, as removal of layers of suppression manifest as clarity of symptoms and can be accompanied by a quantum jump in the sense of well being; (e) to fulfil Hahnemann's three injunctions of cure: rapid, gentle and permanent; and (f) anti-miasmatic medicines help to clear up the suppressions (in relation to the past); clear up the presenting symptoms from its root or origin (in relation to the present); and clear up the susceptibility to get infection and thereby

strengthens the constitution (in relation to the prophylactic aspect or future).

UTILITY OF MIASM

A thorough dissection and incorporation of miasm in each case will help a homoeopathic prescriber in the following ways:

(i) A deep acting anti-miasmatic medicine by virtue of its centrifugal action will open up such cases (brings to the surface the suppressed symptoms) where the totality of symptoms.cannot be framed due to a scarcity of symptoms (i.e. one-sided cases), and those cases with conjoint or contaminated pictures due to various physical, emotional or iatrogenic suppressions.

(ii) Also of importance is the value of selecting an anti-miasmatic medicine, which covers the psychic essence, nature and character of the individual in absence of any recognisable totality. For example, a patient presents with insomnia with no distinguishing modalities or other characters to complete the symptom. By ascertaining that person's psychic essence or character (for instance, suspicious, jealous and exploiting in nature, representing sycosis) we canpresGribe an anti-miasmatic medicine to cover the insomnia and open j up the case. Thus, the anti-miasmatic medicine covering the essence of the person is capable of surfacing the suppressed symptoms and the totality can then easily be framed.

(iii) To be more confident in prescribing by including the surface miasm of the case in the consideration of the totality;as miasm, the dyscrasia of the person, constitutes a major part of that totality. Miasm and the symptoms are nothing but the two sides of the coin, and one cannot be considered whilst ignoring the other. In fact, the totality of symptoms cannot be said to be total until and unless the selected remedy covers the miasm.

(iv) To evaluate the necessity of a change in the plan of treatment or a change of remedy; when few symptoms have disappeared after the first remedy has been administered, yet the miasmatic totality shows the preponderance of the same miasm on the surface as that which was originally covered by the initial remedy. It indicates that the prescriber can stay with that initial remedy, as can be seen from the following example: a patient came with the presenting symptom of facial wart, for which Causticum was prescribed. As this medicine covers the miasm (here in this case, sycosis) as well as the symptom, the wart has fallen off; and the next suppressed layer, perhaps a profuse yellowish leucorrhoea (which was previously suppressed by cauterisation) comes to the surface. This symptom too is a sycotic manifestation, and is also covered by Causticum, then that remedy will totally eradicate the problem. So knowledge of miasm guides us to stay with the remedy and to allow its full and complete action.

(v) To evaluate the homoeopathic prognosis of the case, as removal of layers of suppression are manifested as clarity of symptoms and also reflected by a quantum jump in the sense of well-being. Deep acting anti-miasmatic medicines by virtue of their centrifugal action will remove the layers of suppression, which can be evidenced as follows:

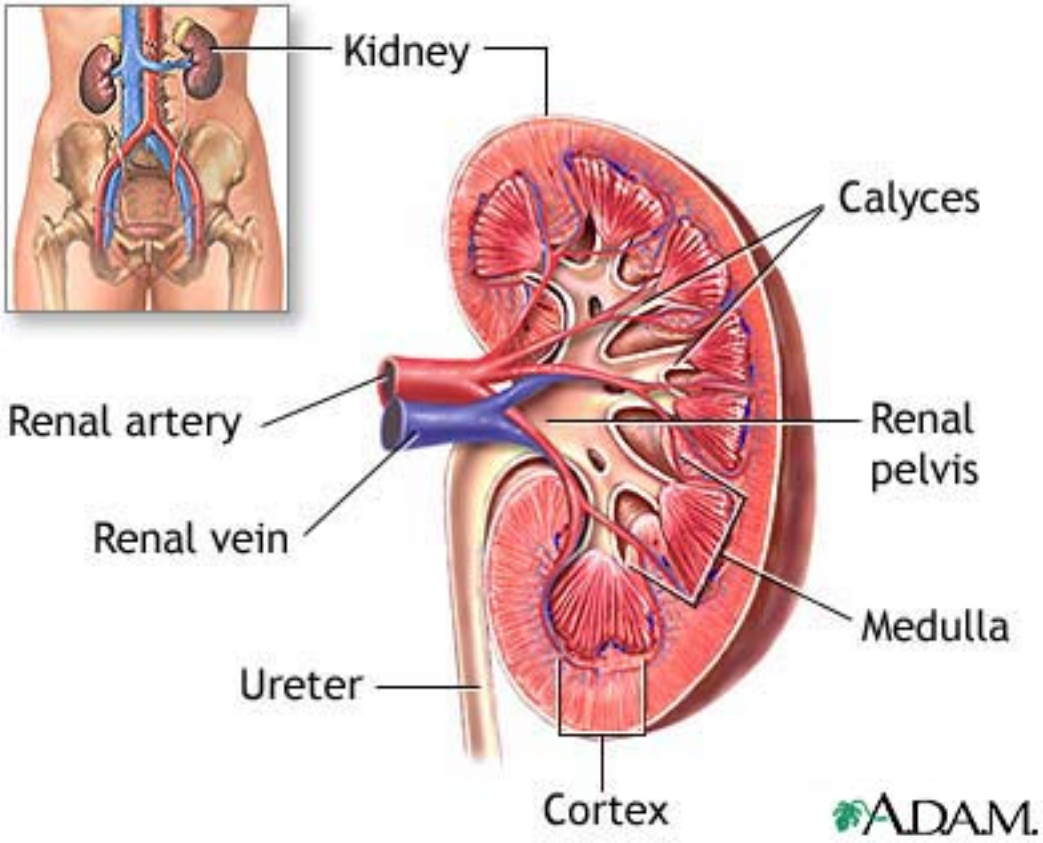
a) A quantum jump in the sense of well being.
b) Improved energy.
c) Increased appetite.
d) Better quality of sleep.
e) Harmony and tranquillity of temperament.
f) Stability (in obese people) or weight gain in under weight subjects.
g) Clarity of the existing or presenting symptoms or even lighter symptoms.

h) Suppressed symptoms (even of years ago) reappear on the surface and are permanently eradicated. This reappearance can be in a very transient form, which may not even be visible to the naked eye.

(vi) To fulfil Hahnemann's three injunctions of cure: rapid, gentle and permanent.

(vii) Anti-miasmatic medicines help to clear up the suppressions (in relation to the past); clear up the presenting symptoms from their root or origin (in relation to the present); and clear up the susceptibility to get infection and thereby strengthening the constitution (in relation to the prophylactic aspect or future).

ANATOMY OF URINARY SYSTEM


Kidney
Calyces
Renal artery
Renal pelvis
Renal vein
Medulla
Ureter
Cortex
A.D.A.M.

INTRODUCTION

The urinary organs comprise the kidneys, which secrete the urine, the ureters, or ducts, which convey urine to the urinary bladder, where it is for a time retained; and the urethra, through which it is discharged from the body.

1. THE KIDNEYS

The kidneys are situated in the posterior part of the abdomen, one on either side of the vertebral column, behind the peritoneum, and surrounded by a mass of fat and loose areolar tissue. Their upper extremities are on a level with the upper border of the twelfth thoracic vertebra, their lower extremities on a level with the third lumbar. The right kidney is usually slightly lower than the left, probably on account of the vicinity of the liver. The long axis of each kidney is directed downward and lateralward; the transverse axis backward and lateralward.

Each kidney is about 11.25 cm. in length, 5 to 7.5 cm. in breadth, and rather more than 2.5 cm. in thickness. The left is somewhat longer, and narrower, than the right. The weight of the kidney in the adult male varies from 125 to 170 gm., in the adult female from 115 to 155 gm. The combined

weight of the two kidneys in proportion to that of the body is about 1 to 240.

The kidney has a characteristic form, and presents for examination two surfaces, two borders, and an upper and lower extremity.

Relations - The anterior surface (Figs. 2.1.1 and 2.1.3) of each kidney is convex, and looks forward and lateralward. Its relations to adjacent viscera differ so completely on the two sides that separate descriptions are necessary.

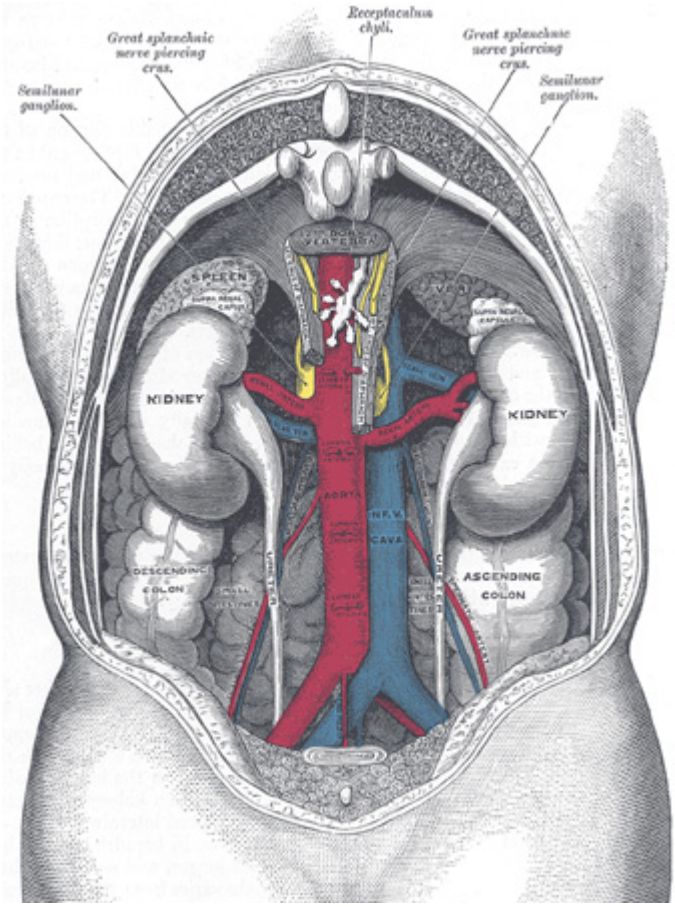


FIG. 2.1.1– The relations of the viscera and large vessels of the abdomen. (Seen from behind, the last thoracic vertebra being well raised.)

Anterior Surface of Right Kidney - A narrow portion at the upper extremity is in relation with the right suprarenal gland. A large area just below this and involving about three-fourths of the surface, lies in the renal

impression on the inferior surface of the liver, and a narrow but somewhat variable area near the medial border is in contact with the descending part of the duodenum. The lower part of the anterior surface is in contact laterally with the right colic flexure, and medially with the small intestine. The areas in relation with the liver and small intestine are covered by peritoneum; the suprarenal, duodenal, and colic areas are devoid of peritoneum.

Anterior Surface of Left Kidney - A small area along the upper part of the medial border is in relation with the left suprarenal gland, and close to the lateral border is a long strip in contact with the renal impression on the spleen. A somewhat quadrilateral field, about the middle of the anterior surface, marks the site of contact with the body of the pancreas, on the deep surface of which are the lienal vessels. Above this is a small triangular portion, between the suprarenal and splenic areas, in contact with the postero-inferior surface of the stomach. Below the pancreatic area the lateral part is in relation with the left colic flexure, the medial with the small intestine. The areas in contact with the stomach and spleen are covered by the peritoneum of the omental bursa, while that in relation to the small intestine is covered by the peritoneum of the general cavity; behind the latter are some branches of the left colic vessels. The suprarenal, pancreatic, and colic areas are devoid of peritoneum.

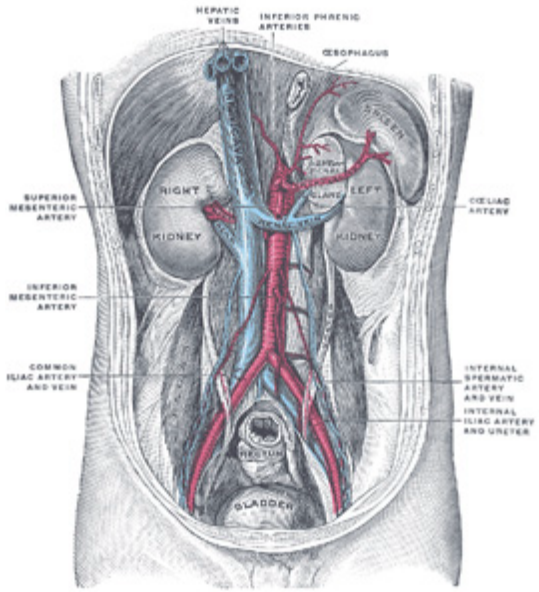


FIG. 2.1.2– Posterior abdominal wall, after removal of the peritoneum, showing kidneys, suprarenal capsules, and great vessels. (Corning).

The Posterior Surface (Figs. 2.1.4, 2.1.5).—The posterior surface of each kidney is directed backward and medialward. It is imbedded in areolar and fatty tissue and entirely devoid of peritoneal covering. It lies upon the diaphragm, the medial and lateral lumbocostal arches, the Psoas major, the Quadratus lumborum, and the tendon of the Transversus abdominis, the subcostal, and one or two of the upper lumbar arteries, and the last thoracic, iliohypogastric, and ilioinguinal nerves. The right kidney rests upon the twelfth rib, the left usually on the eleventh and twelfth. The diaphragm separates the kidney from the pleura, which dips down to form the phrenicocostal sinus, but frequently the muscular fibers of the diaphragm are defective or absent over a triangular area immediately above the lateral lumbocostal arch, and when this is the case the perinephric areolar tissue is in contact with the diaphragmatic pleura.

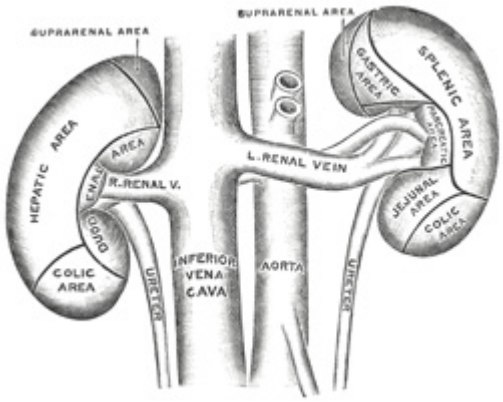


FIG. 2.1.3– The anterior surfaces of the kidneys, showing the areas of contact of neighboring viscera.

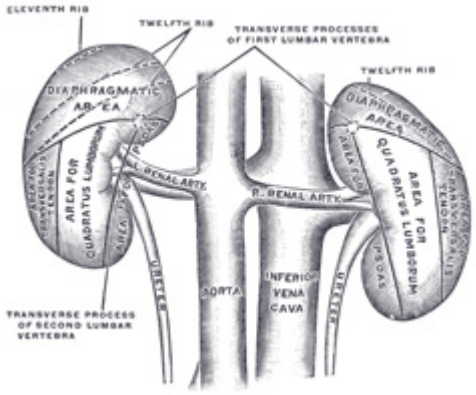


FIG. 2.1.4– The posterior surfaces of the kidneys, showing areas of relation to the parietes.

Borders - The lateral border is convex, and is directed toward the postero-lateral wall of the abdomen. On the left side it is in contact at its upper part, with the spleen.

The medial border is concave in the center and convex toward either extremity; it is directed forward and a little downward. Its central part presents a deep longitudinal fissure, bounded by prominent overhanging anterior and posterior lips. This fissure is named the hilum, and transmits the vessels, nerves, and ureter. Above the hilum the medial border is in relation with the suprarenal gland; below the hilum, with the ureter.

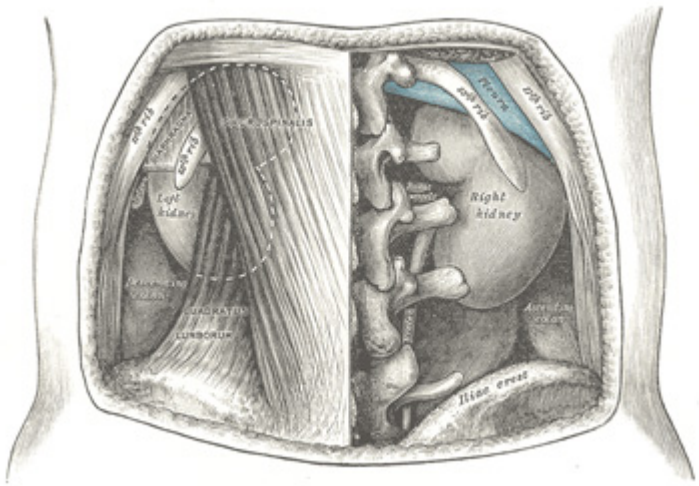


FIG. 2.1.5– The relations of the kidneys from behind.

Extremities - The superior extremity is thick and rounded, and is nearer the median line than the lower; it is surmounted by the suprarenal gland, which covers also a small portion of the anterior surface.

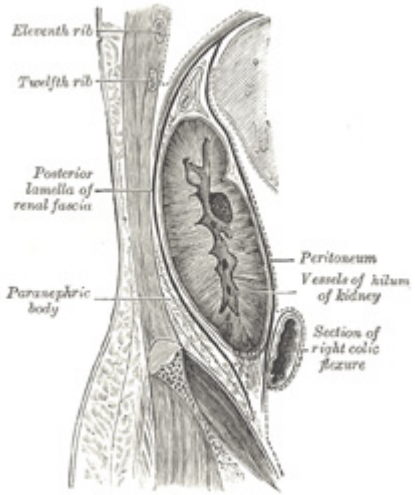


FIG. 2.1.6– Sagittal section through posterior abdominal wall, showing the relations of the capsule of the kidney. (After Gerota).

The inferior extremity is smaller and thinner than the superior and farther from the median line. It extends to within 5 cm. of the iliac crest.

The relative position of the main structures in the hilum is as follows: the vein is in front, the artery in the middle, and the ureter behind and

directed downward. Frequently, however, branches of both artery and vein are placed behind the ureter.

Fixation of the Kidney - (Figs. 2.1.6, 2.1.7).—The kidney and its vessels are imbedded in a mass of fatty tissue, termed the adipose capsule, which is thickest at the margins of the kidney and is prolonged through the hilum into the renal sinus. The kidney and the adipose capsule are enclosed in a sheath of fibrous tissue continuous with the subperitoneal fascia, and named the renal fascia. At the lateral border of the kidney the renal fascia splits into an anterior and a posterior layer. The anterior layer is carried medialward in front of the kidney and its vessels, and is continuous over the aorta with the corresponding layer of the opposite side. The posterior layer extends medialward behind the kidney and blends with the fascia on the Quadratus lumborum and Psoas major, and through this fascia is attached to the vertebral column. Above the suprarenal gland the two layers of the renal fascia fuse, and unite with the fascia of the diaphragm; below they remain separate, and are gradually lost in the subperitoneal fascia of the iliac fossa. The renal fascia is connected to the fibrous tunic of the kidney by numerous trabeculæ, which traverse the adipose capsule, and are strongest near the lower end of the organ. Behind the fascia renalis is a considerable quantity of fat, which constitutes the paranephric body. The kidney is held in position partly through the attachment of the renal fascia and partly by the apposition of the neighboring viscera.

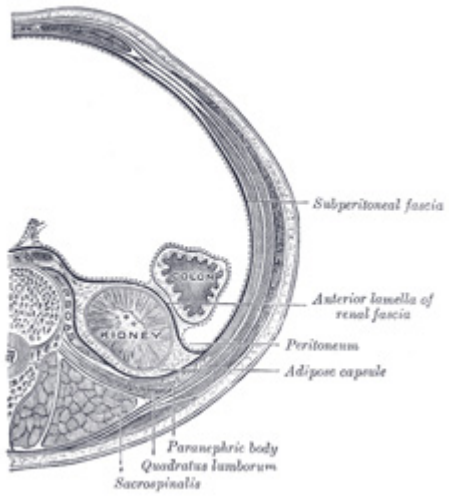


FIG. 2.1.7– Transverse section, showing the relations of the capsule of the kidney. (After Gerota.)

General Structure of the Kidney - The kidney is invested by a fibrous tunic, which forms a firm, smooth covering to the organ. The tunic can be easily stripped off, but in doing so numerous fine processes of connective tissue and small bloodvessels are torn through. Beneath this coat a thin, wide-meshed net-work of unstriped muscular fiber forms an incomplete covering to the organ. When the capsule is stripped off, the surface of the kidney is found to be smooth and even and of a deep red color. The kidney is dense in texture, but is easily lacerable by mechanical force. If a vertical section of the kidney be made from its convex to its concave border, it will be seen that the hilum expands into a central cavity, the renal sinus, this contains the upper part of the renal pelvis and the calyces, surrounded by some fat in which are imbedded the branches of the renal vessels and nerves. The renal sinus is lined by a prolongation of the fibrous tunic, which is continued around the lips of the hilum. The renal calyces, from seven to thirteen in number, are cup-shaped tubes, each of which embraces one or more of the renal papillæ; they unite to form two or three short tubes, and these in turn join to form a funnel-shaped sac, the renal pelvis. The renal pelvis, wide above and narrow below where it joins the ureter, is partly outside the renal sinus. The renal calyces and pelvis form the upper expanded end of the excretory duct of the kidney.

The kidney is composed of an internal medullary and an external cortical substance. The medullary substance consists of a series of red-colored striated conical masses, termed the renal pyramids, the bases of which are directed toward the circumference of the kidney, while their apices converge toward the renal sinus, where they form prominent papillæ projecting into the interior of the calyces.

The cortical substance is reddish brown in color and soft and granular in consistence. It lies immediately beneath the fibrous tunic, arches over the bases of the pyramids, and dips in between adjacent pyramids toward the renal sinus. The parts dipping in between the pyramids are named the renal columns (Bertini), while the portions which connect the renal columns to each other and intervene between the bases of the pyramids and the fibrous tunic are called the cortical arches (indicated between A and A' in Fig. 2.1.8). If the cortex be examined with a lens, it will be seen to consist of a series of lighter-colored, conical areas, termed the radiate part, and a darker-colored intervening substance, which from the complexity of its structure is named the convoluted part. The rays gradually taper toward the circumference of the kidney, and consist of a series of outward prolongations from the base of each renal pyramid.

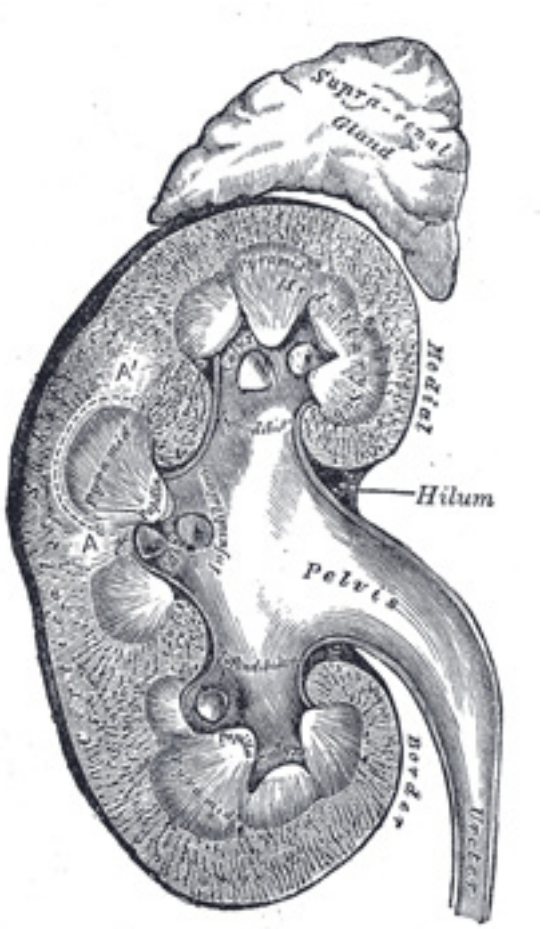


FIG. 2.1.8– Vertical section of kidney.

Parenchyma of kidney - Parenchyma of kidney contains of many closely arranged uriniferous tubules. Between the uriniferous tubules are the blood vessels and interstitial connective tissue. The tubules are of two types.

- Terminal or secretory tubules called nephrons
- Collecting ducts or tubules.

The collecting ducts unite to form ducts of Belini, which open into minor calyces.

The Renal Bloodvessels - The kidney is plentifully supplied with blood (Fig. 2.1.14) by the renal artery, a large branch of the abdominal aorta. The renal arteries arise at the level of the IV disc between the L1 and the L2 vertebrae. The longer right renal artery passes posterior to the IVC. Typically, each

artery divides close to the hilum into five segmental arteries that are end arteries. Segmental arteries are distributed to the renal segments as follows
The superior (apical) segment is supplied by the superior segmental artery; the anterosuperior and anteroinferior segments are supplied by the anterosuperior and anteroinferior segmental arteries; and the inferior segment is supplied by the inferior segmental artery. These arteries originate from the anterior branch of the renal artery
The posterior segmental artery, which originates from a continuation of the posterior branch of the renal artery, supplies the posterior segment of the kidney.

Several renal veins drain each kidney and unite in a variable fashion to form the right and left renal veins. The right and left veins lie anterior to the right and left renal arteries. The longer left renal veins receives the left suprarenal vein, the left gonadal vein, and a communication with the ascending lumbar vein, then passes anterior to the aorta. Each renal vein drains into the IVC.

Nerves of the Kidney - The nerves of the kidney, although small, are about fifteen in number. They have small ganglia developed upon them, and are derived from the renal plexus, which is formed by branches from the celiac plexus, the lower and outer part of the celiac ganglion and aortic plexus, and from the lesser and lowest splanchnic nerves. They communicate with the spermatic plexus, a circumstance which may explain the occurrence of pain in the testis in affections of the kidney. They accompany the renal artery and its branches, and are distributed to the bloodvessels and to the cells of the urinary tubules.

Connective Tissue (intertubular stroma).—Although the tubules and vessels are closely packed, a small amount of connective tissue, continuous with the

fibrous tunic, binds them firmly together and supports the bloodvessels, lymphatics, and nerves.

2. THE URETERS

The ureters are the two tubes which convey the urine from the kidneys to the urinary bladder. The Ureter Proper measures from 25 to 30 cm. in length, and is a thick-walled narrow cylindrical tube which is directly continuous near the lower end of the kidney with the tapering extremity of the renal pelvis. It runs downward and medialward in front of the Psoas major and, entering the pelvic cavity, finally opens into the fundus of the bladder.

The abdominal part lies behind the peritoneum on the medial part of the Psoas major, and is crossed obliquely by the internal spermatic vessels. It enters the pelvic cavity by crossing either the termination of the common, or the commencement of the external, iliac vessels.

At its origin the right ureter is usually covered by the descending part of the duodenum, and in its course downward lies to the right of the inferior vena cava, and is crossed by the right colic and ileocolic vessels, while near the superior aperture of the pelvis it passes behind the lower part of the mesentery and the terminal part of the ileum. The left ureter is crossed by the left colic vessels, and near the superior aperture of the pelvis passes behind the sigmoid colon and its mesentery.

The pelvic part runs at first downward on the lateral wall of the pelvic cavity, along the anterior border of the greater sciatic notch and under cover of the peritoneum. It lies in front of the hypogastric artery medial to the obturator nerve and the umbilical, obturator, inferior vesical, and middle hemorrhoidal arteries. Opposite the lower part of the greater sciatic foramen

it inclines medialward, and reaches the lateral angle of the bladder, where it is situated in front of the upper end of the seminal vesicle and at a distance of about 5 cm. from the opposite ureter; here the ductus deferens crosses to its medial side, and the vesical veins surround it. Finally, the ureters run obliquely for about 2 cm. through the wall of the bladder and open by slit-like apertures into the cavity of the viscus at the lateral angles of the trigone. When the bladder is distended the openings of the ureters are about 5 cm. apart, but when it is empty and contracted the distance between them is diminished by one-half. Owing to their oblique course through the coats of the bladder, the upper and lower walls of the terminal portions of the ureters become closely applied to each other when the viscus is distended, and, acting as valves, prevent regurgitation of urine from the bladder.

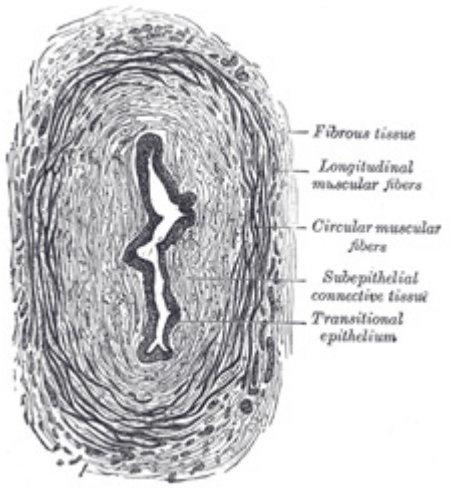


FIG. 2.2.1– Transverse section of ureter.

In the female, the ureter forms, as it lies in relation to the wall of the pelvis, the posterior boundary of a shallow depression named the ovarian fossa, in which the ovary is situated. It then runs medialward and forward on the lateral aspect of the cervix uteri and upper part of the vagina to reach the fundus of the bladder. In this part of its course it is accompanied for about 2.5 cm. by the uterine artery, which then crosses in front of the ureter

and ascends between the two layers of the broad ligament. The ureter is distant about 2 cm. from the side of the cervix of the uterus.

Structure - (Fig. 2.2.1).—The ureter is composed of three coats: fibrous, muscular, and mucous coats.

The fibrous coat is continuous at one end with the fibrous tunic of the kidney on the floor of the sinus; while at the other it is lost in the fibrous structure of the bladder.

In the renal pelvis the muscular coat consists of two layers, longitudinal and circular: the longitudinal fibers become lost upon the sides of the papillæ at the extremities of the calyces; the circular fibers may be traced surrounding the medullary substance in the same situation. In the ureter proper the muscular fibers are very distinct, and are arranged in three layers: an external longitudinal, a middle circular, and an internal, less distinct than the other two, but having a general longitudinal direction.

The mucous coat is smooth, and presents a few longitudinal folds which become effaced by distension. It is continuous with the mucous membrane of the bladder below, while it is prolonged over the papillæ of the kidney above. Its epithelium is of a transitional character, and resembles that found in the bladder (see Fig. 2.3.7). Beneath the epithelium, and separating it from the muscular coats, is a dense layer of fibrous tissue containing many elastic fibers.

Vessels and Nerves - The arteries supplying the ureter are branches from the renal, internal spermatic, hypogastric, and inferior vesical. The nerves are derived from the inferior mesenteric, spermatic, and pelvic plexuses.

3. THE URINARY BLADDER

The urinary bladder (Fig. 2.3.1) is a musculomembranous sac which acts as a reservoir for the urine; and as its size, position, and relations vary according to the amount of fluid it contains, it is necessary to study it as it appears (a) when empty, and (b) when distended. In both conditions the position of the bladder varies with the condition of the rectum, being pushed upward and forward when the rectum is distended.

The Empty Bladder - When hardened in situ, the empty bladder has the form of a flattened tetrahedron, with its vertex tilted forward. It presents a fundus, a vertex, a superior and an inferior surface. The fundus is triangular in shape, and is directed downward and backward toward the rectum, from which it is separated by the rectovesical fascia, the vesiculæ seminales, and the terminal portions of the ductus deferentes. The vertex is directed forward toward the upper part of the symphysis pubis, and from it the middle umbilical ligament is continued upward on the back of the anterior abdominal wall to the umbilicus. The peritoneum is carried by it from the vertex of the bladder on to the abdominal wall to form the middle umbilical fold. The superior surface is triangular, bounded on either side by a lateral border which separates it from the inferior surface, and behind by a posterior border, represented by a line joining the two ureters, which intervenes between it and the fundus. The lateral borders extend from the ureters to the vertex, and from them the peritoneum is carried to the walls of the pelvis. On either side of the bladder the peritoneum shows a depression, named the paravesical fossa. The superior surface is directed upward, is covered by peritoneum, and is in relation with the sigmoid colon and some of the coils of the small intestine. When the bladder is empty and firmly contracted, this surface is convex and the lateral and posterior borders are rounded; whereas if the bladder be relaxed it is concave, and the interior of the viscus, as seen

in a median sagittal section, presents the appearance of a V-shaped slit with a shorter posterior and a longer anterior limb—the apex of the V corresponding with the internal orifice of the urethra. The inferior surface is directed downward and is uncovered by peritoneum. It may be divided into a posterior or prostatic area and two infero-lateral surfaces. The prostatic area is somewhat triangular: it rests upon and is in direct continuity with the base of the prostate; and from it the urethra emerges. The infero-lateral portions of the inferior surface are directed downward and lateralward: in front, they are separated from the symphysis pubis by a mass of fatty tissue which is named the retropubic pad; behind, they are in contact with the fascia which covers the Levatores ani and Obturatores interni.

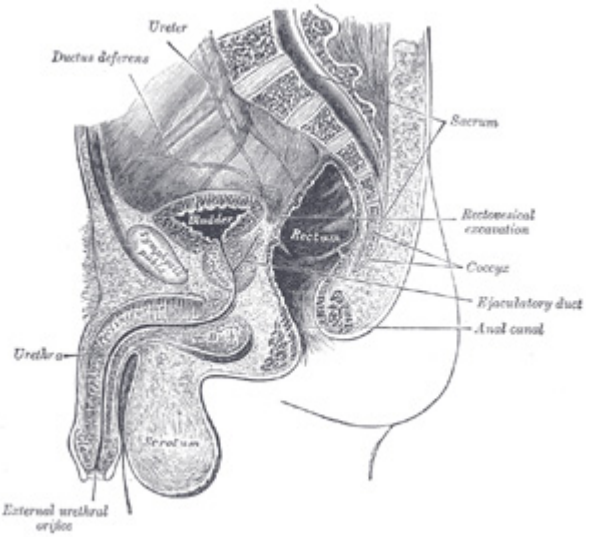


FIG. 2.3.1– Median sagittal section of male pelvis.

When the bladder is empty it is placed entirely within the pelvis, below the level of the obliterated hypogastric arteries, and below the level of those portions of the ductus deferentes which are in contact with the lateral wall of the pelvis. After they cross the ureters, the ductus deferentes come into contact with the fundus of the bladder. As the viscus fills, its fundus, being more or less fixed, is only slightly depressed; while its superior surface gradually rises into the abdominal cavity, carrying with it its peritoneal

covering, and at the same time rounding off the posterior and lateral borders.

The Distended Bladder - When the bladder is moderately full it contains about 0.5 liter and assumes an oval form; the long diameter of the oval measures about 12 cm. and is directed upward and forward. In this condition it presents a postero-superior, an antero-inferior, and two lateral surfaces, a fundus and a summit. The postero-superior surface is directed upward and backward, and is covered by peritoneum: behind, it is separated from the rectum by the rectovesical excavation, while its anterior part is in contact with the coils of the small intestine. The antero-inferior surface is devoid of peritoneum, and rests, below, against the pubic bones, above which it is in contact with the back of the anterior abdominal wall. The lower parts of the lateral surfaces are destitute of peritoneum, and are in contact with the lateral walls of the pelvis. The line of peritoneal reflection from the lateral surface is raised to the level of the obliterated hypogastric artery. The fundus undergoes little alteration in position, being only slightly lowered. It exhibits, however, a narrow triangular area, which is separated from the rectum merely by the rectovesical fascia. This area is bounded below by the prostate, above by the rectovesical fold of peritoneum, and laterally by the ductus deferentes. The ductus deferentes frequently come in contact with each other above the prostate, and under such circumstances the lower part of the triangular area is obliterated. The line of reflection of the peritoneum from the rectum to the bladder appears to undergo little or no change when the latter is distended; it is situated about 10 cm. from the anus. The summit is directed upward and forward above the point of attachment of the middle umbilical ligament, and hence the peritoneum which follows the ligament, forms a pouch of varying depth between the summit of the bladder, and the anterior abdominal wall.

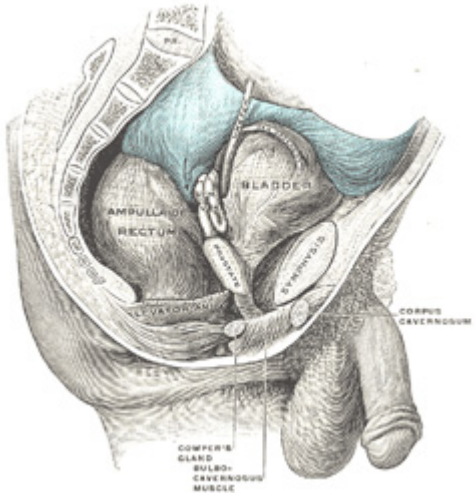


FIG. 2.3.2– Male pelvic organs seen from right side. Bladder and rectum distended; relations of peritoneum to the bladder and rectum shown in blue. The arrow points to the rectovesical pouch.

The Bladder in the Child - (Figs. 2.3.3, 2.3.4).—In the newborn child the internal urethral orifice is at the level of the upper border of the symphysis pubis; the bladder therefore lies relatively at a much higher level in the infant than in the adult. Its anterior surface "is in contact with about the lower two-thirds of that part of the abdominal wall which lies between the symphysis pubis and the umbilicus" (Symington 177). Its fundus is clothed with peritoneum as far as the level of the internal orifice of the urethra. Although the bladder of the infant is usually described as an abdominal organ, Symington has pointed out that only about one-half of it lies above the plane of the superior aperture of the pelvis. Disse maintains that the internal urethral orifice sinks rapidly during the first years, and then more slowly until the ninth year, after which it remains sta when it again slowly descends and reaches its adult position.

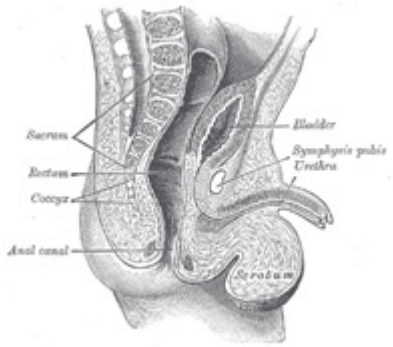


FIG. 2.3.3– Sagittal section through the pelvis of a newly born male child.

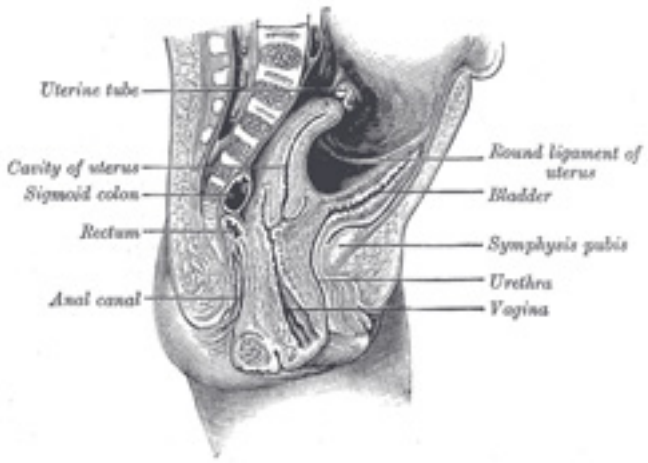


FIG. 2.3.4– Sagittal section through the pelvis of a newly born female child.

The Female Bladder - (Fig. 2.3.5).—In the female, the bladder is in relation behind with the uterus and the upper part of the vagina. It is separated from the anterior surface of the body of the uterus by the vesicouterine excavation, but below the level of this excavation it is connected to the front of the cervix uteri and the upper part of the anterior wall of the vagina by areolar tissue. When the bladder is empty the uterus rests upon its superior surface. The female bladder is said by some to be more capacious than that of the male, but probably the opposite is the case.

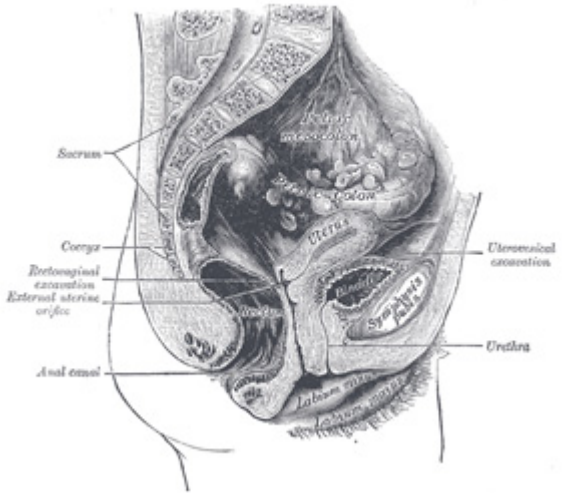


FIG. 2.3.5– Median sagittal section of female pelvis.

Ligaments - The bladder is connected to the pelvic wall by the fascia endopelvina. In front this fascial attachment is strengthened by a few muscular fibers, the Pubovesicales, which extend from the back of the pubic bones to the front of the bladder; behind, other muscular fibers run from the fundus of the bladder to the sides of the rectum, in the sacrogenital folds, and constitute the Rectovesicales.

The vertex of the bladder is joined to the umbilicus by the remains of the urachus which forms the middle umbilical ligament, a fibromuscular cord, broad at its attachment to the bladder but narrowing as it ascends.

From the superior surface of the bladder the peritoneum is carried off in a series of folds which are sometimes termed the false ligaments of the bladder. Anteriorly there are three folds: the middle umbilical fold on the middle umbilical ligament, and two lateral umbilical folds on the obliterated hypogastric arteries. The reflections of the peritoneum on to the side walls of the pelvis form the lateral false ligaments, while the sacrogenital folds constitute posterior false ligaments.

Interior of the Bladder - (Fig. 2.3.6).—The mucous membrane lining the bladder is, over the greater part of the viscus, loosely attached to the muscular coat, and appears wrinkled or folded when the bladder is contracted: in the distended condition of the bladder the folds are effaced. Over a small triangular area, termed the trigonum vesicæ, immediately above and behind the internal orifice of the urethra, the mucous membrane is firmly bound to the muscular coat, and is always smooth. The anterior angle of the trigonum vesicæ is formed by the internal orifice of the urethra: its postero-lateral angles by the orifices of the ureters. Stretching behind the latter openings is a slightly curved ridge, the torus uretericus, forming the base of the trigone and produced by an underlying bundle of non-striped muscular fibers. The lateral parts of this ridge extend beyond the openings of the ureters, and are named the plicæ uretericæ; they are produced by the terminal portions of the ureters as they traverse obliquely the bladder wall. When the bladder is illuminated the torus uretericus appears as a pale band and forms an important guide during the operation of introducing a catheter into the ureter.

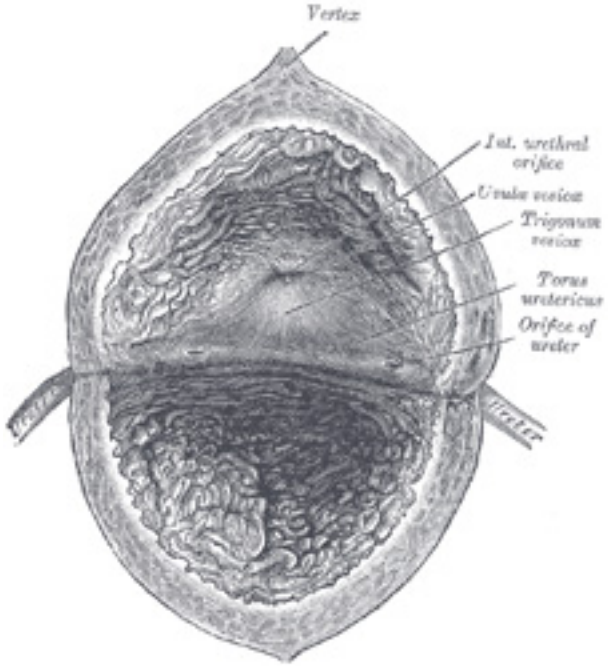


FIG. 2.3.6– The interior of bladder.

The orifices of the ureters are placed at the postero-lateral angles of the trigonum vesicæ, and are usually slit-like in form. In the contracted bladder they are about 2.5 cm. apart and about the same distance from the internal urethral orifice; in the distended viscus these measurements may be increased to about 5 cm.

The internal urethral orifice is placed at the apex of the trigonum vesicæ, in the most dependent part of the bladder, and is usually somewhat crescentic in form; the mucous membrane immediately behind it presents a slight elevation, the uvula vesicæ, caused by the middle lobe of the prostate.

Structure - (Fig. 2.3.7) - The bladder is composed of the four coats: serous, muscular, submucous, and mucous coats.

The serous coat is a partial one, and is derived from the peritoneum. It invests the superior surface and the upper parts of the lateral surfaces, and is reflected from these on to the abdominal and pelvic walls.

The muscular coat consists of three layers of unstriped muscular fibers: an external layer, composed of fibers having for the most part a longitudinal arrangement; a middle layer, in which the fibers are arranged, more or less, in a circular manner; and an internal layer, in which the fibers have a general longitudinal arrangement.

The fibers of the external layer arise from the posterior surface of the body of the pubis in both sexes (musculi pubovesicales), and in the male from the adjacent part of the prostate and its capsule. They pass, in a more or less longitudinal manner, up the inferior surface of the bladder, over its vertex, and then descend along its fundus to become attached to the prostate in the male, and to the front of the vagina in the female. At the

sides of the bladder the fibers are arranged obliquely and intersect one another. This layer has been named the Detrusor urinæ muscle.

The fibers of the middle circular layer are very thinly and irregularly scattered on the body of the organ, and, although to some extent placed transversely to the long axis of the bladder, are for the most part arranged obliquely. Toward the lower part of the bladder, around the internal urethral orifice, they are disposed in a thick circular layer, forming the Sphincter vesicæ, which is continuous with the muscular fibers of the prostate.

The internal longitudinal layer is thin, and its fasciculi have a reticular arrangement, but with a tendency to assume for the most part a longitudinal direction. Two bands of oblique fibers, originating behind the orifices of the ureters, converge to the back part of the prostate, and are inserted by means of a fibrous process, into the middle lobe of that organ. They are the muscles of the ureters, described by Sir C. Bell, who supposed that during the contraction of the bladder they serve to retain the oblique direction of the ureters, and so prevent the reflux of the urine into them.

The submucous coat consists of a layer of areolar tissue, connecting together the muscular and mucous coats, and intimately united to the latter.

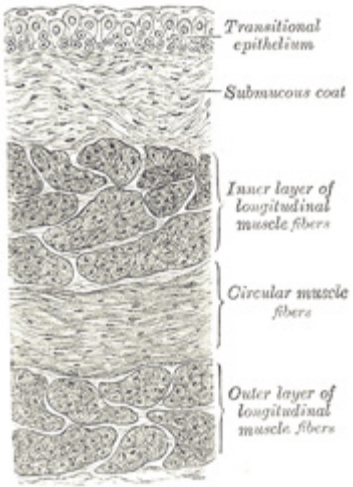


FIG. 2.3.7– Vertical section of bladder wall.

The mucous coat is thin, smooth, and of a pale rose color. It is continuous above through the ureters with the lining membrane of the renal tubules, and below with that of the urethra. The loose texture of the submucous layer allows the mucous coat to be thrown into folds or rugæ when the bladder is empty. Over the trigonum vesicæ the mucous membrane is closely attached to the muscular coat, and is not thrown into folds, but is smooth and flat. The epithelium covering it is of the transitional variety, consisting of a superficial layer of polyhedral flattened cells, each with one, two, or three nuclei; beneath these is a stratum of large club-shaped cells, with their narrow extremities directed downward and wedged in between smaller spindle-shaped cells, containing oval nuclei (Fig. 2.3.7). The epithelium varies according as the bladder is distended or contracted. In the former condition the superficial cells are flattened and those of the other layers are shortened; in the latter they present the appearance described above. There are no true glands in the mucous membrane of the bladder, though certain mucous follicles which exist, especially near the neck of the bladder, have been regarded as such.

Vessels and Nerves - The arteries supplying the bladder are the superior, middle, and inferior vesical, derived from the anterior trunk of the hypogastric. The obturator and inferior gluteal arteries also supply small visceral branches to the bladder, and in the female additional branches are derived from the uterine and vaginal arteries.

The veins form a complicated plexus on the inferior surface, and fundus near the prostate, and end in the hypogastric veins.

The nerves of the bladder are (1) fine medullated fibers from the third and fourth sacral nerves, and (2) non-medullated fibers from the hypogastric plexus. They are connected with ganglia in the outer and submucous coats

and are finally distributed, all as non-medullated fibers, to the muscular layer and epithelial lining of the viscus.

4. THE MALE URETHRA

The male urethra (Fig. 2.4.1) extends from the internal urethral orifice in the urinary bladder to the external urethral orifice at the end of the penis. It presents a double curve in the ordinary relaxed state of the penis (Fig. 2.3.3). Its length varies from 17.5 to 20 cm.; and it is divided into three portions, the prostatic, membranous, and cavernous, the structure and relations of which are essentially different. Except during the passage of the urine or semen, the greater part of the urethral canal is a mere transverse cleft or slit, with its upper and under surfaces in contact; at the external orifice the slit is vertical, in the membranous portion irregular or stellate, and in the prostatic portion somewhat arched.

The prostatic portion, the widest and most dilatable part of the canal, is about 3 cm. long, It runs almost vertically through the prostate from its base to its apex, lying nearer its anterior than its posterior surface; the form of the canal is spindle-shaped, being wider in the middle than at either extremity, and narrowest below, where it joins the membranous portion. A transverse section of the canal as it lies in the prostate is horse-shoe-shaped, with the convexity directed forward.

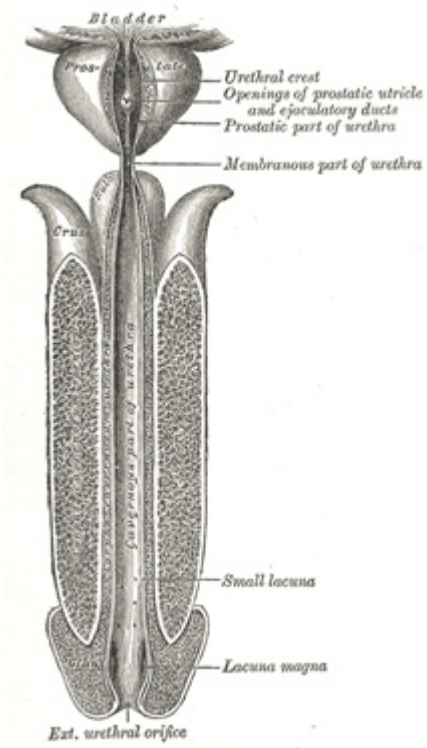


FIG. 2.4.1– The male urethra laid open on its anterior (upper) surface.

Upon the posterior wall or floor is a narrow longitudinal ridge, the urethral crest (verumontanum), formed by an elevation of the mucous membrane and its subjacent tissue. It is from 15 to 17 mm. in length, and about 3 mm. in height, and contains, according to Kobelt, muscular and erectile tissue. When distended, it may serve to prevent the passage of the semen backward into the bladder. On either side of the crest is a slightly depressed fossa, the prostatic sinus, the floor of which is perforated by numerous apertures, the orifices of the prostatic ducts from the lateral lobes of the prostate; the ducts of the middle lobe open behind the crest. At the forepart of the urethral crest, below its summit, is a median elevation, the colliculus seminalis, upon or within the margins of which are the orifices of the prostatic utricle and the slit-like openings of the ejaculatory ducts. The prostatic utricle (sinus pocularis) forms a cul-de-sac about 6 mm. long, which runs upward and backward in the substance of the prostate behind the middle lobe. Its walls are composed of fibrous tissue, muscular fibers, and

mucous membrane, and numerous small glands open on its inner surface. It was called by Weber the uterus masculinus, from its being developed from the united lower ends of the atrophied Müllerian ducts, and therefore homologous with the uterus and vagina in the female.

The membranous portion is the shortest, least dilatable, and, with the exception of the external orifice, the narrowest part of the canal. It extends downward and forward, with a slight anterior concavity, between the apex of the prostate and the bulb of the urethra, perforating the urogenital diaphragm about 2.5 cm. below and behind the pubic symphysis. The hinder part of the urethral bulb lies in apposition with the inferior fascia of the urogenital diaphragm, but its upper portion diverges somewhat from this fascia: the anterior wall of the membranous urethra is thus prolonged for a short distance in front of the urogenital diaphragm; it measures about 2 cm. in length, while the posterior wall which is between the two fasciæ of the diaphragm is only 1.25 cm. long.

The membranous portion of the urethra is completely surrounded by the fibers of the Sphincter urethræ membranaceæ. In front of it the deep dorsal vein of the penis enters the pelvis between the transverse ligament of the pelvis and the arcuate pubic ligament; on either side near its termination are the bulbourethral glands.

The cavernous portion is the longest part of the urethra, and is contained in the corpus cavernosum urethræ. It is about 15 cm. long, and extends from the termination of the membranous portion to the external urethral orifice. Commencing below the inferior fascia of the urogenital diaphragm it passes forward and upward to the front of the symphysis pubis; and then, in the flaccid condition of the penis, it bends downward and forward. It is narrow, and of uniform size in the body of the penis, measuring about 6 mm. in diameter; it is dilated behind, within the bulb, and again

anteriorly within the glans penis, where it forms the fossa navicularis urethræ.

The external urethral orifice is the most contracted part of the urethra; it is a vertical slit, about 6 mm. long, bounded on either side by two small labia.

The lining membrane of the urethra, especially on the floor of the cavernous portion, presents the orifices of numerous mucous glands and follicles situated in the submucous tissue, and named the urethral glands (Littré). Besides these there are a number of small pit-like recesses, or lacunæ, of varying sizes. Their orifices are directed forward, so that they may easily intercept the point of a catheter in its passage along the canal. One of these lacunæ, larger than the rest, is situated on the upper surface of the fossa navicularis; it is called the lacuna magna. The bulbo-urethral glands open into the cavernous portion about 2.5 cm. in front of the inferior fascia of the urogenital diaphragm.

Structure - The urethra is composed of mucous membrane, supported by a submucous tissue which connects it with the various structures through which it passes.

The mucous coat forms part of the genito-urinary mucous membrane. It is continuous with the mucous membrane of the bladder, ureters, and kidneys; externally, with the integument covering the glans penis; and is prolonged into the ducts of the glands which open into the urethra, viz., the bulbo-urethral glands and the prostate; and into the ductus deferentes and vesiculæ seminales, through the ejaculatory ducts. In the cavernous and membranous portions the mucous membrane is arranged in longitudinal folds when the tube is empty. Small papillæ are found upon it, near the external

urethral orifice; its epithelial lining is of the columnar variety except near the external orifice, where it is squamous and stratified.

The submucous tissue consists of a vascular erectile layer; outside this is a layer of unstriped muscular fibers, arranged, in a circular direction, which separates the mucous membrane and submucous tissue from the tissue of the corpus cavernosum urethræ.

5. THE FEMALE URETHRA

The female urethra (Fig. 2.3.5) is a narrow membranous canal, about 4 cm. long, extending from the internal to the external urethral orifice. It is placed behind the symphysis pubis, imbedded in the anterior wall of the vagina, and its direction is obliquely downward and forward; it is slightly curved with the concavity directed forward. Its diameter when undilated is about 6 mm. It perforates the fasciæ of the urogenital diaphragm, and its external orifice is situated directly in front of the vaginal opening and about 2.5 cm. behind the glans clitoridis. The lining membrane is thrown into longitudinal folds, one of which, placed along the floor of the canal, is termed the urethral crest. Many small urethral glands open into the urethra.

Structure - The urethra consists of three coats: muscular, erectile, and mucous.

The muscular coat is continuous with that of the bladder; it extends the whole length of the tube, and consists of circular fibers. In addition to this, between the superior and inferior fasciæ of the urogenital diaphragm, the female urethra is surrounded by the Sphincter urethræ membranaceæ, as in the male.

A thin layer of spongy erectile tissue, containing a plexus of large veins, intermixed with bundles of unstriped muscular fibers, lies immediately beneath the mucous coat.

The mucous coat is pale; it is continuous externally with that of the vulva, and internally with that of the bladder. It is lined by stratified squamous epithelium, which becomes transitional near the bladder. Its external orifice is surrounded by a few mucous follicles.

THE LYMPHATIC VESSELS OF THE URINARY ORGANS

The Lymphatic Vessels of the Kidney form three plexuses: one in the substance of the kidney, a second beneath its fibrous capsule, and a third in the perinephric fat; the second and third communicate freely with each other. The vessels from the plexus in the kidney substance converge to form four or five trunks which issue at the hilum. Here they are joined by vessels from the plexus under the capsule, and, following the course of the renal vein, end in the lateral aortic glands. The perinephric plexus is drained directly into the upper lateral aortic glands.

The Lymphatic Vessels of the Ureter run in different directions. Those from its upper portion end partly in the efferent vessels of the kidney and partly in the lateral aortic glands; those from the portion immediately above the brim of the lesser pelvis are drained into the common iliac glands; while the vessels from the intrapelvic portion of the tube either join the efferents from the bladder, or end in the hypogastric glands.

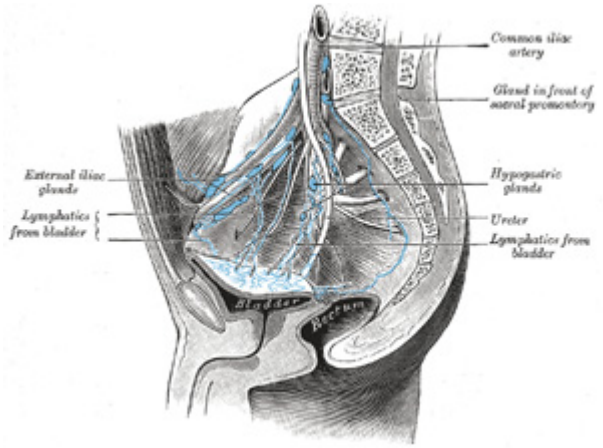


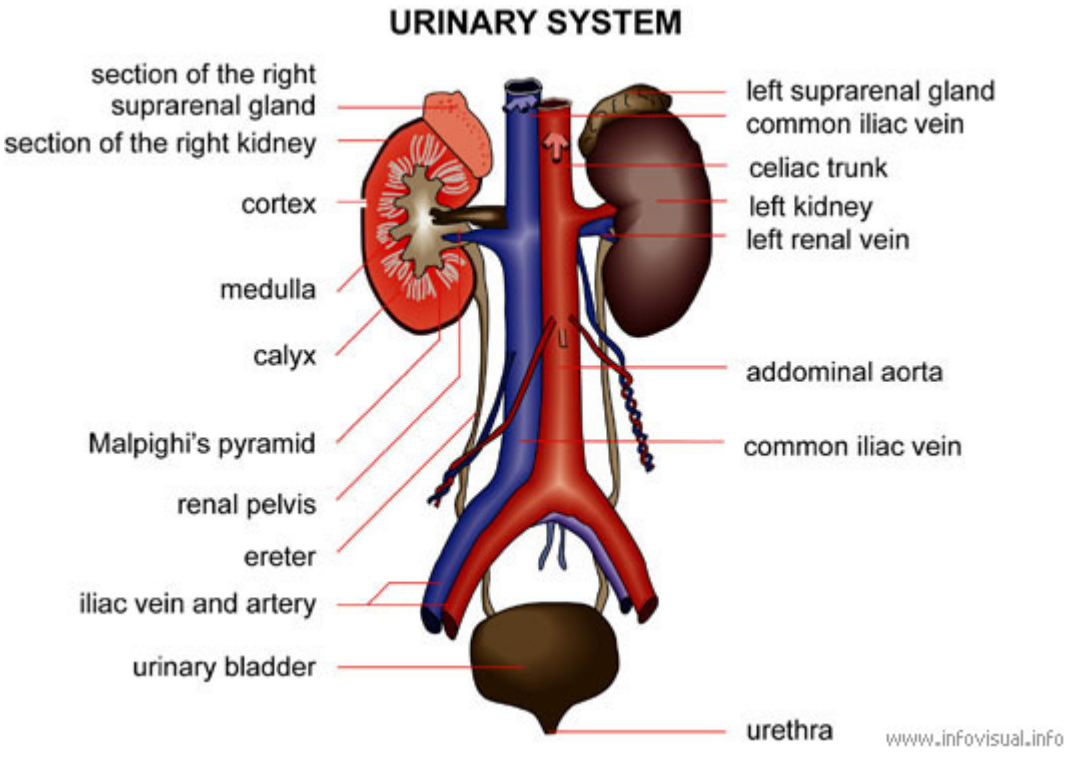
FIG. 2.5.1– Lymphatics of the bladder. (Cunéo and Marcille.)

The Lymphatic Vessels of the Bladder (Fig. 2.5.1) originate in two plexuses, an intra- and an extramuscular, it being generally admitted that the mucous membrane is devoid of lymphatics. The efferent vessels are arranged in two groups, one from the anterior and another from the posterior surface of the bladder. The vessels from the anterior surface pass to the external iliac glands, but in their course minute glands are situated. These minute glands are arranged in two groups, an anterior vesical, in front of the bladder, and a lateral vesical, in relation to the lateral umbilical ligament. The vessels from the posterior surface pass to the hypogastric, external, and common iliac glands; those draining the upper part of this surface traverse the lateral vesical glands.

The Lymphatic Vessels of the Prostate terminate chiefly in the hypogastric and sacral glands, but one trunk from the posterior surface ends in the external iliac glands, and another from the anterior surface joins the vessels which drain the membranous part of the urethra.

The Lymphatic Vessels of the Urethra.—The lymphatics of the cavernous portion of the urethra accompany those of the glans penis, and terminate with them in the deep subinguinal and external iliac glands. Those of the membranous and prostatic portions, and those of the whole urethra in the female, pass to the hypogastric glands.

PHYSIOLOGY OF URINARY SYSTEM



INTRODUCTION

The Urinary System is a group of organs in the body concerned with filtering out excess fluid and other substances from the bloodstream. The substances are filtered out from the body in the form of urine. Urine is a liquid produced by the kidneys, collected in the bladder and excreted through the urethra. Urine is used to extract excess minerals or vitamins as well as blood corpuscles from the body. The Urinary system works with the other systems of the body to help maintain homeostasis. The kidneys are the main organs of homeostasis because they maintain the acid base balance and the water salt balance of the blood.

FUNCTIONS OF THE URINARY SYSTEM

One of the major functions of the Urinary system is the process of excretion. Excretion is the process of eliminating, from an organism, waste products of metabolism and other materials that are of no use. The urinary system maintains an appropriate fluid volume by regulating the amount of water that is excreted in the urine. Other aspects of its function include regulating the concentrations of various electrolytes in the body fluids and maintaining normal pH of the blood. Several body organs carry out excretion, but the kidneys are the most important excretory organ. The renal arteries carry a large portion of the total blood flow to the kidneys. Up to a third of the total cardiac output can pass through the renal arteries to be filtered by the kidneys.The primary function of the kidneys are to maintain a stable internal environment (homeostasis) for optimal cell and tissue metabolism. They do this by separating urea, mineral salts, toxins, and other waste products from the blood. They also do the job of conserving water, salts, and electrolytes. At least one kidney must function properly for life to be maintained.The structural and functional unit of kidney is nephron.

KIDNEYS

Regulation of plasma ionic composition. Ions such as sodium, potassium, calcium, magnesium, chloride, bicarbonate, and phosphates are regulated by the amount that the kidney excretes.

Regulation of plasma osmolarity. The kidneys regulate osmolarity because they have direct control over how many ions and how much water a person excretes.

Regulation of plasma volume. Our kidneys are so important they even have an effect on our blood pressure. The kidneys control plasma volume by controlling how much water a person excretes. The plasma volume has a direct effect on the total blood volume, which has a direct effect on your blood pressure. Salts such as NaCI can cause osmosis, the diffusion of water into the blood. Natriuretic Hormone released from cardiocyte granules located in the right atria of the heart in response to increased atrial stretch. It inhibits ADH secretions which can contribute to the loss of sodium and water.

Regulation of plasma hydrogen ion concentration (pH). The kidneys partner up with the lungs and they together control the pH. The kidneys have a major role because they control the amount of bicarbonate excreted or held onto. The kidneys help maintain the blood Ph mainly by excreting hydrogen ions and reabsorbing bicarbonate ions as needed.

Removal of metabolic waste products and foreign substances from the plasma. One of the most important things the kidneys excrete is nitrogenous waste. As the liver breaks down amino acids it also releases ammonia. The liver then quickly combines that ammonia with carbon dioxide, creating urea which is the primary nitrogenous end product of metabolism in

humans. The liver turns the ammonia into urea because it is much less toxic. We can also excrete some ammonia, creatinine and uric acid. The creatinine comes from the metabolic breakdown of creatine phospate (a high-energy phosphate in muscles). Uric acid comes from the break down of necloetides. Uric acid is insoluble and too much uric acid in the blood will build up and form crystals that can collect in the joints and cause gout.

Secretion of Hormones. The endocrine system has assistance from the kidneys when releasing hormones. Renin is released by the kidneys. Renin leads to the secretion of aldosterone which is released from the adrenal cortex. Aldosterone promotes the kidneys to reabsorb the sodium (Na+) ions. The kidneys also secrete erythropoietin in response to decreased tissue oxygen levels (hypoxia). Erythropoietin stimulates red blood cell production. The Vitamin D from the skin is also activated with help from the kidneys. Calcium (Ca+) absorption from the digestive tract is promoted by vitamin D. The prostaglandins secreted from the kidney are PGA2 and PGE2. The renal kinins convert alpha2 globulin into bradykinin in the presence of enzyme Kallikrein.

Nephrons

It's chief function is to regulate water and soluble substances by filtering the blood, reabsorbing what is needed and excreting the rest as urine. Nephrons eliminate wastes from the body, regulate blood volume and pressure, control levels of electrolytes and metabolites, and regulate blood pH. Its functions are vital to life and are regulated by the endocrine system by hormones such as antidiuretic hormone, aldosterone, and parathyroid hormone.Each nephron has its own supply of blood from two capillary regions from the renal artery. The renal corpuscle filters out large solutes from the blood, delivering water and small solutes to the renal tubule for modification.

Glomerulus - The glomerulus is a capillary tuft that receives its blood supply from an afferent arteriole of the renal circulation. The glomerular blood pressure provides the driving force for fluid and solutes to be filtered out of the blood and into the space made by Bowman's capsule. The remainder of the blood not filtered into the glomerulus passes into the narrower efferent arteriole. It then moves into the vasa recta, which are collecting capillaries intertwined with the convoluted tubules through the interstitial space, where the reabsorbed substances will also enter. This then combines with efferent venules from other nephrons into the renal vein, and rejoins with the main bloodstream.

Afferent/Efferent Arterioles - The afferent arteriole supplies blood to the glomerulus. A group of specialized cells known as juxtaglomerular cells are located around the afferent arteriole where it enters the renal corpuscle. The efferent arteriole drains the glomerulus. Between the two arterioles lies specialized cells called the macula densa. The juxtaglomerular cells and the macula densa collectively form the juxtaglomerular apparatus. It is in the juxtaglomerular apparatus cells that the enzyme renin is formed and stored. Renin is released in response to decreased blood pressure in the afferent arterioles, decreased sodium chloride in the distal convoluted tubule and sympathetic nerve stimulation of receptors (beta-adrenic) on the juxtaglomerular cells. Renin is needed to form Angiotensin I and Angiotensin II which stimulate the secretion of aldosterone by the adrenal cortex.

Glomerular Capsule or Bowman's Capsule - Bowman's capsule (also called the glomerular capsule) surrounds the glomerulus and is composed of visceral (simple squamous epithelial cells) (inner) and parietal (simple squamous epithelial cells) (outer) layers. The visceral layer lies just beneath the thickened glomerular basement membrane and is made of podocytes which send foot processes over the length of the glomerulus. Foot processes

interdigitate with one another forming filtration slits that, in contrast to those in the glomeruluar endothelium, are spanned by diaphragms. The size of the filtration slits restricts the passage of large molecules (eg, albumin) and cells (eg, red blood cells and platelets). In addition, foot processes have a negatively-charged coat (glycocalyx) that limits the filtration of negatively-charged molecules, such as albumin. This action is called electrostatic repulsion.

The parietal layer of Bowman's capsule is lined by a single layer of squamous epithelium. Between the visceral and parietal layers is Bowman's space, into which the filtrate enters after passing through the podocytes' filtration slits. It is here that smooth muscle cells and macrophages lie between the capillaries and provide support for them. Unlike the visceral layer, the parietal layer does not function in filtration. Rather, the filtration barrier is formed by three components: the diaphragms of the filtration slits, the thick glomerular basement membrane, and the glycocalyx secreted by podocytes. 99% of glomerular filtrate will ultimately be reabsorbed.

The process of filtration of the blood in the Bowman's capsule is ultrafiltration (or glomerular filtration), and the normal rate of filtration is 125 ml/min, equivalent to ten times the blood volume daily. Measuring the glomerular filtration rate (GFR) is a diagnostic test of kidney function. A decreased GFR may be a sign of renal failure. Conditions that can effect GFR include: arterial pressure, afferent arteriole constriction, efferent arteriole constriction, plasma protein concentration and colloid osmotic pressure.

Any proteins that are roughly 30 kilodaltons or under can pass freely through the membrane. Although, there is some extra hindrance for negatively charged molecules due to the negative charge of the basement membrane and the podocytes. Any small molecules such as water, glucose, salt (NaCl), amino acids, and urea pass freely into Bowman's space, but cells,

platelets and large proteins do not. As a result, the filtrate leaving the Bowman's capsule is very similar to blood plasma in composition as it passes into the proximal convoluted tubule. Together, the glomerulus and Bowman's capsule are called the renal corpuscle.

Proximal Convoluted Tubule (PCT) - The proximal tubule can be anatomically divided into two segments: the proximal convoluted tubule and the proximal straight tubule. The proximal convoluted tubule can be divided further into S1 and S2 segments based on the histological appearance of it's cells. Following this naming convention, the proximal straight tubule is commonly called the S3 segment. The proximal convoluted tubule has one layer of cuboidal cells in the lumen. This is the only place in the nephron that contains cuboidal cells. These cells are covered with millions of microvilli. The microvilli serve to increase surface area for reabsorption.

Fluid in the filtrate entering the proximal convoluted tubule is reabsorbed into the peritubular capillaries, including approximately two-thirds of the filtered salt and water and all filtered organic solutes (primarily glucose and amino acids). This is driven by sodium transport from the lumen into the blood by the Na+/K+ ATPase in the basolateral membrane of the epithelial cells. Much of the mass movement of water and solutes occurs in between the cells through the tight junctions, which in this case are not selective.

The solutes are absorbed isotonically, in that the osmotic potential of the fluid leaving the proximal tubule is the same as that of the initial glomerular filtrate. However, glucose, amino acids, inorganic phosphate, and some other solutes are reabsorbed via secondary active transport through cotransport channels driven by the sodium gradient out of the nephron.

The Nephron Loop or Loop of Henle - The loop of Henle begins in the cortex, receiving filtrate from the proximal convoluted tubule, extends into the medulla, and then returns to the cortex to empty into the distal convoluted tubule. Its primary role is to concentrate the salt in the interstitium, the tissue surrounding the loop.

Descending limb

It's descending limb is permeable to water but completely impermeable to salt, and thus only indirectly contributes to the concentration of the interstitium. As the filtrate descends deeper into the hypertonic interstitium of the renal medulla, water flows freely out of the descending limb by osmosis until the tonicity of the filtrate and interstitium equilibrate. Longer descending limbs allow more time for water to flow out of the filtrate, so longer limbs make the filtrate more hypertonic than shorter limbs.

Ascending limb

Unlike the descending limb, the ascending limb of Henle's loop is impermeable to water, a critical feature of the countercurrent exchange mechanism employed by the loop. The ascending limb actively pumps sodium out of the filtrate, generating the hypertonic interstitium that drives countercurrent exchange. In passing through the ascending limb, the filtrate grows hypotonic since it has lost much of its sodium content. This hypotonic filtrate is passed to the distal convoluted tubule in the renal cortex.

Distal Convoluted Tubule (DCT)

The distal convoluted tubule is similar to the proximal convoluted tubule in structure and function. Cells lining the tubule have numerous mitochondria, enabling active transport to take place by the energy supplied by ATP. Much of the ion transport taking place in the distal convoluted tubule is regulated by the endocrine system. In the presence of parathyroid hormone, the distal convoluted tubule

reabsorbs more calcium and excretes more phosphate. When aldosterone is present, more sodium is reabsorbed and more potassium excreted. Atrial natriuretic peptide causes the distal convoluted tubule to excrete more sodium. In addition, the tubule also secretes hydrogen and ammonium to regulate pH. After traveling the length of the distal convoluted tubule, only 3% of water remains, and the remaining salt content is negligible. 97.9% of the water in the glomerular filtrate enters the convoluted tubules and collecting ducts by osmosis.

Collecting ducts

Each distal convoluted tubule delivers its filtrate to a system of collecting ducts, the first segment of which is the connecting tubule. The collecting duct system begins in the renal cortex and extends deep into the medulla. As the urine travels down the collecting duct system, it passes by the medullary interstitium which has a high sodium concentration as a result of the loop of Henle's countercurrent multiplier system. Though the collecting duct is normally impermeable to water, it becomes permeable in the presence of antidiuretic hormone (ADH). As much as three-fourths of the water from urine can be reabsorbed as it leaves the collecting duct by osmosis. Thus the levels of ADH determine whether urine will be concentrated or dilute. Dehydration results in an increase in ADH, while water sufficiency results in low ADH allowing for diluted urine. Lower portions of the collecting duct are also permeable to urea, allowing some of it to enter the medulla of the kidney, thus maintaining its high ion concentration (which is very important for the nephron).

Urine leaves the medullary collecting ducts through the renal papilla, emptying into the renal calyces, the renal pelvis, and finally into the bladder via the ureter. Because it has a different embryonic origin than the rest of

the nephron (the collecting duct is from endoderm whereas the nephron is from mesoderm), the collecting duct is usually not considered a part of the nephron proper.

URETERS

Muscles in the walls of the ureters send the urine in small spurts into the bladder, (a collapsible sac found on the forward part of the cavity of the bony pelvis that allows temporary storage of urine). After the urine enters the bladder from the ureters, small folds in the bladder mucosa act like valves peventing backward flow of the urine. The outlet of the bladder is controlled by a sphincter muscle. A full bladder stimulates sensory nerves in the bladder wall that relax the sphincter and allow release of the urine. However, relaxation of the sphincter is also in part a learned response under voluntary control. The released urine enters the urethra.

URINARY BLADDER

The urinary bladder can hold approximately 17 to 18 ounces (500 to 530 ml) of urine, however the desire to micturate is usually experienced when it contains about 150 to 200 ml. When the bladder fills with urine (about half full), stretch receptors send nerve impulses to the spinal cord, which then sends a reflex nerve impulse back to the sphincter (muscular valve) at the neck of the bladder, causing it to relax and allow the flow of urine into the urethra. The Internal urethral sphincter is involuntary. The ureters enter the bladder diagonally from its dorsolateral floor in an area called the trigone. The trigone is a triangular shaped area on the postero-inferior wall of the bladder. The urethra exits at the lowest point of the triangle of the trigone. The urine in the bladder also helps regulate body temperature. If the bladder becomes completely void of fluid, it causes the patient to chill.

URETHRA

The function of the urethra is to remove urine from the body. Because the urethra is so much shorter in a woman it makes it much easier for a woman to get harmful bacteria in her bladder this is commonly called a bladder infection or a UTI. The most common bacteria of a UTI is E-coli from the large intestines that have been excreted in fecal matter.The length of a male's urethra, and the fact it contains a number of bends, makes catheterisation more difficult.

The urethral sphincter is a collective name for the muscles used to control the flow of urine from the urinary bladder. These muscles surround the urethra, so that when they contract, the urethra is closed.

- There are two distinct areas of muscle: the internal sphincter, at the bladder neck and
- the external, or distal, sphincter.

Human males have much stronger sphincter muscles than females, meaning that they can retain a large amount of urine for twice as long, as much as 800mL, i.e. "hold it".

FORMATION OF URINE

Urine is formed in three steps: Filtration, Reabsorption, and Secretion.

Filtration

Blood enters the afferent arteriole and flows into the glomerulus. Blood in the glomerulus has both filterable blood components and non-filterable blood components. Filterable blood components move toward the inside of the glomerulus while non-filterable blood components bypass the filtration process by exiting through the efferent arteriole. Filterable Blood components now take on plasma like form called glomerular filtrate. A few of the filterable blood components are water, nitrogenous waste, nutrients and salts (ions).

Nonfilterable blood components include formed elements such as blood cells and platelets along with plasma proteins. The glomerular filtrate is not the same consistency as urine, as much of it is reabsorbed into the blood as the filtrate passes through the tubules of the nephron.

Reabsorption

Within the peritubular capillary network, molecules and ions are reabsorbed back into the blood. Sodium Chloride reabsorbed into the system increases the osmolarity of blood in comparison to the glomerular filtrate. This reabsorption process allows water (H_2O) to pass from the glomerular filtrate back into the circulatory system.

Glucose and various amino acids also are reabsorbed into the circulatory system. These nutrients have carrier molecules that claim the glomerular molecule and release it back into the circulatory system. If all of the carrier molecules are used up, excess glucose or amino acids are set free into the urine. A complication of diabetes is the inability of the body to reabsorb glucose. If too much glucose appears in the glomerular filtrate it increases the osmolarity of the filtrate, causing water to be released into the urine rather than reabsorbed by the circulatory system. Frequent urination and unexplained thirst are warning signs of diabetes, due to water not being reabsorbed.

Glomerular filtrate has now been separated into two forms: Reabsorbed Filtrate and Non-reabsorbed Filtrate. Non-reabsorbed filtrate is now known as tubular fluid as it passes through the collecting duct to be processed into urine.

Secretion

Some substances are removed from blood through the peritubular capillary network into the distal convoluted tubule or collecting duct. These substances are Hydrogen ions, creatinine, and drugs. Urine is a collection of substances that have not been reabsorbed during glomerular filtration or tubular secretion.

Maintaining Water-Salt Balance

It is the job of the kidneys to maintain the water-salt balance of the blood. They also maintain blood volume as well as blood pressure. Simple examples of ways that this balance can be changed include ingestion of water, dehydration, blood loss and salt ingestion.

Reabsorption of water

Direct control of water excretion in the kidneys is exercised by the anti-diuretic hormone (ADH), released by the posterior lobe of the pituitary gland. ADH causes the insertion of water channels into the membranes of cells lining the collecting ducts, allowing water reabsorption to occur. Without ADH, little water is reabsorbed in the collecting ducts and dilute urine is excreted. There are several factors that influence the secretion of ADH. The first of these happen when the blood plasma gets too concentrated. When this occurs, special receptors in the hypothalamus release ADH. When blood pressure falls, stretch receptors in the aorta and carotid arteries stimulate ADH secretion to increase volume of the blood.

Reabsorption of Salt

The Kidneys also regulate the salt balance in the blood by controlling the excretion and the reabsorption of various ions. As noted above, ADH plays a role in increasing water reabsorption in the kidneys, thus helping to dilute bodily fluids. The kidneys also have a regulated mechanism for reabsorbing sodium in the distal nephron. This mechanism is controlled by

aldosterone, a steroid hormone produced by the adrenal cortex. Aldosterone promotes the excretion of potassium ions and the reabsorption of sodium ions. The release of Aldosterone is initiated by the kidneys. The juxtaglomerular apparatus is a renal structure consisting of the macula densa, mesangial cells, and juxtaglomerular cells. Juxtaglomerular cells (JG cells, also known as granular cells) are the site of renin secretion. Renin is an enzyme that angiotensinogen (a large plasma protein produced by the liver) into Angiotensin I and eventually into Angiotensin II which stimulates the adrenal cortex to produce aldosterone. The reabsorption of sodium ions is followed by the reapsorption of water. This causes blood pressure as well as blood volume to increase.

Atrial natriuretic hormone (ANH) is released by the atria of the heart when cardiac cells are streatched due to increased blood volume. ANH inhibits the secretion of renin by the juxtaglomerular apparatus and the secretion of the aldosterone by the adrenal cortex. This promotes the excretion of sodium. When sodium is excreted so is water. This causes blood pressure and volume to decrease.

UROLITHIASIS

I. GENERAL CONCEPT

Urolithiasis is a condition of forming stones in the urinary tract. The stones are solid accretions (crystals) of dissolved minerals in urine. They vary in size from as small as a grain of sand to as large as a golf ball. Kidney stones typically leave the body in the urine stream; if they grow relatively large before passing (on the order of millimeters), obstruction of a ureter and distention with urine can cause severe pain most commonly felt in the flank, lower abdomen and groin.

INTRODUCTION

Kidney stones are an ancient affliction dating back to the age of the Egyptian pyramids, yet they are still a common disorder today. The incidence of kidney stones has been increasing in recent decades. Kidney stones occur in 1 in 20 people at some time in their life. Although the reasons for this are still unclear, many experts believe that diet choices and lack of fluids are important factors that have contributed to this increase. In recent years, technological advancements have greatly facilitated the diagnosis of stone disease. Physicians can now conclusively identify and, perhaps more importantly, exclude stone disease within minutes of considering the diagnosis. The management of urolithiasis is also becoming increasingly well defined. Clear indications for urologic referral are based on a recognition of the few urgent situations and a solid understanding of the natural history of stone progression.

The development of the stones is related to decreased urine volume or increased excretion of stone-forming components such as calcium, oxalate, urate, cystine, xanthine, and phosphate, thereby the urine becomes too concentrated. This causes minerals and other substances in the urine to form

crystals on the inner surfaces of kidneys. Over time, these crystals may combine to form a small, hard mass, or stone. Under normal circumstances, the urine contains substances that prevent crystallization but for patients with this condition, these inhibitory substances are ineffective.The stones form in the urine collecting area (the pelvis) of the kidney and may range in size from tiny to staghorn stones, the size of the renal pelvis itself.

All kidney stones donot cause symptoms. They're often discovered when X-rays are taken for an unrelated condition or when one seek medical care for other problems, such as blood in urine or recurrent urinary tract infections. Most small kidney stones pass into the bladder without causing any permanent damage. Still, it's important to determine the underlying cause to prevent the recurrence in the future. In many cases, one can prevent kidney stones simply by drinking more water and making a few dietary changes. Most kidney stones pass out of the body without being noticed. But sometimes a stone will not go away. It may get stuck in the urinary tract, block the flow of urine and cause one of the most severe pain. The primary complications of urolithiasis include obstruction of urinary tract, renal parenchymal damage, infection, and adverse effects of medication or diet.

EPIDEMIOLOGY

Men are affected by renal stones more commonly than women. The male-to-female ratio is approximately 3:1. It occurs commonly between 30-50 years of age. It is mostly found in persons whose diet is low in vitamins. Approximately 80-85 per cent of stones pass spontaneously without any mortality. Its recurrence is likely to occur if it is left without treatment. Epidemiology of nephrolithiasis varies according to the geographical area & socio – economic conditions. The disease was very much commoner in the males than in females.

URINARY STONE PHOTOGRAPHS

Component: Calcium Oxalate Monohydrate stones.

TYPES OF RENAL CALCULI

STONE ANALYSIS – Stones which are passed spontaneously should be saved for analysis of its type and composition. Chemical analysis of a calculus

passed in the urine or removed surgically is very helpful in identifying the underlying causative factor and aid in getting relief from recurrences. But in case of lithotripsy, renal stones get fragmented, and a whole stone is not available for analysis.

Basically the renal stones can be divided into two major groups

I. Primary stones

II. Secondary stones.

I. Primary Stones

They appear in apparently healthy urinary tract without any antecedent inflammation. They are stones, which are formed through the tendencies.

a. Calcium oxalate
b. Uric acid calculi
c. Cystine calculi
d. Xanthine calculi
e. Indigo calculi

II. Secondary Stones

They are usually formed as the result of inflammation. The stones formed due to vitamin A deficiency also come under this category.

a. Triple phosphate calculus
b. Mixed stones

Calcium salts, uric acid, cystine, and struvite ($MgNH_4PO_4$) are the basic constituents of most kidney stones in the western hemisphere.

CALCIUM STONES - Of the four main types of urinary stones, calcium stones are the most common. The calcium may combine with other substances such as oxalate, phosphate or carbonate to form the stone. Any increased levels of calcium and oxalates will increase the tendency to stone formation. This type

of stone is extremely hard with surface rough with spicules. It is dark in colour, usually single and radio-opaque. It usually arises in acid urine.

Calcium stones are more common in men; the average age of onset is the third decade. Approximately 60% of people who form a single calcium stone eventually form another within the next 10 years. The average rate of new stone formation in patients who have had a previous stone is about one stone every 2 or 3 years. Calcium stone disease is frequently familial. Calcium oxalate and calcium phosphate stones make up 75 to 85% of the total and may be admixed in the same stone.

Calcium phosphate in stones is usually hydroxyapatite [$Ca_5(PO_4)_3OH$] or, less commonly, brushite ($CaHPO_4.H_2O$). The toxicity of oxalate in humans results from the extreme insolubility of its calcium salt or calcium oxalate, which may precipitate in the renal parenchyma or renal tract, causing either nephrocalcinosis or stones. Diseases of the small intestine increase the tendency to form calcium oxalate stones. These stones are dark brown in colour. In the urine, calcium oxalate monohydrate crystals (whewellite) usually grow as biconcave ovals that resemble red blood cells in shape and size but may occur in a larger, "dumbbell" form. In polarized light the crystals appear bright against a dark background, with an intensity that is dependent on orientation, a property known as birefringence. Calcium oxalate dihydrate crystals (weddellite) are bipyramidal. Apatite crystals do not exhibit birefringence and appear amorphous because the actual crystals are too small to be resolved by light microscopy.

Uric acid stones are radiolucent and are also more common in men. Half of patients with uric acid stones have gout; uric acid lithiasis is usually familial whether or not gout is present. . Reduced urine volume with dehydration, hyperuricaemia, and a urinary PH that is consistently less than

6 are the important factors that influence uric acid stone formation. These types of stones are usually multiple, moderately hard, easily broken and not radio-opaque. They are brownish white in colour and usually occur in acid urine. In urine, uric acid crystals are red-orange in color because they absorb the pigment uricine. Anhydrous uric acid produces small crystals that appear amorphous by light microscopy. They are indistinguishable from apatite crystals, except for their birefringence. Uric acid dihydrate tends to form teardrop-shaped crystals as well as flat, rhomboid plates; both are strongly birefringent. Uric acid gravel appears like red dust, and the stones are also orange or red on some occasions.

CYSTINE STONES - This is a rare type of kidney stone that occurs in children of all ages due to genetic condition. Urine becomes supersaturated with cystine resulting in crystal deposition. Cystine stones are lemon yellow, and sparkle; radiopacity is due to the sulfur content. Cystine crystals appear in the urine as flat, hexagonal plates. Cystine stones are pink or yellow in colour and are soft stones.

XANTHINE STONES - Occur in the rare condition of Xanthinuria, which is also an inherited genetic condition. Xanthine is usually converted into uric acid. So, its diagnosis is made by low-level of uric acid. It is smooth, round, brick red/orange sediment in the urine of children.

PHOSPHATES STONES - These types of stones are smooth and chalky with tendency to easily break. It is dirty white in colour and radio-opaque. It usually arises in alkaline urine which is favourable for infectious diseases. In this alkaline condition it grows enormously and takes the form of pelvic calyceal system assuming the shape of stag-horn. Stones are frequently diagnosed in children and women who have recurrent urinary tract infection. They can grow very large and obstruct the kidney, urethra, or bladder. A

urine PH greater than 7 suggests presence of urea-splitting organisms, such as Proteus, Pseudomonas, or Klebsiella species, and struvite stone.

STRUVITE STONES - They are common and potentially dangerous. These stones occur mainly in women or patients who require chronic bladder catheterization and result from urinary tract infection with urease-producing bacteria, usually Proteus species. The stones can grow to a large size and fill the renal pelvis and calyces to produce a "staghorn" appearance. They are radiopaque and have a variable internal density. In urine, struvite crystals are rectangular prisms said to resemble coffin lids. Infection stones consist of magnesium ammonium phosphate (Struvite) with varying admixtures of calcium phosphate (apatite). In general, Struvite stones may partially dissolve in the presence of sterile urine, so long term low-dose treatment with antibiotics is appropriate even when urine culture is initially sterile.

AETIOLOGY

1. Hyperexcretion of relatively insoluble urinary constituents such as oxalates, calcium, uric acid, cystine and certain drugs (such as magnesium trisilicate in the treatment of peptic ulcer).

2. Physiological changes in urine such as urinary pH (which is influenced by diet and medicines), colloid content, decreased concentration of crystalloids, urinary magnesium/calcium ratio.

3. Altered urinary crystalloids and colloids:- Either from an increase in the crystalloid level or from a fall in the colloid level, urinary stones may be formed. If there is any modification of the colloids e.g., if they lose their solvent action or adhesive property, urinary stones may develop.

4. Decreased urinary output of citrate:- When potassium levels fall too low, urine citrate also drops, decreasing your protection against stones.

5. Vitamin A deficiency:- The desquamated cells form nidus for stone formation. This is more applicable to bladder stones.

6. Urinary infection:- Infection disturbs the colloid content of the urine, also causes abnormality in the colloids (which may cause the crystalloid to be precipitated). Infection also changes urinary pH and also causes increase in concentration of crystalloids.

7. Urinary stasis:- It causes a shift of the pH of the urine to the alkaline side, predisposes urinary infection, and allows the crystalloids to precipitate.

8. Hyperparathyroidism:- Due to overproduction of parathormone the bones become decalcified and calcium concentration in the urine is increased. This extra calcium may be deposited in the renal tubules or in the pelvis to form renal calculus.

9. Limited activity. One is more prone to develop kidney stones if bedridden or very sedentary for a long period of time. That's because limited activity can cause your bones to release more calcium.

10. Nidus of stone formation

Each of the four main types of kidney stones has different causes:

CALCIUM STONES- Roughly four out of five kidney stones are calcium stones. These stones are usually a combination of calcium and oxalate. Oxalate is a compound that occurs naturally in some fruits and vegetables. A number of factors can cause high concentrations of these substances in urine. Excess calcium, for instance, may result from ingesting large amounts of vitamin D, from treatment with thyroid hormones or certain diuretics, and from some cancers and kidney conditions. High levels of calcium occurs if parathyroid glands, which regulate calcium metabolism, are overactive (hyperparathyroidism). On the other hand, certain genetic factors, intestinal

bypass surgery and a diet high in oxalic acid may cause excess amounts of oxalate in the body. A lack of the protein calgranulin is blamed by some for the appearance of calcium oxalate stones.

STRUVITE STONES - Found more often in women than in men, struvite stones are almost always the result of chronic urinary tract infections caused by urea-splitting bacteria most commonly Proteus mirabilis (also Klebsiella, Serratia, Providencia species) that produce specific enzymes. These enzymes increase the amount of ammonia in the urine, which is incorporated in the crystals of struvite stones. These stones are often large, may have a characteristic stag's-horn shape and can seriously damage the kidneys.

URIC ACID STONES - These stones are formed of uric acid, a byproduct of protein metabolism. One who have undergone chemotherapy is more likely to develop uric acid stones. Some have eaten a high-protein diet or have certain genetic factors that predispose them to the condition. Gout (excess uric acid) is a common cause of kidney stones.

CYSTINE STONES - These stones represent only a small percentage of kidney stones. They form in people with a hereditary disorder that causes the kidneys to excrete excessive amounts of certain amino acids (cystinuria).

PREDISPOSING AND RISK FACTORS

A number of factors can cause changes in the urine, including the effects of heredity, diet, drugs, climate, lifestyle factors and certain medical conditions.

1. Age, sex and race. Most people who develop kidney stones are between 20 and 70 years of age. Men are more likely to develop kidney stones than

are women. In addition, white Americans are at higher risk of kidney stones than are black Americans.

2. Environmental and dietary factors - Low urine volumes, High ambient temperatures, Low fluid intake, Diet, High protein intake, High sodium, Low calcium, High sodium excretion, High oxalate excretion, High urate excretion and Low citrate excretion.

3. Other medical conditions:- Hypercalcemia of any cause, Ileal disease or resection (leading to increased oxalate absorption and urinary excretion) and Renal tubular acidosis type I . Kidney stone formation can be a sign of sarcoidosis.

4. Congenital and inherited conditions:- Familial hypercalciuria, Medullary sponge kidney, Cystinuria, Renal tubular acidosis type I and Primary hyperoxaluria

5. Autoimmune (Ulcerative Colitis):- When the immune system triggers inflammation in other parts of the body because of ulcerative colitis, kidney stones may result. This influence is usually mild and stones may not be a problem once the colitis is treated.

PATHOGENESIS OF STONES

Urinary stones usually arise because of the breakdown of a delicate balance. The kidneys must conserve water, but they must excrete materials that have a low solubility. These two opposing requirements must be balanced during adaptation to diet, climate, and activity. The problem is mitigated to some extent by the fact that urine contains substances that inhibit crystallization of calcium salts and others that bind calcium in soluble complexes. These protective mechanisms are less than perfect. When the

urine becomes supersaturated with insoluble materials, because excretion rates are excessive and/or because water conservation is extreme, crystals form and may grow and aggregate to form a stone.

SUPERSATURATION

In a solution in equilibrium with crystals of calcium oxalate, the product of the chemical activities of the calcium and oxalate ions in the solution is termed the equilibrium solubility product. If crystals are removed, and if either calcium or oxalate ions are added to the solution, the activity product increases, but the solution may remain clear; no new crystals form. Such a solution is metastably supersaturated. If new calcium oxalate seed crystals are now added, they will grow in size. Ultimately, the activity product reaches a critical value at which a solid phase begins to develop spontaneously. This value is called the upper limit of metastability, or the formation product. Stone growth in the urinary tract requires a urine that, on average, is above the equilibrium solubility product. Excessive supersaturation is common in stone formation.

Calcium, oxalate, and phosphate form many stable soluble complexes among themselves and with other substances in urine, such as citrate. As a result, their free ion activities are below their chemical concentrations and can be measured only by indirect techniques. Reduction in ligands such as citrate can increase ion activity without changing total urinary calcium. Urine supersaturation can be increased by dehydration or by overexcretion of calcium, oxalate, phosphate, cystine, or uric acid. Urine pH is also important; phosphate and uric acid are weak acids that dissociate readily over the physiologic range of urine pH. Alkaline urine contains more dibasic phosphate, favoring deposits of brushite, and apatite. Below a urine pH of 5.5, uric acid crystals (pK 5.47) predominate, whereas phosphate crystals are rare. The solubility of calcium oxalate, on the other hand, is not

influenced by changes in urine pH. Measurements of supersaturation in a pooled 24-h urine sample probably underestimate the risk of precipitation. Transient dehydration, variation of urine pH, and postprandial bursts of overexcretion may cause values considerably above average.

NUCLEATION

Homogeneous Nucleation - In urine that is supersaturated with respect to calcium oxalate, these two ions form clusters. Most small clusters eventually disperse because the internal forces that hold them together are too weak to overcome the random tendency of ions to move away. Clusters of over 100 ions can remain stable because attractive forces balance surface losses. Once they are stable, nuclei can grow at levels of supersaturation below that needed for their creation. The formation product marks the point at which stable nuclei become frequent enough to create a permanent solid phase.

Heterogeneous Nucleation - If a supersaturated urine is seeded with preformed nuclei of a crystal that is similar in structure to calcium oxalate, calcium and oxalate ions in solution will bind to the crystal's surface as they would on a seed crystal of calcium oxalate itself. The seeding of a supersaturated solution by foreign nuclei is called heterogeneous nucleation. Cell debris, calcifications on the renal papillae, as well as other urinary crystals, can serve as heterogeneous nuclei that permit calcium oxalate stones to form, even though urine calcium oxalate supersaturation never exceeds the metastable limit for homogenous nucleation.

INHIBITORS OF CRYSTAL FORMATION

Stable nuclei must grow and aggregate to produce a stone of clinical significance. Urine contains potent inhibitors of nucleation, growth, and aggregation for calcium oxalate and calcium phosphate but not for uric acid, cystine, or struvite. Inorganic pyrophosphate is a potent inhibitor that appears to affect calcium phosphate more than calcium oxalate crystals. Citrate inhibits crystal growth and nucleation, though most of the stone inhibitory activity of citrate is due to lowering urine supersaturation via complexation of calcium. Other urine components such as glycoproteins inhibit all three processes of calcium oxalate stone formation. Slowing of crystal growth increases the apparent upper limit of metastability because the critical growth of ion clusters into stable nuclei is hindered. As a consequence of the presence of these inhibitors, crystal growth in urine is slow compared with growth in simple salt solutions, and the upper limit of metastability is higher.

CLINICAL FEATURES

SYMPTOMS

a. Quiescent calculus

b. Pain

- Fixed renal pain
- Ureteric colic
- Referred pain

c. Hydronephrosis (a lump in the loin and a dull ache)

d. Haematuria

e. Pyuria

Many stones are asymptomatic unless a kidney stone is large, causes a blockage, is associated with an infection or is being passed.. The main symptoms are:

Pain - The most common symptom of kidney stone is severe back or abdominal pain. The colicky-type of pain is the sudden onset of very severe

pain sub costally and it radiates interiorly and anteriorly towards the groin. The pain generated by renal colic is primarily caused by the dilation, stretching and spasm caused by the acute ureteral obstruction. As the stone moves lower, the pain may be felt in the genitals, especially the testicles in men and the labia in women. In infants, stone pain is often confused with colicky abdominal pain. Most of the calculi are originating within the kidney and proceed distally, creating various degrees of urinary obstruction as they become lodged in narrow areas, including the ureteropelvic junction, pelvic brim, and ureterovesical junction. Location and quality of pain are related to the position of the stone within the urinary tract. The severity of the pain depends on the degree and site of the obstruction and not on the size of the stone. Pain also varies in intensity with the presence of ureteral spasm and infection

a. If stones block in the ureteropelvic junction – pain will be severe with a deep back pain without radiation to the groin and due to distension of the renal capsule.

b. If stones block the upper urethra and renal pelvis - Pain will radiate from back to front misguiding to gall stones on right and peptic ulcer in left.

c. If stones block the middle urethra - pain will radiate anteriorly and suprapubically. This mid urethral pain usually misguides to appendicitis on the right.

d. If stones block the distal urethra - pain will radiate into the groin or testicle in the male or labia majora in the female. If a stone is lodged in the intramural urethra, symptoms may appear similar to cystitis or urethritis. These symptoms include suprapubic pain, urinary frequency, urgency, dysuria, stranguria, and pain at the tip of the penis.

e. If stones enter the bladder, pain is often switched off and stone gets circular or oval shape as it rolls inside the bladder and is passed easily during urination.

Nausea and vomiting with excessive sweating - This is due to the common nerve supply by vagus nerve to renal pelvis and bowels. This may also misguide the patients that it these are bowel disorders.

Urinary tract infection - Symptoms may include fever, chills, sweats and pain with urination. Kidney stones and urinary tract infection can cause block with urine retentions. Red blood cells and pus cells will be found in the urine. Also albumin, hyaline casts and crystals will be seen.

Fever – It is not a part of the presentation of uncomplicated nephrolithiasis. If fever is present, rule out hydronephrosis, pyonephrosis, or perinephric abscess. Such a condition is potentially life-threatening and should be treated as a surgical emergency.

EFFECTS OF STONE

The size and position of the stone usually govern the development of secondary pathologic changes in the urinary tract.

a. Same Kidney

- Obstruction.
- Infection
- The epithelium of the pelvis and calyces in relation to the stone gradually loses lustre, becomes rough and thickened. Parenchymal ischaemia may be caused by local pressure due to stone.
- Metaplasia

b. Opposite Kidney

- Compensatory hypertrophy
- Stone formation may be bilateral
- Infection of the opposite kidney
- Calculus anuria

OTHER SYNDROMES

Staghorn Calculi Struvite, cystine, and uric acid stones often grow too large to enter the ureter. They gradually fill the renal pelvis and may extend outward through the infundibula to the calyces themselves.

Nephrocalcinosis Calcium stones grow on the papillae. Most break loose and cause colic, but they may remain in place so that multiple papillary calcifications are found by x-ray, a condition termed nephrocalcinosis. Papillary nephrocalcinosis is common in hereditary distal renal tubular acidosis (RTA) and in other types of severe hypercalciuria. In medullary sponge kidney disease calcification may occur in dilated distal collecting ducts.

Sludge Sufficient uric acid or cystine in the urine may plug both ureters with precipitate. Calcium oxalate crystals do not do this because less than 100 mg oxalate usually is excreted daily in the urine even in severe hyperoxaluric states, compared with 1000 mg uric acid in patients with hyperuricosuria and 400 to 800 mg cystine in patients with cystinuria. Calcium phosphate crystals can render the urine milky but do not plug the urinary tract.

INFECTION

Although urinary tract infection is not a direct consequence of stone disease, it can occur after instrumentation and surgery of the urinary tract, which are frequent in the treatment of stone disease. Stone disease and urinary tract infection can enhance their respective seriousness and interfere with treatment. Obstruction of an infected kidney by a stone may lead to sepsis and extensive damage of renal tissue, since it converts the urinary tract proximal to the obstruction into a closed, or partially closed, space that can become an abscess. Stones may harbor bacteria in the stone matrix, leading to recurrent urinary tract infection. On the other hand, infection due to bacteria that possess the enzyme urease can cause stones composed of struvite.

ACTIVITY OF STONE DISEASE

Active disease means that new stones are forming or that preformed stones are growing. Sequential radiographs of the renal areas are needed to document the growth or appearance of new stones and to ensure that passed stones are actually newly formed, not preexistent ones.

SIGNS

The classic patient with renal colic is writhing in pain, pacing about, and unable to lie still, in contrast to a patient with peritoneal irritation, who remains motionless to minimize discomfort.

Fever is not part of the presentation of uncomplicated nephrolithiasis. If present, suspect infected hydronephrosis, pyonephrosis, or perinephric abscess.

- Swelling in the flank when there is hydronephrosis or pyonephrosis associated with renal calculus.
- There may be tenderness at the 'renal angle' posteriorly and muscle rigidity over the kidney.
- The most common finding in ureterolithiasis is flank tenderness due to the dilation and spasm of the ureter from transient obstruction as the stone passes from the kidney to the bladder.
- Some may present with blood in urine. The bleeding may be caused by abrasion along the urinary tract as the stone travels.
- Abdominal examination usually is unremarkable. Bowel sounds may be hypoactive, a reflection of mild ileus, which is not uncommon in patients with severe, acute pain.
- Abdominal distension and diminished peristalsis may accompany ureteric colic
- In patients older than 60 years with no prior history of renal stones, the emergency physician should look carefully for physical signs of AAA (Abdominal Aorta Aneurysm)
- Testicles may be painful but should not be very tender and should appear normal.

COMPLICATIONS

1. Kidney damage and infection- Affected kidney can become functionless with hydronephrosis. If a stone stays inside one of the kidneys, it usually doesn't cause a problem unless it becomes so large when it blocks the flow of urine. This can cause pressure and pain, along with the risk of kidney damage, bleeding and infection. Smaller stones may partially block the thin tubes that connect each kidney to your bladder or the outlet from the bladder

itself. These stones may cause ongoing urinary tract infection or kidney damage if left untreated.

2. Recurrence of stones Recurrence may be classified into two varieties

- False recurrence :- Here, a tiny stone was overlooked at the time of operation

- True recurrence :- The various measures which should be adopted to prevent such recurrences are of two categories i) General measures and ii) special measures.

GENERAL MEASURES.

The general measures or advises which should be given to the patient regardless of the type of stone are:

- Fluid intake should he high at all times. Fluids should be taken at bed time so that nocturia will occur. This will prevent dehydration.
- Avoidance of milk, cheese and great deal of calcium should be advised. If renal function is satisfactory, sodium cellulose phosphate 5 g T.D.S. with meals should be prescribed to reduce calcium absorption.
- Urine should be kept acid all the time. Alkalies should be prohibited or used in lesser quantities in those patients who are suffering from peptic ulcer.
- Vitamin D should be stopped or used in very low quantity.
- Patients with hyperuricemia should avoid red meats, offal and fish, which are rich in purines, and should receive treatment with allopurinol.

- Eggs, meat and fish are high in sulphur containing proteins and should be restricted in patients with cystinuria.

The following investigations are appropriate in bilateral and recurrent stone formers:

- Serum calcium, measured fasting on three occasions to exclude hyperparathyroidism
- Serum uric acid
- Urinary urate, calcium and phosphate in a 24 hour collection. The urine should also be screened for cystine.
- Analysis of any stone passed.

SPECIFIC MEASURES

A. Calcium stone disease

(a) Non-idiopathic Calcium stone disease

- Specific treatmcnt of metabolic defect in calcium (e.g. hyperparathyroidism, increased vitamin D, sarcoidosis) or oxalate (primary hyperoxaluria or acquired disease secondary to enteric disorder).

(b) Idiopathic Calcium stone disease

- Low urinary volume, hypercalciuria, hyperoxaluria, hyperuricosuria .and hypocitraturia and low urinary magnesium are all responsible for stone formation.
- Fluid intake
- A low urinary volume will increase the risk of crystal formation. The aim should be to maintain the urine volume at least a minimum of 1.5 to 2 litres/day.
- Diet

- Western diet with increased intake of animal protein and carbohydrate is associated with increased urinary calcium, oxalate, phosphate and hypocitraturia compared with controls and thus represents a potent risk of stone formation. So patients should be advised to restrict this type of diet.
- Dietary intake of calcium should also be restricted. However it has been shown that calcium binds oxalate in the gut preventing its uptake, so low calcium intake will increase the amount of oxalate available for absorption creating an increased risk of oxalate crystallisation. So in mild hyperoxaluria, a high calcium diet is required, together with a diet avoiding oxalate-rich foods (e.g. tea and chocholate).
- A mega dose of vitamin C should be avoided.
- No excess stone risk has been shown related to dietary intake of sodium, sucrose or cola.
- Indomethacin 20 mg T.D.S. has been found to reduce calcium secretion. This may help in preventing further stone formation.

B. Infection stones

- Infection stones consist of magnesium ammonium phosphate (Struvite) with varying admixtures of calcium phosphate (apatite).
- In general, Struvite stones may partially dissolve in the presence of sterile urine, so long term low-dose treatment with antibiotics is appropriate even when urine culture is initially sterile.

C. Oxalate stones

- Foods high in oxalate should be eliminated from the diet. These are strawberrys, plums, spinach, asparagus etc. These may be used in low quantities or with milk or cream, in which case the oxalates are

precipitated as insoluble calcium salts in the intestine and are not absorbed.

- Pyridoxine in large doses may be helpful.
- Thiazides are useful agents which decrease both urinary calcium and oxalate.

D. Phosphate calculi

- Phosphates in the diet should also be restricted.
- Aluminium gel 40 ml T.D.S. and at bed time is also very useful to prevent the recurrence of phosphate calculi.

E. Uric acid calculi

- A low-purine diet should be prescribed for the uric acid stone former. Red meat, fish and liver are rich in purine.

F. Cystine calculi

- Sulphur containing proteins such as meat, fish and eggs should be restricted.
- Carbohydrates and fats may be increased in the diet along with low sulphur content proteins.
- Intake of fluids must be increased to dilute cystine in the urine.
- Fluid must be taken at night just before going to bed.
- Urine should be kept alkaline.
- Penicillamine may be prescribed to prevent recurrence of cystine calculi. This usually reduces the amount of cystine in the urine.
- Pyridoxine 50 mg daily should also be given. This not only ceases stone formation but it may also dissolve some stones.

DIAGNOSIS

The diagnosis of urinary tract calculi begins with a focused history. Key elements include past or family history of calculi, duration and evolution of symptoms, and signs or symptoms of sepsis. The physical examination is often more valuable for ruling out nonurologic disease. Renal calculi may be suspected based on the history and physical examination, but diagnostic imaging is essential to confirm or exclude the presence of urinary calculi.In the era of advanced ultrasound scanning, most renal stones (kidney stones) are diagnosed without any symptom.

INVESTIGATIONS

Urinalysis will identify PH, and microscopy will identify cystine crystals, haematuria, pyuria and bacteria. Also culture and sensitivity tests of urine will guide on the treatment to be followed. A 24-hour urine collection is necessary in evaluating renal stones. Microscopic haematuria is present in over 90 per cent of cases with stones.

The goals of imaging are to determine the presence of stones within the urinary tract, evaluate for complications, estimate the likelihood of stone passage, confirm stone passage, assess the stone burden, and evaluate disease activity.

When acute flank pain suggests the passage of a urinary stone, many methods of examination can be used. Often, conventional radiography is initially used to screen for stones, bowel abnormalities, or free intra-abdominal air. Radiographs can also be used to monitor the passage of visible stones.

IVU (excretory urography) provides important physiologic information regarding the degree of obstruction. Ultrasonography (US) is useful in young or pregnant patients and in patients allergic to iodinated contrast material. US is also helpful in problem solving.

All of these methods have become less useful with the advent of more sensitive and specific nonenhanced CT scanning. When CT is available, it is now considered the examination of choice for the detection and localization of urinary stones. Almost all studies conducted to date show that IVU provides no additional clinically important information after nonenhanced CT is performed. As a result of the higher radiation dose of CT, conventional or digital radiography should be used to monitor the passage of stones if radiographic follow-up studies are indicated and if the stone is visible on conventional radiographs.

X-RAY findings:

Conventional radiography

Conventional radiography is often performed as a preliminary examination in patients with abdominal pain possibly resulting from urinary calculi. These images should be obtained before contrast material is administered to prevent obscuring calcifications within the collecting system or calyceal diverticula. Conventional radiographs should include the entire urinary tract, and, often, 2 images are required.

- Stones are often found at key points of narrowing such as the UPJ, the ureterovesical junction (UVJ), and the point at which the ureter crossing the iliac vessels. An addition site is on the right side where the ureter passes through the root of the mesentery.
- Calcium stones as small as 1-2 mm can be seen. Cystine stones as small as 3-4 mm may be depicted, but uric acid stones are usually not seen unless they have become calcified.

- An erect or posterior oblique radiograph obtained on the side of the calcification may help in distinguishing urinary stones from extraurinary calcifications. This view can also depict calcifications that are projected over the sacrum or transverse processes on the frontal view.
- Preinjection renal tomography may depict additional stones, and it can be used to confirm the relationship of stones to the kidneys.
- Because stones are more visible with a lower peak kilovoltage (kVp), maintaining a maximum of 60-80 kVp is best, if possible. Larger patients may require a higher peak kilovoltage for acceptable exposure and scatter. In this situation, compression of the abdomen and collimation is critical.
- Mild bowel preparation may be helpful for increasing the sensitivity of conventional radiography for small stones in patients undergoing screening or follow-up observation for stones.
- Typically, phleboliths are round or oval, and they may demonstrate a central lucency. However, they are often difficult to distinguish from ureteral calculi. Phleboliths in the pelvis are usually located lower than and lateral to the ureter, but they overlap with the ureter. Because gonadal veins parallel the upper ureters, contrast enhancement may be needed to opacify the ureter and demonstrate the extraurinary location of phleboliths in the gonadal veins.

Intravenous urography

IVU is useful for confirming the exact location of a stone within the urinary tract. IVU depicts anatomic abnormalities such as dilated calyces, calyceal diverticula, duplication, UPJ obstruction, retrocaval ureter, and others that may predispose patients to stone formation or alter therapy. Because contrast agents can obscure stones in the collecting system, scouting the entire urinary tract prior to their administration is critical.

When an acute urinary stone is the primary consideration, compression may not be used to increase sensitivity for detection of low-grade obstruction. A caveat is that the contralateral kidney may have an abnormality that requires ureteric compression for adequate examination. In rare cases, the use of compression has been associated with forniceal rupture.

When a stone causes acute obstruction, an obstructive nephrogram may be present. This may be prolonged and hyperopaque, with increasing opacity over time. The nephrogram of acute obstruction is usually homogeneous, but may also be striated or occasionally not visible on radiographs.

Other signs include delayed excretion, dilatation to the point of obstruction, or blunting of the calyceal fornices. Immediately after the passage of a stone, residual mild obstruction or edema can be detected at the UVJ. Delayed images may be needed to opacify to the point of the obstruction, but using gravity to position the more opaque and more distal contrast material–laden-urine is also possible by placing the patient in a prone or erect position.

Extravasation of urine at the fornices may result in pyelosinus or pyelolymphatic extravasation, which is often first indicated by blurring of the calyceal fornices. Greater extravasation may outline the collecting system, and the contrast may dissect into the perinephric space; however, if the urine is not infected, this is usually clinically insignificant.

Degree of Confidence: Although 90% of urinary calculi are opaque on abdominal radiographs, the sensitivity for the prospective identification of individual stones is only 50-60%, and the specificity is only approximately

70%. Approximately 10% of stones are radiolucent on conventional radiographs.

False Positives/Negatives: Occasionally, false-positive findings result from extrarenal calcification, but these are usually correctly identified with IVU. Lucent stones appear as filling defects on IVU, but they are not distinguished from non–stone-filling defects such as transitional cell carcinomas or blood clots. US and CT are effective tools in making this distinction; however, much of the ureter cannot be visualized with US.

CT Scan

Findings: With a sensitivity of 94-97% and a specificity of 96-100%, helical CT is the most sensitive radiologic examination for the detection, localization, and characterization of urinary calcifications; therefore, helical CT is considerably more effective than IVU. Helical CT scans frequently depict non-obstructing stones that are missed on IVU. CT is faster and no contrast agent is needed in most patients. CT easily differentiates between non-opaque stones and blood clots or tumors (compared with IVU, which may depict only a filling defect). In addition, helical CT is better than US or IVU in detecting other causes of abdominal pain. In fact, in most studies, IVU added little or no information.

Rarely, pure matrix stones may demonstrate soft-tissue opacity on CT scans, and indinavir stones appear lucent. However, all other stones appear opaque on CT scans.

Technique

Because stones in the collecting system may be obscured by contrast material, no enhanced CT is usually performed. Helical CT is important to avoid missing stones because of section misregistration. A 5-mm helical

technique with a pitch of 1.5:1 or less is preferred, although some radiologists choose to use a pitch of as much as 2:1. The kidneys and, if possible, the entire abdomen should be scanned during a single breath hold to prevent section misregistration.

Because patients with stones are often young and because stone disease may recur, minimizing the radiation dose is critical. A fairly high level of noise as a result of the inherently high contrast levels is tolerable in most patients. Reported radiation doses for CT are 2.8-4.5 mSv compared with 1.3-1.5 mSv for a 3-image IVU. However, the uterine dose is approximately 0.006 Gy for 4-image IVU compared with 0.0046 Gy for nonenhanced CT.

At the authors institution, approximately 12% (10-20%) of patients who undergo nonenhanced CT for possible urinary stones receive intravenous contrast material for further evaluation. To discern between phleboliths and urinary stones, 50 mL of low-osmolar contrast agent should be administered. After 3-5 minutes, a 5-mm helical scan is obtained through the area of concern. Fewer contrast-enhanced studies are needed with increasing experience. Soft tissue around the rim of a calculus can differentiate it from a phlebolith. A phlebolith may have a comet tail of soft tissue extending from it; this finding differentiates it from a calculus. On CT scans, phleboliths do not have radiolucent centers, as often seen on plain radiographs.

When contrast-enhanced scans are required to evaluate pain not related to stones, routine abdominal and/or pelvic CT should be performed. In this situation, 100-150 mL of a low-osmolar oral and rectal contrast agent is used, and a 5-mm helical CT scan is obtained with a pitch of 1.5:1. Patient selection determines the number of examinations needed.

Stones at the UVJ may be difficult to distinguish from stones that have already passed into the bladder. If the distinction changes therapy, a repeat

scan through the UVJ in the prone position may be helpful. Stones that have already passed into the bladder will drop into a dependent location.

CT Findings

CT may depict the following:

- Stones in the ureter
- Enlarged kidneys
- Hydronephrosis (83% sensitive, 94% specific)
- Perinephric fluid (82% sensitive, 93% specific)
- Ureteral dilatation (90% sensitive, 93% specific)
- Soft-tissue rim sign (good positive predictive value with a positive odds ratio of 31:1)

The amount of perinephric fluid is correlated with the degree of obstruction seen on IVU, and as with the obstruction, the amount of fluid is correlated with the likelihood of stone passage. Normal hyperattenuating renal pyramids sometimes are seen. These indicate that significant obstruction is not present. However, this finding has been seen with proven ureteral calculi and is often absent in patients without stones. For this reason, the usefulness of IVU is limited. If contrast material is administered, a delayed or hyperattenuating nephrogram may also be visible on CT scans if the ureter has an obstruction.

Conventional radiography may be helpful in visualizing larger stones, once they are identified on CT scans, to provide a baseline to follow passage of the stone. If kidney, ureter, and bladder radiographs fail to depict the stone, CT may be needed to follow its passage. Approximately 40-55% of stones are not visible on abdominal radiographs. Almost no stones with attenuation values of less than 200 HU are visible, and repeat CT scans are usually required if passage of the stone is to be followed. Cystine and urate

stones have an attenuation of 100-500 HU; calcium stones usually demonstrate attenuation higher than 700 HU. Considerable overlap exists in the CT attenuation values of calcium stones.

Degree of Confidence: Individual CT signs are associated with varying degrees of confidence, as noted in CT findings above.

False Positives/Negatives: False-positive results are almost exclusively the result of a phlebolith adjacent to the ureter. False-negative results are primarily due to indinavir radiolucent stones and error. CT scans often suggest an alternative or additional diagnosis when renal stone disease is clinically suspected.

MRI

Findings: Stones are not directly visible on MRIs because they produce no signal. However, they may be indirectly visualized as a filling defect in the ureter or collecting system on heavily T2-weighted images or on gadolinium-enhanced T1-weighted images. MRI can be useful as a problem-solving tool if the use of iodinated contrast material or radiation is contraindicated (eg, during pregnancy).

Degree of Confidence: The degree of confidence remains to be determined.

False Positives/Negatives: False-positive and false-negative findings remain to be described.

ULTRASOUND

Findings: On sonograms, stones are demonstrated as bright echogenic foci with posterior acoustic shadowing. Stones are visualized fairly

well with US in the kidneys and the distal ureter at or near the UVJ, especially if dilatation is present. US is good for the visualization of complications such as hydronephrosis (or other signs of obstruction); however, some patients with acute obstruction have little or no dilation.

In particular, US is helpful in evaluating those with renal insufficiency or contraindications for the use of contrast media; however, US is often skipped in favor of nonenhanced CT.

In addition, US is good for characterizing lucent filling defects that are visualized as stones on IVU. However, US does not provide direct physiologic information regarding the degree of obstruction. Doppler imaging may demonstrate a high resistive index in acute obstruction, but this may not occur immediately or after forniceal rupture. Absence of the ureteral jet, as visualized with color Doppler on the symptomatic side, is presumptive evidence for a high-grade obstruction in a well-hydrated patient.

False Positives/Negatives: US is fairly specific when stones are seen, with a specificity as high as 90%. With US, matrix or indinavir stones may have soft tissue echogenicity without shadowing. False-positive findings may result from renal vascular calcifications. False-positive diagnoses of hydronephrosis also result from dilated vascular structures in the renal hilum. Doppler imaging is helpful in distinguishing dilated vascular structures from hydronephrosis.

NUCLEAR MEDICINE

Findings: Nuclear medicine studies may demonstrate the retention of activity in the cortex or collecting system when the obstruction is ongoing. Nuclear medicine tests are useful in determining differential renal function for

treatment planning and for assessing how much renal function might return after the obstruction is relieved. For example, a kidney with very little function might be removed if very little function persists after a trial of drainage. Occasionally, confirming the obstruction with nuclear medicine studies is useful if the administration of iodinated contrast material is contraindicated.

False Positives/Negatives: Renal function evaluation is not reliable in the presence of ongoing obstruction. Conversely, imaging findings may be normal with low-grade obstruction.

INTERVENTION

Intervention: Retrograde or antegrade pyeloureterography may be indicated if the collecting system cannot be opacified otherwise. This becomes much less useful as a diagnostic examination when CT is available. Retrograde stent placement is indicated if obstruction is present with proximal infection (pyonephrosis). Stent placement is performed to prevent sepsis and irreversible renal damage. If retrograde stent placement is unsuccessful, nephrostomy or antegrade stent placement serves as a reliable backup.

Limitations of Techniques: Because of the higher radiation dose with CT, conventional or digital radiography should be used to monitor the passage of stones if radiographic follow-up is believed to be indicated and if the stone is visible on conventional radiographs. Pregnant or pediatric patients may be imaged with US first to avoid radiation exposure. The rare false-negative finding is usually due to reader error or a protease-inhibitor CT-lucent stone. False-positive results are usually due to phleboliths adjacent to the ureter. In some cases, intravenous contrast material may be needed to opacify the ureter. It should be used mainly in patients who are young, those who are

pregnant, or those undergoing multiple examinations (eg, patients with spine injury).

IVU is the traditional examination for the assessment of urinary stone disease, and it does provide physiologic information related to the degree of obstruction. The radiation dose is generally smaller than that of CT, but it is of the same order of magnitude. Intravenous contrast is required, with resultant risks of an allergic reaction or nephrotoxicity. IVU is less sensitive than CT, especially for cases with small or non-obstructing calculi.

Differential diagnosis

AAA(Abdominal Aortic Aneurysm), Renal infarction, Urolithiasis, pyelonephritis, renal abscess, renal vein thrombosis, herpes zoster, radicular/ muscular pain, Appendicitis, Cholecystitis, Acute Cholelithiasis, Colon, Diverticulitis, Crohn Disease, Duodenum, Ulcers, Epididymitis, Gastric Ulcer, Gout, Meckel Diverticulum, Midgut Volvulus, Nephrocalcinosis, Obstructive Uropathy Acute, Ovarian Torsion, Ovarian Vein Thrombosis Pancreatitis, Acute Pancreatitis, Chronic Papillary Necrosis, Pelvic Inflammatory Disease/Tubo-ovarian Abscess, Renal Cell Carcinoma, Renal Vein Thrombosis, Retroperitoneal Fibrosis, Testicular Torsion, Transitional Cell Carcinoma, Tuberculosis, Genitourinary Tract, Ureterocele, Ureteropelvic Junction Obstruction, Congenital Vesicoureteral Reflux, Wilms Tumor, Xanthogranulomatous & Pyelonephritis

Other Problems to be considered

Blood clot, Fungus ball, Calcifications in tumors such as Complicated Renal cysts, Infection, Hematoma, Malakoplakia, Atherosclerotic calcification, Biliary colic, Ulcer disease & Diverticulitis

MANAGEMENT

Most kidney stones can pass through the urinary system with plenty of water (2 to 3 quarts a day) to help move the stone along. Often, one can stay home during this process, drinking fluids and taking pain medication as needed. The doctor usually asks to save the passed stone(s) for testing.

The First Step: Prevention

If you've had more than one kidney stone, you are likely to form another; so prevention is very important. To prevent stones from forming, your doctor must determine their cause. He or she will order laboratory tests, including urine and blood tests. Your doctor will also ask about your medical history, occupation, and eating habits. If a stone has been removed, or if you've passed a stone and saved it, the laboratory should analyze it because its composition helps in planning treatment.

You may be asked to collect your urine for 24 hours after a stone has passed or been removed. The sample is used to measure urine volume and levels of acidity, calcium, sodium, uric acid, oxalate, citrate, and creatinine (a product of muscle metabolism). Your doctor will use this information to determine the cause of the stone. A second 24-hour urine collection may be needed to determine whether the prescribed treatment is working.

Lifestyle Changes

A simple and most important lifestyle change to prevent stones is to drink more liquids—water is best. If you tend to form stones, you should try to drink enough liquids throughout the day to produce at least 2 quarts of urine in every 24-hour period.

People who form calcium stones used to be told to avoid dairy products and other foods with high calcium content. But recent studies have

shown that foods high in calcium, including dairy products, may help prevent calcium stones. Taking calcium in pill form, however, may increase the risk of developing stones.

You may be told to avoid food with added vitamin D and certain types of antacids that have a calcium base. If you have very acidic urine, you may need to eat less meat, fish, and poultry. These foods increase the amount of acid in the urine.

To prevent cystine stones, you should drink enough water each day to dilute the concentration of cystine that escapes into the urine, which may be difficult. More than a gallon of water may be needed every 24 hours, and a third of that must be drunk during the night.

Foods and Drinks Containing Oxalate

People prone to forming calcium oxalate stones may be asked by their doctor to cut back on certain foods if their urine contains an excess of oxalate:

- beet root
- chocolate
- coffee
- cola
- nuts
- rhubarb
- spinach
- strawberries
- tea
- wheat bran

People should not give up or avoid eating these foods without talking to their doctor first. In most cases, these foods can be eaten in limited amounts.

Medical Therapy

The doctor may prescribe certain medications to prevent calcium and uric acid stones. These drugs control the amount of acid or alkali in the urine, key factors in crystal formation. The drug allopurinol may also be useful in some cases of hyperuricosuria.

Doctors usually try to control hypercalciuria, and thus prevent calcium stones, by prescribing certain diuretics, such as hydrochlorothiazide. These drugs decrease the amount of calcium released by the kidneys into the urine by favoring calcium retention in bone. They work best when sodium intake is low.

Very rarely, patients with hypercalciuria may be given the drug sodium cellulose phosphate, which binds calcium in the intestines and prevents it from leaking into the urine.

If cystine stones cannot be controlled by drinking more fluids, your doctor may prescribe drugs such as Thiola and Cuprimine, which help reduce the amount of cystine in the urine.

For struvite stones that have been totally removed, the first line of prevention is to keep the urine free of bacteria that can cause infection. Your urine will be tested regularly to be sure that no bacteria are present.

If struvite stones cannot be removed, your doctor may prescribe a drug called acetohydroxamic acid (AHA). AHA is used with long-term antibiotic drugs to prevent the infection that leads to stone growth.

People with hyperparathyroidism sometimes develop calcium stones. Treatment in these cases is usually surgery to remove the parathyroid glands (located in the neck). In most cases, only one of the glands is enlarged. Removing the glands cures the patient's problem with hyperparathyroidism and with kidney stones as well.

Surgical Treatment

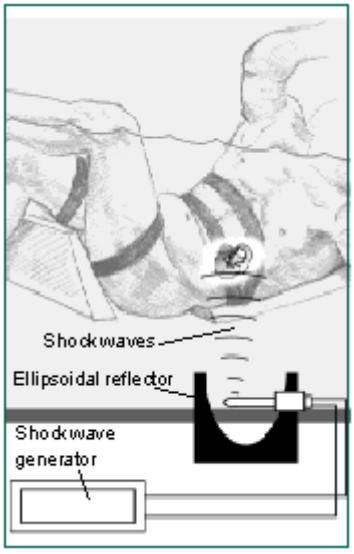
Surgery should be reserved as an option for cases where other approaches have failed. Surgery may be needed to remove a kidney stone if it

- does not pass after a reasonable period of time and causes constant pain
- is too large to pass on its own or is caught in a difficult place
- blocks the flow of urine
- causes ongoing urinary tract infection
- damages kidney tissue or causes constant bleeding
- has grown larger (as seen on follow up x-ray studies).

Until 20 years ago, surgery was necessary to remove a stone. It was very painful and required a recovery time of 4 to 6 weeks. Today, treatment for these stones is greatly improved, and many options do not require major surgery.

Extracorporeal Shockwave Lithotripsy

Extracorporeal shockwave lithotripsy (ESWL) is the most frequently used procedure for the treatment of kidney stones. In ESWL, shock waves that are created outside the body travel through the skin and body tissues until they hit the denser stones. The stones break down into sand-like particles and are easily passed through the urinary tract in the urine.



Extracorporealshockwave lithotripsy

There are several types of ESWL devices. In one device, the patient reclines in a water bath while the shock waves are transmitted. Other devices have a soft cushion on which the patient lies. Most devices use either x rays or ultrasound to help the surgeon pinpoint the stone during treatment. For most types of ESWL procedures, anesthesia is needed.

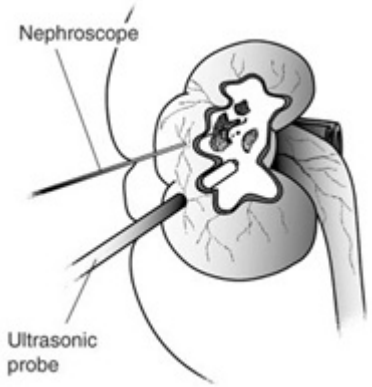
In most cases, ESWL may be done on an outpatient basis. Recovery time is short, and most people can resume normal activities in a few days.

Complications may occur with ESWL. Most patients have blood in their urine for a few days after treatment. Bruising and minor discomfort in the back or abdomen from the shock waves are also common. To reduce the risk of complications, doctors usually tell patients to avoid taking aspirin and other drugs that affect blood clotting for several weeks before treatment.

Another complication may occur if the shattered stone particles cause discomfort as they pass through the urinary tract. In some cases, the doctor will insert a small tube called a stent through the bladder into the ureter to help the fragments pass. Sometimes the stone is not completely shattered with one treatment, and additional treatments may be needed. ESWL is not ideal for very large stones.

Percutaneous Nephrolithotomy

Sometimes a procedure called percutaneous nephrolithotomy is recommended to remove a stone. This treatment is often used when the stone is quite large or in a location that does not allow effective use of ESWL.



Percutaneous nephrolithotomy

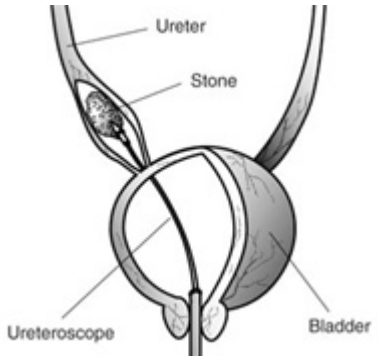
In this procedure, the surgeon makes a tiny incision in the back and creates a tunnel directly into the kidney. Using an instrument called a

nephroscope, the surgeon locates and removes the stone. For large stones, some type of energy probe (ultrasonic or electrohydraulic) may be needed to break the stone into small pieces. Generally, patients stay in the hospital for several days and may have a small tube called a nephrostomy tube left in the kidney during the healing process.

One advantage of percutaneous nephrolithotomy over ESWL is that the surgeon removes the stone fragments instead of relying on their natural passage from the kidney.

Ureteroscopic Stone Removal

Although some kidney stones in the ureters can be treated with ESWL, ureteroscopy may be needed for mid- and lower-ureter stones. No incision is made in this procedure. Instead, the surgeon passes a small fiberoptic instrument called a ureteroscope through the urethra and bladder into the ureter.



Ureteroscopic stone removal

The surgeon then locates the stone and either removes it with a cage-like device or shatters it with a special instrument that produces a form of shock wave. A small tube or stent may be left in the ureter for a few days to help the lining of the ureter heal. Before fiber optics made ureteroscopy

possible, physicians used a similar "blind basket" extraction method. But this outdated technique should not be used because it may damage the ureters.

Parathyroid surgery

Some calcium stones are caused by overactive parathyroid glands, which are located on the four corners of your thyroid gland, just below your Adam's apple. When these glands produce too much parathyroid hormone, your body's level of calcium can become too high, resulting in excessive excretion of calcium in your urine. Most often, this is the result of a small benign tumor in one of your four parathyroid glands. A doctor can surgically remove the tumor.

MEDICAL/LEGAL PITFALLS

- Medical/legal issues related to urinary lithiasis are similar to other areas of radiology. A missed diagnosis may progress to renal damage, or the renal infection may worsen. Untreated urinary obstruction with infection may progress rapidly to renal damage and possibly sepsis and subsequent multi-organ failure. Other unrelated findings on radiologic examinations may also be overlooked. Renal colic is extremely painful and if the diagnosis is missed, the patient does not receive adequate pain control.

- If contrast material is used for IVU or for problem solving with CT, nephrotoxicity and allergy-like reactions are possible. Patients may potentially sue for contrast material–related injuries if nonenhanced CT was available but not used.

- Radiation exposure should be minimized in pregnant women, and female patients should be questioned carefully. If needed, a pregnancy

test should be performed prior to CT scanning or radiography. US may be used initially in pregnant or pediatric patients, but CT may be indicated to confirm or diagnose urinary stone disease and exclude other pelvic pathology in pregnant women.

SPECIAL CONCERNS

In the diagnosis and treatment of kidney stones, special concerns exist in patients who are pregnant, in those who have contraindications to the use of contrast media, and in those with renal insufficiency.

- Pregnancy does not predispose patients to stone formation; however, stone formation is a complication in as many as 0.05% of pregnancies, and the diagnosis may be difficult to establish with imaging because of the displacement and obscuration of organs by the enlarged uterus and fetus. Consider using US first in a pregnant patient, especially in the first trimester. IVU can be used, but the views should be limited to scout and 10- to 30-minute images if possible. CT can also be useful, and the radiation dose may be justified (especially if the clinical picture is confusing), because any fetal damage is unlikely at the typical radiation doses. Minimize the dose by increasing the pitch and decreasing the milliamperage. MRI may be a useful tool for problem solving.

- Nonenhanced CT results are usually diagnostic, but if contrast material is needed, actions can be taken to decrease the risk of an adverse reaction in patients. The patient can be premedicated with steroids and histamine blockers. Use of low-osmolar contrast agent also helps. Use of iodinated contrast agents should be avoided in patients who have had previous life-threatening reactions. Nonenhanced CT is usually sufficient with the aid of US and MRI as problem-solving tools. Nuclear scintigraphy may also be helpful in confirming obstruction.

- Usually, in patients with renal insufficiency, nonenhanced CT is sufficient. Very poor renal function results in a failure to opacify the collecting system. As in pregnant patients, US, MRI, and scintigraphy can be useful as problem-solving tools.

II. HOMOEOPATHIC CONCEPT

Dr. Hahnemann defines diseases in §19 (Organon Of Medicine 5th Edition), as "diseases are nothing more than alterations in the state of health of the healthy individual which express themselves by morbid signs".

Disease is a purely dynamical disturbance of the vital power and functions, which may or may not ultimate in gross tissue changes[36].

Homoeopathy perceives that there is something prior to these ultimate pathological changes. Tissue changes are of the body and are the results of the disease, they are not the disease.

In the healthy condition of man, the spiritual vital force (autocracy), the dynamis that animates the material body (organism), rules with unbounded sway, and retains all the parts of the organism in admirable, harmonious, vital operation, as regards both sensations and functions, so that our indwelling, reason-gifted mind can freely employ this living, healthy instrument for the higher purpose of our existence (§9, Organon Of Medicine 5th Edition).

When a person falls ill, it is only this spiritual, self acting (automatic) vital force, everywhere present in his organism, that is primarily deranged by the dynamic influence upon it of a morbific agent inimical to life; it is only the vital force, deranged to such an abnormal state, that can furnish the

organism with its disagreeable sensations, and incline it to the irregular processes which we call disease (§11, Organon Of Medicine 5th Edition).

AETIOLOGICAL CONCEPT OF DISEASE IN HOMOEOPATHY

Useful to the physician in assisting him to cure are the particulars of the most probable exciting cause of the acute disease, as also the most significant points in the whole history of the chronic disease, to enable him to discover its fundamental cause, which is generally due to a chronic miasm (§5, Organon Of Medicine 5th Edition).

As far the greatest number of diseases are of dynamic (spiritual) origin and dynamic nature, there cause is not perceptible to the senses.

Now, as in a disease, from which no manifest exciting or maintaining cause (causa occasionalis) has to be removed, we can perceive nothing but the morbid symptoms, it must (regard being had to the possibility of a miasm, and attention paid to the accessory circumstances, §5 Organon Of Medicine 5th Edition) be the symptoms alone by which the disease demands and points to the remedy suited to relieve it. The totality of these its symptoms, of this outwardly reflected picture of the internal essence of the disease, in each individual case of disease must be the sole indication, the sole guide to direct us in the choice of a remedy [§7, §18 (Organon Of Medicine 5th Edition)].

If the physician succeeds in removing the whole group of symptoms and the entire collection of the perceptible phenomena, he has like wise most assuredly destroyed the internal, hidden cause of the disease.

Homoeopathy might well be defined as the science of vital dynamics. Its field is the field of disordered vital phenomena and functional changes in

the individual patient, irrespective of the name of the disease or of its cause. Its object is the restoration of order and harmony in vital functioning in the individual patient[37].

PATHOLOGY AND HOMOEOPATHY

Human pathology is the science which treats of diseased or abnormal conditions of living human beings. It is customary to divide the subject into general and special pathology. Special Pathology is divided into medical pathology, dealing with internal morbid conditions, and surgical pathology, which deals with external conditions. General Pathology bears the same relation to special pathology that philosophy bears to the special sciences. It is the synthesis of the analyses made by special pathology. It deals with principles, theories, explanations and classifications of facts. Homœopathic General Pathology is concerned with Chronic Diseases[38].

Dr. Hahnemann classifies the dynamic diseases broadly into two in §72. "The disease to which man is liable are either rapid morbid processes of the abnormally deranged vital force, which have a tendency to finish their course more or less quickly, but always in a moderate time - these are termed acute diseases; - or they are diseases of such a character that, with small, often imperceptible beginnings, dynamically derange the living organism, each in its own peculiar manner, and cause it gradually to deviate from the healthy condition, in such a way that the automatic life energy, called vital force, whose office is to preserve the health, only opposes to them at the commencement and during their progress imperfect, unsuitable, useless resistance, but is unable of itself to extinguish them, but must helplessly suffer (them to spread and) itself to be ever more and more abnormally deranged, until at length the organism is destroyed; these are termed chronic diseases. They are caused by infection with a chronic miasm." (§72, Organon Of Medicine 5th Edition).

As per Hahnemannian classification, Urolithiasis comes under dynamic chronic diseases. So, knowing a patient with Urolithiasis from Homeopathic point of view is concerned with the knowledge of chronic diseases and chronic miasms.

RELEVANCE OF CLINICAL FEATURES IN HOMOEOPATHY

The totality of the symptoms is the true and only basis for every homœopathic prescription[39].

Symptoms are the deviations from the former healthy state of the now diseased individual, which are felt by the patient himself, remarked by those around him and observed by the physician (§6, Organon Of Medicine 5th Edition).

In the search for a homœopathic specific remedy, the more striking, singular, uncommon and peculiar (characteristic) signs and symptoms of the case of disease are chiefly and most solely to be kept in view; for it is more particularly these that very similar ones in the list of symptoms of the selected medicine must correspond to, in order to constitute it the most suitable for effecting the cure. The more general and undefined symptoms: loss of appetite, headache, debility, restless sleep, discomfort, and so forth, demand but little attention when of that vague and indefinite character, if they cannot be more accurately described, as symptoms of such a general nature are observed in almost every disease and from almost every drug (§153, Organon Of Medicine 5th Edition).

Dr. J T Kent classifies symptoms as General symptoms, Common symptoms and Particular symptoms. Also, he grades each of them into three level as Highest/First, Second and Third[40].

The Totality of the Symptoms means all the symptoms of the case which are capable of being logically combined into a harmonious and consistent whole, having form, coherency and individuality. Technically, the totality is more (and may be less) than the mere numerical totality of the symptoms. The totality must express an idea. When studying a case from the diagnostic standpoint, for example, certain symptoms are selected as having a known pathological relation to each other, and upon these is based the diagnosis. The classification of symptoms thus made represents the diagnostic idea. Just so the "totality of the symptoms," considered as the basis of a homœopathic prescription, represents the therapeutic idea. These two groups may be and often are different. The elements which go to make up the therapeutic totality must be as definitely and logically related and consistent as are the elements which go to make up the diagnostic totality[41].

The Totality is more than the mere aggregate of its constituent symptoms. It is the numerical aggregate plus the idea or plan which unites them in a special manner to give them its characteristic form[42].

SIGNIFICANCE OF INVESTIGATIONS AND DIAGNOSIS OF THE DISEASE

One of the popular misconceptions about Homoeopathy is that it has little to do with diagnosis of disease and that a homoeopathic physician does not require the various auxiliary facilities like pathological, biochemical, radiological or other laboratory investigations for the practice of this specialty. But this is not wholly true. What we actually oppose is prescription based on common pathological conditions. Although the selection of homoeopathic remedy does not depend absolutely on the diagnosis, but it is important to a homoeopath in relation to the following aspects.

I. To forecast the prognosis

II. For general management.

1. Diet: Restriction of sugar, and other starchy food In DM
2. Mode of life: For suggestions regarding the hygienic conditions, exercise, occupation etc that has a great influence in the management of Diabetes Mellitus.
3. Auxiliary Management: Apart from medicinal management, in conditions like diabetic ketoacidosis, the help of auxiliary management like fluid replacement is essential in order to save the life of the patient. Such necessity can only be assessed by the diagnosis of the disease.

III. For therapeutic purpose.

1. To know the curability of the case: Dr. Kent says, "By means of physical diagnosis the physician may find out the changes in organs, and determine if the patient is incurable. Without diagnosis we may go on applying the medicine in the false hope of curing him."
2. To select the line of treatment: It enables the physician to discriminate cases that require medicinal or surgical aid. It also distinguishes between that which is curable and incurable, so that we can choose curative or palliative treatment respectively.
3. To identify the nature of disease: Artificial and natural diseases produce similar symptoms. For e.g.: Comatose condition may be attributed to various causes such as diabetes, opium poisoning, heat stroke etc. Management varies in each case, which can be determined by diagnosis.

4. To select the homoeopathic remedy: By differentiating between common and uncommon symptoms. By assessing the stage of disease.
5. To select the most suitable potency of the medicine For eg..Advanced pathological changes call for a low potency, as higher potencies provoke serious aggravation and endanger patient's life.

IV. To follow up the case

1. For ascertaining the effects of treatment, whether the patient is improving not only clinically, but also pathologically by comparing the investigation reports at different periods.
2. For evaluating new symptoms. Diagnosis enables us to decide whether the newly developed symptoms are due to the natural progress of the disease or due to the action of the remedy and thus helps to differentiate between homoeopathic aggravation and disease aggravation.

V. For isolation and notification of the contagious disease

VI. To convince the patient and the relatives.

VII. To issue certificates for official purposes such as medical certificates, death certificates etc.

VIII. For medico legal purposes

IX. For record keeping, statistical analysis, research works, seminars etc, which go in the way of advancement of the system

SIGNIFICANCE OF DIAGNOSIS OF THE PATIENT

The selection of Homoeopathic remedies depends absolutely on the diagnosis of the patient than of the disease.

HOMOEPATHIC MANAGEMENT

General Management Diet and regimens need to be followed in chronic diseases are well explained by Dr. Hahnemann in his works. Besides the calculi diet, homoeopathist has to consider some additional precautions regarding diet and regimen as per Hahnemann's directions. "Considering the minuteness of the doses necessary and proper in homœopathic treatment, we can easily understand that during the treatment everything must be removed from the diet and regimen which can have any medicinal action, in order that the small dose may not be overwhelmed and extinguished or disturbed by any foreign medicinal irritant" (§259, Organon Of Medicine 5th Edition). "The softest tones of a distant flute that in the still midnight hours would inspire a tender heart with exalted feelings and dissolve it in religious ecstasy, are inaudible and powerless amid discordant cries and the noise of day" (Foot note 1 of §259, Organon Of Medicine 5th Edition).

"Hence the careful investigation into such obstacles to cure is so much the more necessary in the case of patients affected by chronic diseases, as their diseases are usually aggravated by such noxious influences and other disease-causing errors in the diet and regimen, which often pass unnoticed" (§260, Organon Of Medicine 5th Edition).

"The most appropriate regimen during the employment of medicine in chronic diseases consists in the removal of such obstacles to recovery, and in supplying where necessary the reverse: innocent moral and intellectual recreation, active exercise in the open air in almost all kinds of weather (daily walks, slight manual labor), suitable, nutritious, unmedicinal food and drink, etc." (§261, Organon Of Medicine 5th Edition).

Medicinal Management Rapid cure might be obtained under three conditions. "Firstly, if the medicine selected with the utmost care was

perfectly homœopathic; secondly, if it was given in the minutest dose, so as to produce the least possible excitation of the vital force, and yet sufficient to effect the necessary change in it; and thirdly, if this minutest yet powerful dose of the best selected medicine be repeated at suitable intervals, which experience shall have pronounced to be the best adapted for accelerating the cure to the utmost extent, yet without the vital force, which it is sought to influence to the production of a similar medicinal disease, being able to feel itself excited and roused to adverse reactions." (§246, Organon Of Medicine 5th Edition).

I. Medicines: Discussed in the section, Therapeutics.

II. Dose: Apart from selecting the most similar homoeopathic remedy possible, a homoeopathic physician has to be aware of certain other vital facts too, which include right dose and potency of the selected medicine.

Speaking of the dose, "The suitableness of a medicine for any given case of disease does not depend on its accurate homœopathic selection alone, but likewise on the proper size, or rather smallness, of the dose. If we give *too strong a dose* of a medicine which may have been even quite homœopathically chosen for the morbid state before us, it must, notwithstanding the inherent beneficial character of its nature, prove injurious by its mere magnitude, and by the unnecessary, too strong impression which, by virtue of its homœopathic similarity of action, it makes upon the vital force which it attacks and, through the vital force, upon those parts of the organism which are the most sensitive, and are already most affected by the natural disease." (§275, Organon Of Medicine 5th Edition)

"For this reason, a medicine, even though it may be homœopathically suited to the case of disease, does harm in every dose that is too large, the more harm the larger the dose, and by the magnitude of the dose it does

more harm the greater its homœopathicity and the higher the potency selected, and it does much more injury than any equally large dose of a medicine that is unhomœopathic, and in no respect adapted (allopathic) to the morbid state; for in the former case the so-called homœopathic aggravation, the very analogous medicinal disease produced by the vital force stirred up by the excessively large dose of medicine, in the parts of the organism that are most suffering and most irritated by the original disease - which medicinal disease, had it been of appropriate intensity, would have gently effected a cure - rises to an injurious height; the patient, to be sure, no longer suffers from the original disease, for that has been homœopathically eradicated, but he suffers all the more from the excessive medicinal disease and from useless exhaustion of his strength." (§276, Organon Of Medicine 5th Edition)

According to him, pure experiment, careful observation and accurate experience can alone determine the degree of minuteness necessary to effect the best cure in a given case (§278, Organon Of Medicine 5th Edition).

Repetition of doses - Homoeopathy also forbids frequent repetition of doses unnecessarily. To quote Hahnemann "It is a fundamental rule in the treatment of chronic diseases: To let the action of the remedy, selected in a mode homoeopathically appropriate to the case of disease, come to an undisturbed conclusion, so long as it visibly advances the cure, and while improvement still perceptibly progresses. This method forbids any new prescription as well as the immediate repetition of the same remedy."[43]

The only axiom for repetition is to repeat when the original symptoms reappear or when improvement ceases.

III Potency: "Assuming that there is a difference in the action of the various doses of medicines, and that a series of potencies or

preparations of the different medicines has been available for use; it follows that the entire series should be open to every practitioner, and that each man should be competent, willing and ready to use any potency or preparation of the remedy indicated in a given case, without prejudice. If he confines himself to one or two potencies, be they low, medium, or high, he is limiting his own usefulness and depriving his patient of valuable means of relief and cure" [44].

IV Single remedy: "In no case, it is requisite to administer more than one single, simple medicinal substance at one time." (§272, Organon Of Medicine 5th Edition). The use of single remedy is obviously a necessary corollary of the rule: as the drug is proved so it must be administered, if it is a true SIMILE [45].

Before concluding the management part, let us remember the words of our master, "The physician can, indeed, make no worse mistake than first, to consider as too small the doses which I (forced by experience) have reduced after manifold trials and which are indicated with every antipsoric remedy and secondly, the wrong choice of a remedy, and thirdly, the hastiness which does not allow each dose to act its full time." [46].

REPERTORIAL REPRESENTATION OF UROLITHIASIS

My present attempt is to suggest several rubrics from the major repertories, that are peculiarly pertinent to the condition we are studying. But when we are brought face to face with the widely varying array of functional symptoms manifested by the patients, it seems we can do no more than recommending the repertories themselves. It is impossible to limit the wide range of symptoms in a limited list of selected rubrics. The axiom that must never be forgotten in the repertory work is "Carry the results to the materia medica. The repertory is a means to an end, never an end in itself". So we can repeat what H. A. Robert warns: Learn the value of your repertory for reference work, and you will be well repaid for the time expended.

I. Complete Repertory by Roger Von Zandvoort

Bladder: calculi — Total Drugs: 83

3 Mark

Benz-ac, Berb, Calc, Canth, Lyc, Sars, Sep

2 Mark

Ambr, Bell, Chin, Coc-c, Eup-pur, Ipom, Lach, Lith-c, Meny, Mill, Nit-ac, Nux-m, Nux-v,Pareir ,Petr, Phos, Puls, Raph, Ruta, Sil, Tab, Urt-u

a. Bladder: Ulceration: Calculi, from : — Total Drug: 1

1 Mark

All-s

b. Urine: Sediment: Renal calculi — Total Drugs: 89

3 Mark

Benz-ac,Calc, Lith-c, Lyc, Pareir, Sars

2 Mark

Ant-c, Berb, Cann-s, Canth, Dios, Epig, Eup-pur, Nux-v, Phos, Pic-ac, Ruta, Sep, Sil, Solid, Still, Urt-u, Zinc

c. Urine :Sediment: Sand: Gravel, small calculi: Total Drugs: 54

3 Mark

Lyc, Sars, Sep,

2 Mark

Ant-c, Bar-m, Berb, Calc, Cann-s, Epig, Ipom, Lith-c, Nux-v, Petr, Phos, Ruta, Sil, Thlaspi

II. Repertory of Homoeopathic Materia Medica by J.T.Kent

a. Bladder : Calculi: Total Drugs: 35

3 Mark

Benz-ac, Berb, Calc, Canth, Lyc, Sars, Sep

2 Mark

Chin, Coc-c, Eup-per, Lach, Lith, Mill, Nit-ac, Nux-m, Nux-v, Pareir, Petr, Phos, Puls, Raph, Ruta, Sil.

b. Bladder : Ulceration:Calculi,caused by: Total Drug: 1

1 Mark

All-s

c. Urine : Sediment:Renal calculi: Total Drugs: 17

3 Mark

Benz-ac, Calc, Lith, Lyc, Pareir, Sars

2 Mark

Berb, Canth, Phos, Sil

d. Urine : Sediment:Sand:Gravel (small calculi): Total Drugs: 15

3 Mark

Lyc, Sars, Sep

2 Mark

Berb, Calc

III. Allens Repertory

a. Urine: Calculi:- Total Drugs: 2

1 Mark

Kali-i, Lip

IV. Boennighausen's Therapeutic Pocket book

Urinary organs : Kidneys:Calculi: Total Drugs: 23

4 Mark

Lyc, Sars

3 Mark

Ant-c, Calc, Cann-s, Nux-v, Phos, Ruta, Sep, Sil, Zinc

2 Mark

Canth, Nit-ac, Nux-m, Petr, Sulph

V. Clinical Repertory by William Boericke

a. Urinary system : Kidneys:Calculi, gravel (nephrolithiasis) - Colic:

Total Drugs: 42

3 Mark

Arg-n, Bell, Berb, Canth, Coc-c, Dios, Epig, Eup-pur, Fab, Lyc, Nit-ac, Nux-v, Oci, Pareir, Sars, Stigm, Tab.

2 Mark

Baros, Benz-ac, Calc, Calcul-r, Cham, Chin-s, Coll, Erig, Ery-a, Hedeo, Hep, Hydrang, Ipom, Med, Onis, Op, Oxyd, Pipe, Polyg, Sep, Solid, Thlaspi, Urt-u, Uva, Vesi.

VI. Boennighausen's Characteristics and Repertory by C.M.Boger

a. Generalities : Calculi, atheroma, etc: Total Drugs: 18

3 Mark

Lyc

2 Mark

Bell, Berb, Calc 2 Chin 2 Coloc 2 Nux-v 2 Sars

VII.Clinical Repertory by Clarke

a. Renal calculi: Total Drugs: 4

2 Mark

Calcul-r, Nux-v, Oci, Thlaspi.

b. Urinary:Calculi: Total Drug: 1

2 Mark

Lipp

VIII. Corcordance Repertory by Gentry

a. Urine and Urinary Organs : Bladder:Calculi in bladder and kidneys: Total Drugs: 2

1 Mark

Sars, Zinc

b. Calculi:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters: Total Drug: 1

1 Mark

Arn

c. Urine and Urinary Organs, Calculi:Urine contains gravel or small calculi:- Total Drug: 1

1 Mark

Sars

d. Urine and Urinary organs, Gravel:Urine contains gravel or small calculi:- Total Drug: 1

1 Mark

Sars

e. Urine and Urinary Organs, Inflammation:From passage of calculi, with piercing pains in kidneys and along ureters:

Total Drug: 1

1 Mark

Arn

f. Kidneys:Calculi in bladder and kidneys: Total Drugs: 2

1 Mark

Sars, Zinc

g. Kidneys:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters: Total Drug: 1

1 Mark

Arn

h. Urine and Urinary Organs : Pains:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters:- Total Drug: 1

1 Mark

Arn

i. Urine and Urinary Organs : Passage:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters:- Total Drug: 1

1 Mark

Arn

j. Urine and Urinary Organs : Piercing:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters: Total Drug: 1

1 Mark

Arn

k. Urine and Urinary Organs, Sediment:Of calculi: Total Drugs: 2

1 Mark

Sars, Zinc

l. Urine and Urinary Organs : Ureters:Inflammation from passage of calculi, with piercing pains in kidneys and along ureters:- Total Drug: 1

1 Mark

Arn

IX Knerr's Repertory

a. Urinary Organs: Bladder:Calculi (gravel, stone): Total Drugs: 47

4 Mark

Berb, Calc, Canth, Lyc, Sars, Sep

3 Mark

Benz-ac, Cann-i, Chin, Lach, Lith-c, Nit-ac, Nux-m, Nux-v, Pareir, Petr, Phos, Puls, Ruta, Sil

2 Mark

Ant-c, Apoc, Arg-n, Ars, Aspar, Bell, Carb-v, Coc-c, Colch, Coloc, Cupr, Eup-pur, Graph, Kreos, Thuj, Uva.

b. Urinary Organs : Bladder:Irritability:Calculi, from: Total Drug: 1

2 Mark

Erig

c. Urinary Organs : Bladder:Ulceration:Caused by calculi: Total Drug: 1

1 Mark

All-s

d. Urinary Organs: Kidney:Calculi:-Knerr->Urinary Organs:

Total Drugs:13

4 Mark

Lyc, Sars

3 Mark

Ipom, Sep, Sil, Tab

2 Mark

Eup-pur

e. Urinary Organs : Kidney:Colic:Calculi, during passage of:

Total Drugs :3

3 Mark

Chlf, Sars

2 Mark

Chlol

f. Urinary Organs : Kidney: Pain (undefined):Calculi, with or without (nephritis): Total Drug: 1

3 Mark

Caps

g. Urinary Organs : Ureters:Spasmodic affection:From passage of calculi:- Total Drug: 1

3 Mark

Gels

h. Urinary Organs : Urine:Bloody (haematuria):Calculi, with vesical, small, round and rough: Total Drug: 1

3 Mark

Lyc

i. Lower limbs : Hips:Sharp pain:Agonizing, as from passing calculi (renal colic): Total Drug: 1

3 Mark

Arn

X. Lippes Repertory

a. Urine and Urinary Organs : Calculi in bladder and kidneys: Total Drugs: 2

2 Mark

Sars, Zinc

b. Urine and Urinary Organs : Urine:Calculi: Total Drugs: 2

2 Mark

Sars, Zinc.

XI . Biochemic Repertory

a. Calculi:- Total Drugs: 5

2 Mark

Calc-p, Calc-s, Mag-p, Nat-s, Sil.

THERAPEUTICS OF 3 MARK REMEDIES FROM MAJOR REPERTORIES

A specific remedy for urolithiasis does not exist and a homoeopathist can only find special hints extended over a large number of remedies so the remedies that I have listed here constitute only a few of the original list, which have the power to make favorable action in this disease condition. Any remedy of the vast homoeopathic Materia medica can be used in urolithiasis provided the characteristic symptoms correspond. i.e the exact similimum will prevent the recurrence of stone formation in all individuals.

- **BENZOIC ACID**

Repulsive odor; changeable color; brown, acid. dribbling, offensive urine of old men. Excess of uric acid. Vesical catarrh. Cystitis.

- **BERIBERIS**

Pain in region of kidneys is most marked; hence its use in renal and vesical troubles, gall-stones, and vesical catarrh. It causes inflammation of kidneys with haematuria. Wandering, RADIATING pains, from left kidney downwards. All Berberis pains radiate, are not worse by pressure, but worse in various attitudes, especially standing and
active exercise.

- **CALCAREA RENALIS**

Renal calculi. Stone in bladder.

- **CALC CARB**

Dark, brown, sour, fetid, abundant, with white sediment, bloody. Irritable bladder.

❖ **CANTHARIS**

INTOLERABLE URGING and tenesmus. Nephritis with bloody urine. Violent paroxysms of cutting and burning in whole renal region, with painful urging to urinate; bloody urine, by DROPS. Intolerable tenesmus; cutting before, during, and after urine. Urine scalds him, and is passed drop by drop. constant desire to urinate. Membranous scales looking like bran in water. Urine jelly-like, shreddy.

❖ **CHIMAPHILLA**

Urging to urinate. Urine turbid, offensive, containing ropy or bloody mucus, and depositing a copious sediment. Burning and scalding during micturition, and straining afterwards. MUST STRAIN before flow comes. Scanty urine. Acute prostatitis, retention, and FEELING OF A BALL IN PERINEUM Fluttering in region of kidney. SUGAR IN URINE. Unable to urinate without standing with feet wide apart and body inclined forward.

❖ **COLOCYNTH**

Intense burning along urethra during stool. Vesical catarrh, discharge like fresh white of egg. VISCID. Fetid; small quantities, with frequent urging. Itching at orifice.

Red, hard crystals, adhering firmly to vessel. Tenesmus of bladder. Pains on urinating OVER WHOLE ABDOMEN

❖ **DIOSCOREA**

Writhing, with dry and crampy pains, with passing of renal calculus (right) Spasmodic stricture of urethra, with pain about navel better by pressure, pressure on rectum, paroxysmal colic.

❖ **EQUISETUM**

Severe, dull pain and feeling of fullness in bladder, not relieved by urinating. Frequent urging with severe pain AT THE CLOSE OF URINATION.

Urine flows only drop-by-drop. Sharp, BURNING, cutting pain in urethra while urinating.

- **ERIGERON**

Persistent haemorrhage from the bladder. Haemorrhage from the uterus, with painful micturition. PROFUSE BRIGHT-RED BLOOD. with burning micturition; continual dribbling. with soreness and burning in bladder.

- **HYDRANGIA**

A remedy for gravel, profuse deposit of white amorphous salts in urine. Calculus, renal colic, bloody urine. Acts on ureter. Pain in lumbar region. Burning in urethra and frequent desire. Urine hard to start. Heavy deposit of mucus. SHARP PAIN IN LOINS, especially left. Great thirst, with abdominal symptoms and ENLARGED PROSTATE. Gravelly deposits. Spasmodic stricture.
Profuse deposit of white amorphous salts.

- **LITHIUM CARB**

Soreness of bladder; pain in right kidney and ureter. Turbid urine with mucus, scanty and dark, acrid; sandy deposits.

- **LYCOPODIUM**

Pain in back before urinating; ceases after flow; SLOW IN COMING, must strain. Retention. polyuria during the night. heavy red sediment. Child cries before urinating.

- **NITRIC ACID**

Scanty, dark, OFFENSIVE. Smells like horse's urine. COLD ON PASSING. Burning and stinging. Urine bloody and albuminous.
Alternation of cloudy, phosphatic urine

- **NUX VOMICA**

Haematuria. Pains in renal region, as if a foreign body were there, with inability to lie on side affected, scanty emission of some drops of a saturated urine, and discharge of blood from urethra. Burning pain in neck of bladder and in anterior part of urethra when making water.

- **OCIMUM CANUM**

Renal colic, especially right side. Symptoms of renal calculus are pronounced. High acidity, formation of spike crystals of uric acid. Turbid, thick, purulent, bloody; BRICK-DUST RED or yellow SEDIMENT. ODOR of musk. pain in ureters. Cramps in kidneys.

- **PAREIRA BRAVA**

Renal colic, especially right side. Symptoms of renal calculus are pronounced. High acidity, formation of spike crystals of uric acid. Turbid, thick, purulent, bloody; BRICK-DUST RED or yellow SEDIMENT. ODOR OF MUSK. PAIN IN URETERS. Cramps in kidneys.

- **PHOSPHORIC ACID**

Frequent, profuse, water, MILKY. DIABETES. Micturition, preceded by anxiety and followed by burning. FREQUENT URINATION AT NIGHT. Phosphaturia.

- **PETROSELINUM**

Burning, tingling, from perineum throughout whole urethra; sudden urging to urinate; frequent, voluptuous tickling in fossa navicularis. Gonorrhoea; sudden, irresistible desire to urinate; intense biting, itching, deep in urethra; milky discharge.

- **SARSAPARILLA**

Urine scanty, slimy, flaky, sandy, BLOODY. Gravel. Renal colic. severe pain at conclusion of urination. urine dribbles while sitting. Bladder distended and tender. CHILD SCREAMS BEFORE AND WHILE PASSING URINE. Sand on diaper. Renal colic and dysuria in infants. PAIN FROM RIGHT KIDNEY DOWNWARD. Tenesmus of bladder; urine passes in thin, feeble stream.

- **SEPIA**

Red, ADHESIVE, sand in urine. Involuntary urination, DURING FIRST SLEEP. Chronic cystitis, slow micturition, with bearing-down sensation above pubis.

- **SILICEA**

Bloody, involuntary, with red or yellow sediment.

- **TABACUM**

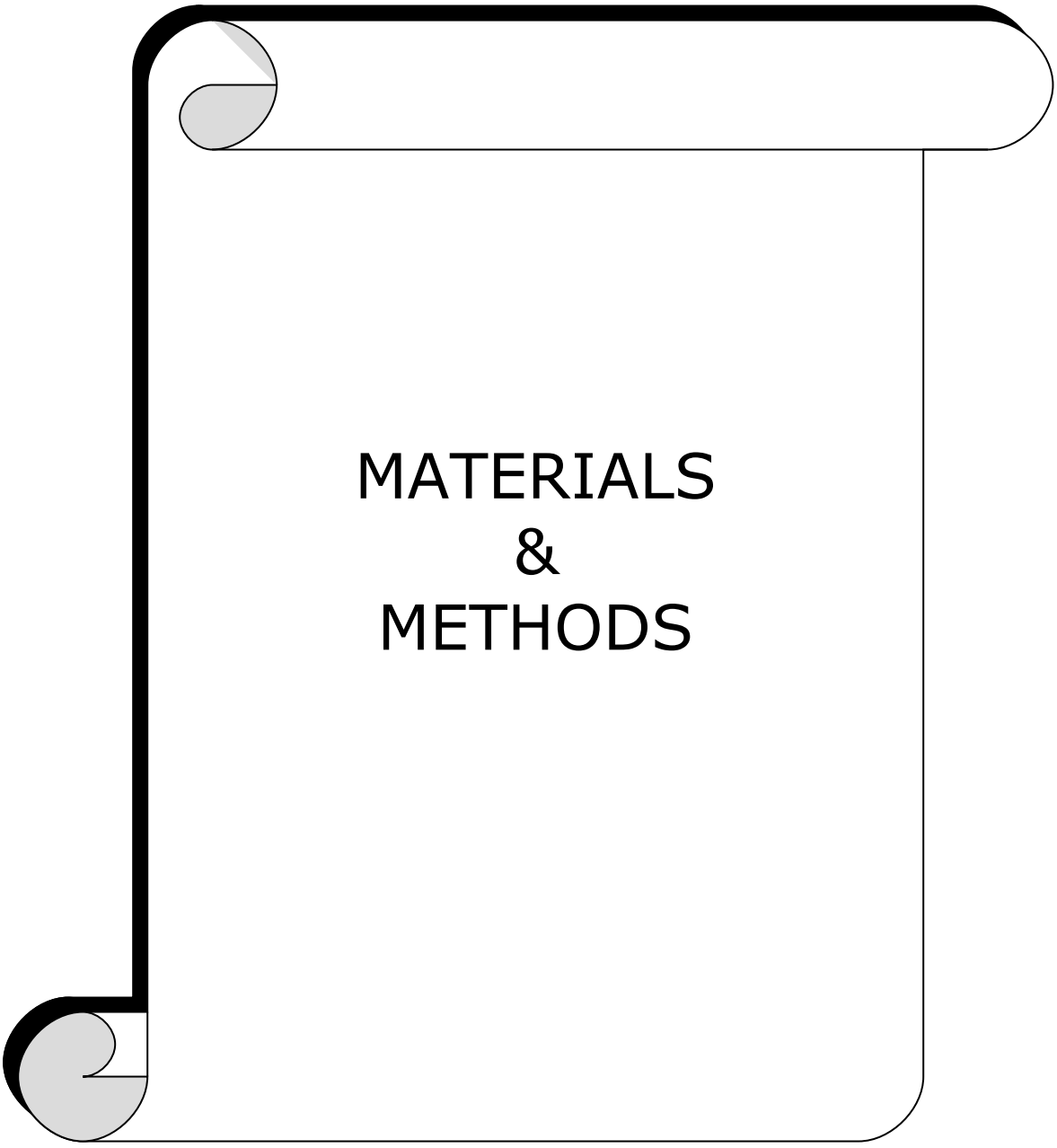
Renal colic; violent pain along ureter, left side.

- **TEREBINTH**

STRANGURY, WITH BLOODY URINE. Scanty, suppressed, ODOR OF VIOLETS. Urethritis, with painful excretions.
Inflamed kidneys following any acute disease. Constant tenesmus.

- **ZINCUM MET**

Can only void urine when sitting bent backwards. Hysterical retention. Involuntary urination when walking, coughing or sneezing.


MATERIALS
&
METHODS

This study was conducted in patients attending the outpatient unit of the department of Organon of Medicine, GHMCT between the age group 20 – 70 years, irrespective of sex, during the period of my study from 2005 to 2007.

Sample selection

A sample of 30 cases recognized as Urolithiasis based on definite criteria were selected. All the patients selected were already diagnosed as Urolithiasis before conducting the study.

Inclusion criteria

- 30 well diagnosed Urolithiasis cases, confirmed on the basis of clinical signs and symptoms along with the positive ultra sound sonography were selected.
- Age group:- 20-70 years.
- Both sexes.

Exclusion criteria

- Cases below 20 and above 70years
- Patients that do not fulfill the diagnostic criteria
- Cases with other systemic complications.

Methods

History of illness was elicited in an elaborate manner, as per the directions given by Hahnemann in aphorisms 83-104 of 5th edition of Organon of Medicine. Case history was recorded in detail. All the symptoms including subjective and objective were considered. Remedies were selected based on totality of symptoms of each patient.

Diet and regimen - The patients were directed to follow dietary restrictions according to the type of stones they have, if stone analysis was done previously. Apart from this, all the patients were restrained from taking other medications, internally or externally, strong and spicy foods, coffee, tea, condiments and other food items supposed to be of possessing medicinal

value during the study period. Also the use of strong smelling perfumes and deodorants were advised to avoid. However, 100 percent restriction of diet and regimen cannot be guaranteed.

Review and follow up

All the cases were reviewed every fortnightly.

Disease criteria used for assessment

- Abdominal pain
- Loin pain
- Dysuria
- Haematuria
- Nausea and vomiting
- Positive ultrasonogram

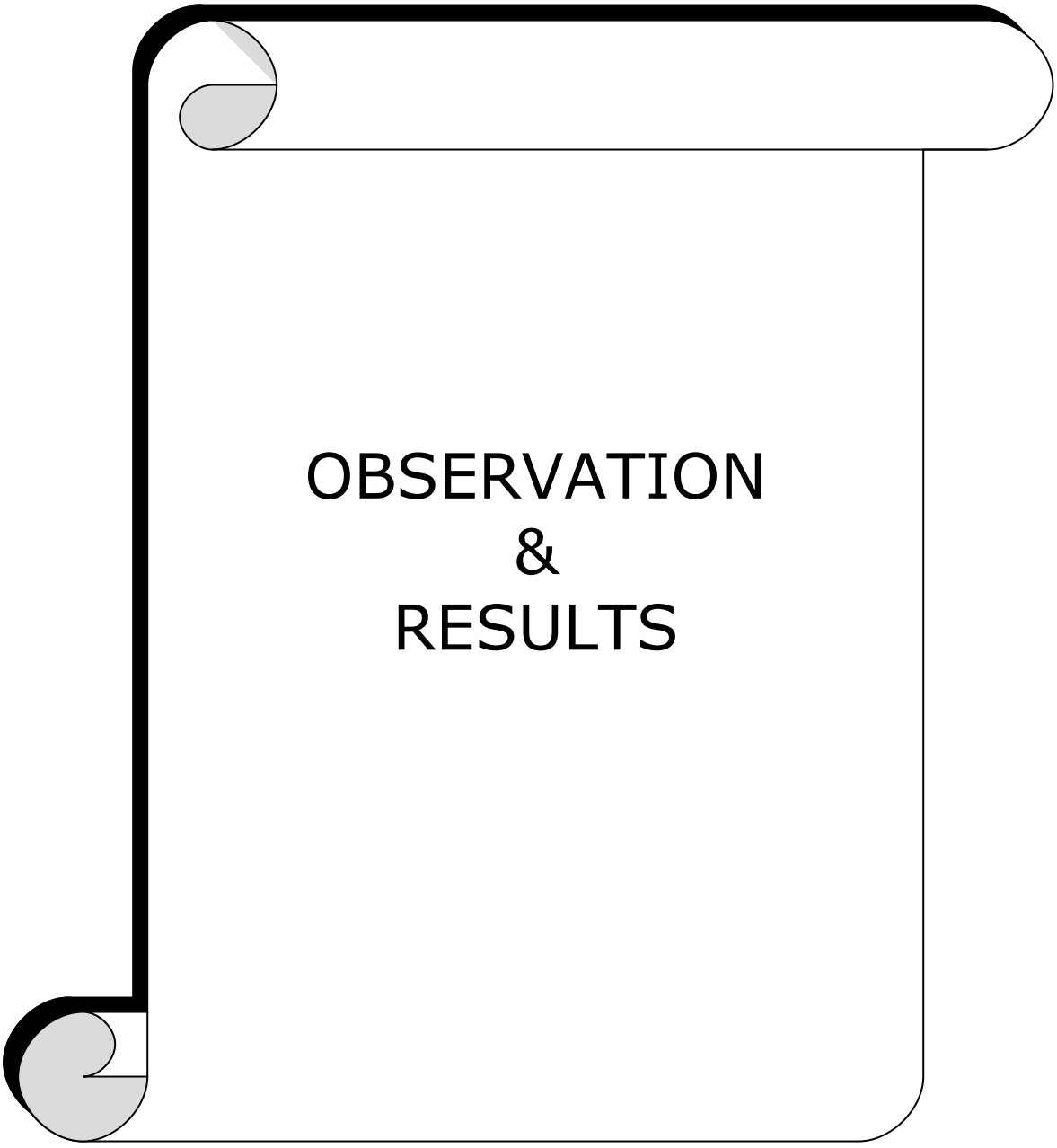
Four grades were given according to the intensity and frequency of pain and number and size of the stones as given below:

Grade	Score	Intensity of Pain	Frequency of pain	Number of stones	Size of stones
I	0	No pain	No pain	No stones	No stones
II	1	Mild	Occasional	Single	1-4mm
III	2	Moderate	Frequent	2-5	4-8mm
IV	3	Severe	Constant	>5	8-12mm

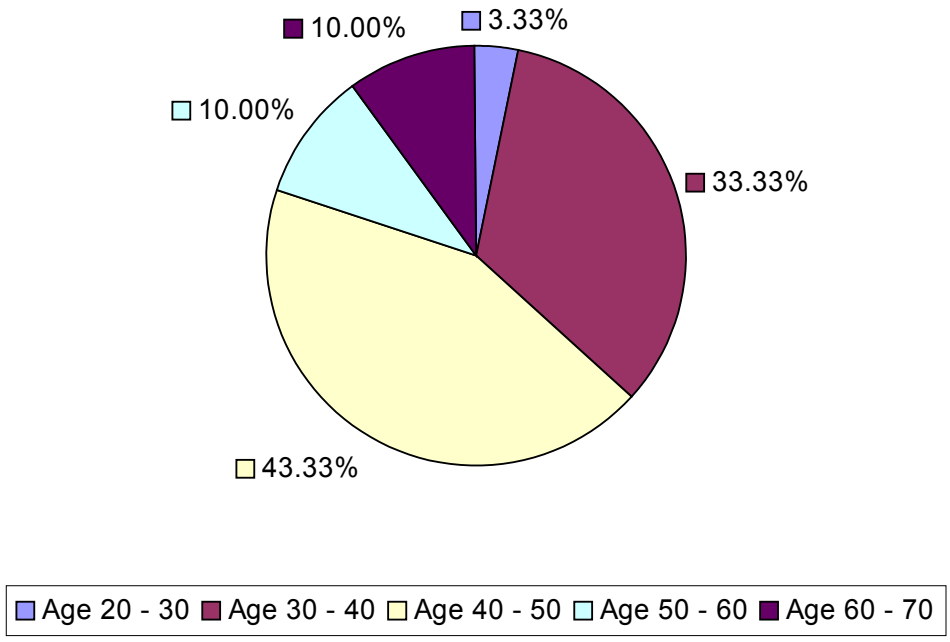
Kent's method of evaluation of symptoms was followed. Each case was repertorised using RADAR 7.0. Utmost care was taken in selecting the homoeopathic antimiasmatic remedy so that the totality of symptoms of both the patient and the medicine coincided in every case, thereby fulfilling the law of cure.

The homoeopathic principles of single remedy and minimum dose were strictly adhered to. Medicines were supplied from the pharmacy of Government Homoeopathic Medical College, Thiruvananthapuram. The dose

was, a medicated pellet of size varying from 10-30 crushed in sugar of milk to be taken at a time. Repetition of doses was also made as per strict Hahnemannian directions given in the fifth edition of 'Organon of Medicine' and 'The chronic diseases'. A dose of same medicine was repeated only when the improvement ceased and the original symptoms reappeared. Repetition was done with same potency or ascending potencies. Range of potencies used was centesimal (200 - 50M). Selection of potency depended on individual factors. For assessing the miasmatic nature of symptoms, J.H.Allen's work on 'Chronic miasms- psora and pseudopsora' and 'Miasmatic Diagnosis- practical tips with clinical comparisons by Dr. Subrata Kumar Banerjea' were used. When the totality of symptoms underwent considerable changes, case was retaken and the second medicine complementary to the previous one was administered, based on the symptom similarity. Miasmatic points were given due consideration for remedy selection. In between two doses of medication, placebo was administered liberally. Blank tablets were given from the beginning to the end along with other medicines and placebo powder.


OBSERVATION
&
RESULTS

DISTRIBUTION ACCORDING TO AGE

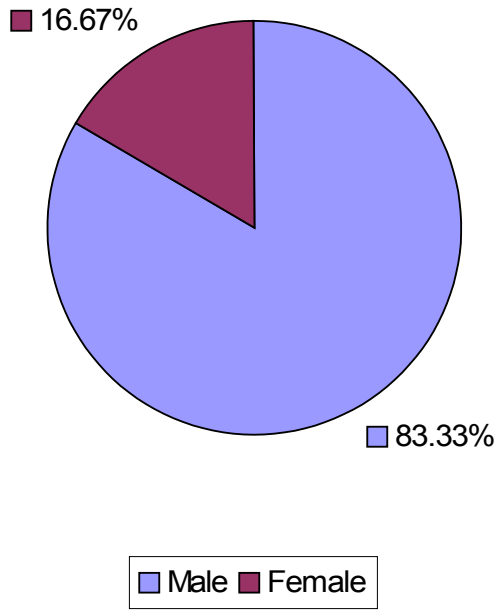


Age	No. of cases	%
20 - 30	1	3.33
30 - 40	10	33.33
40 - 50	13	43.33
50 - 60	3	10
60 - 70	3	10

RESULT:

On analysis, urinary calculi is found to occur more among the age group 40-50 i.e, 43.33%.

DISTRIBUTION ACCORDING TO SEX

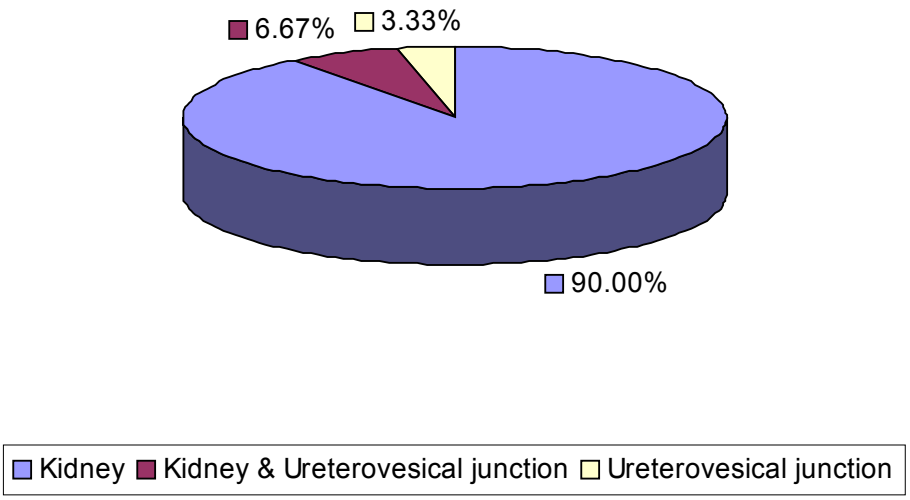


Sex	No. of cases	%
Male	**25**	**83.33**
Female	**5**	**16.67**

RESULT:

In this study conducted, male patients constitute 83.33% and female patients 16.67%.

DISTRIBUTION OF PATIENTS ACCORDING TO THE LOCATION OF CALCULI

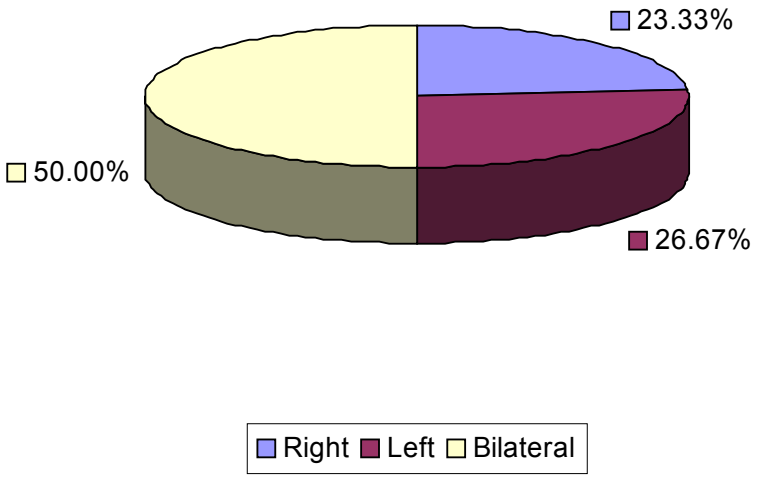


Location	No. of cases	%
Kidney	**27**	**90**
Kidney & Ureterovesical jn	**2**	**6.67**
Ureterovesical junction	**1**	**3.33**

RESULT:

Out of 30 cases, 27 cases (90%) reported with kidney stone and 2 cases with stones in kidney and Ureterovesical junction (6.67%) and the rest of the 1 case (3.33%) with Ureterovesical junction calculi.

DISTRIBUTION ACCORDING TO SIDE AFFECTED

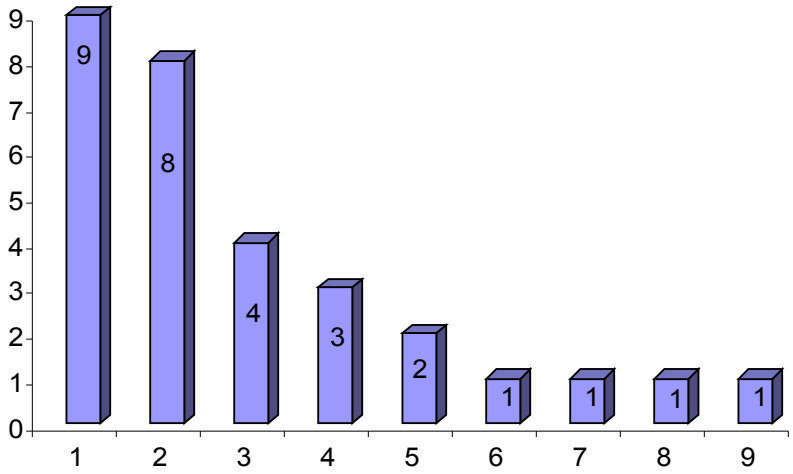


Side	No.of cases	%
Right	**7**	**23.33**
Left	**8**	**26.67**
Bilateral	**15**	**50**

RESULT:

Out of 30 cases bilateral affinity seen in 15 cases (50%), right sided affinity seen in 7 cases (23.33%) and left sided affinity in 8 cases (26.67%).

DISTRIBUTION OF PATIENTS ACCORDING TO CLINICAL FEATURES

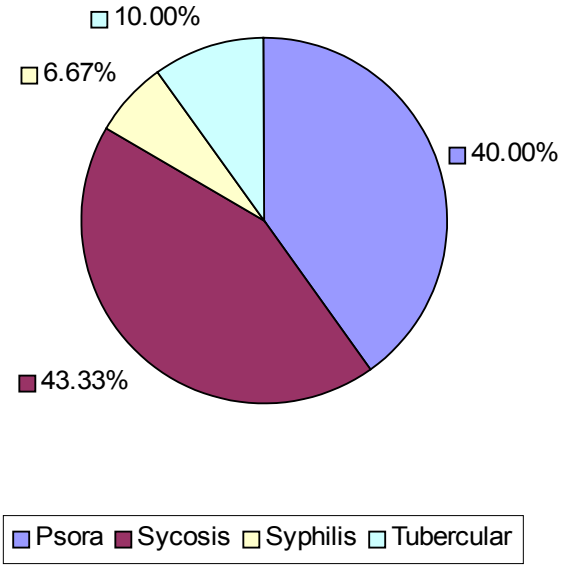


Clinical features	No of patients	%
1. Loin pain, abdominal pain & dysuria	**9**	**30**
2. Loin pain only	**8**	**26.67**
3. Loin pain & abdominal pain	**4**	**13.33**
4. Abdominal pain and dysuria	**3**	**10**
5. Loin pain & dysuria	**2**	**6.67**
6. Dysuria & Haematuria	**1**	**3.33**
7. Haematuria only	**1**	**3.33**
8. Abdominal pain only	**1**	**3.33**
9. Loin pain, abdominal pain, nausea and vomiting	**1**	**3.33**

RESULT:

Out of 30 cases, 30% patients presented with Loin pain, abdominal pain & dysuria, 26.67% patients came with Loin pain only, 13.33% cases presented with Loin pain & abdominal pain, 10% cases with Abdominal pain and dysuria, 6.67% with Loin pain & dysuria, 3.33% with Dysuria & Haematuria, 3.33% with Haematuria only, 3.33% presented with Abdominal pain only and the rest of 3.33% with Loin pain, abdominal pain, nausea and vomiting.

DISTRIBUTION OF PATIENTS ACCORDING TO PREDOMINANT MIASM

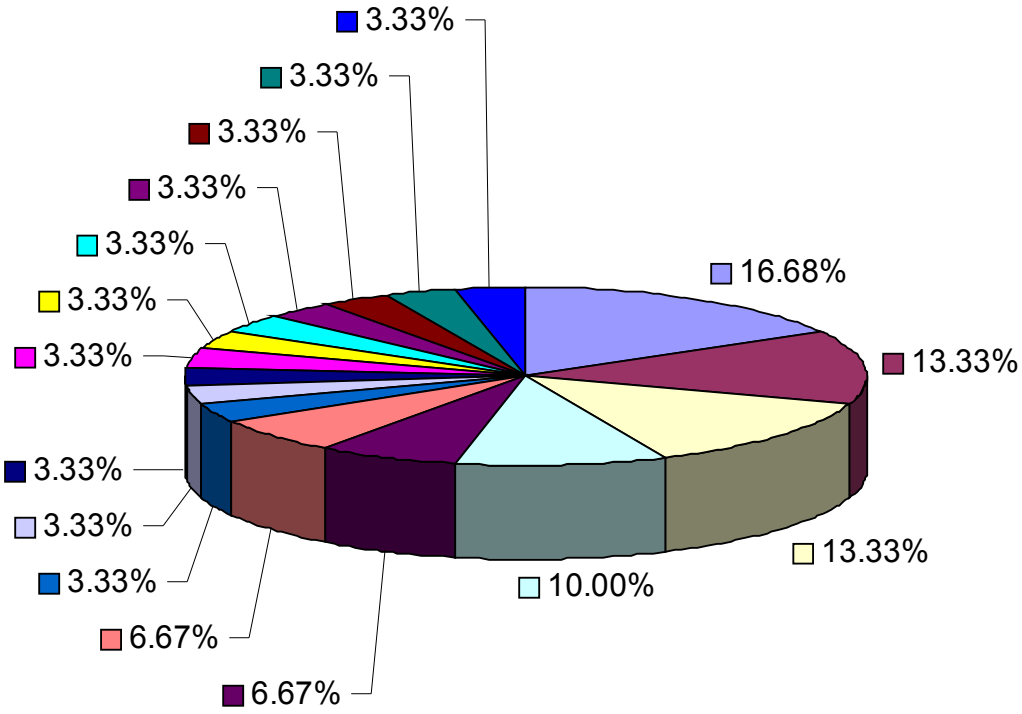


Predominant miasm	No of patients	%
Psora	12	40
Sycosis	13	43.33
Syphilis	2	6.67
Tubercular	3	10

RESULT:

Out of 30 cases, 13 patients (43.33%) shows Sycotic predominance , 12 patients (40%) shows Psoric predominance, 3 shows (10%) Tubercular predominance and 2 patients (6.67%) shows Syphilitic predominance.

ORDER OF EFFECTIVE MEDICINES



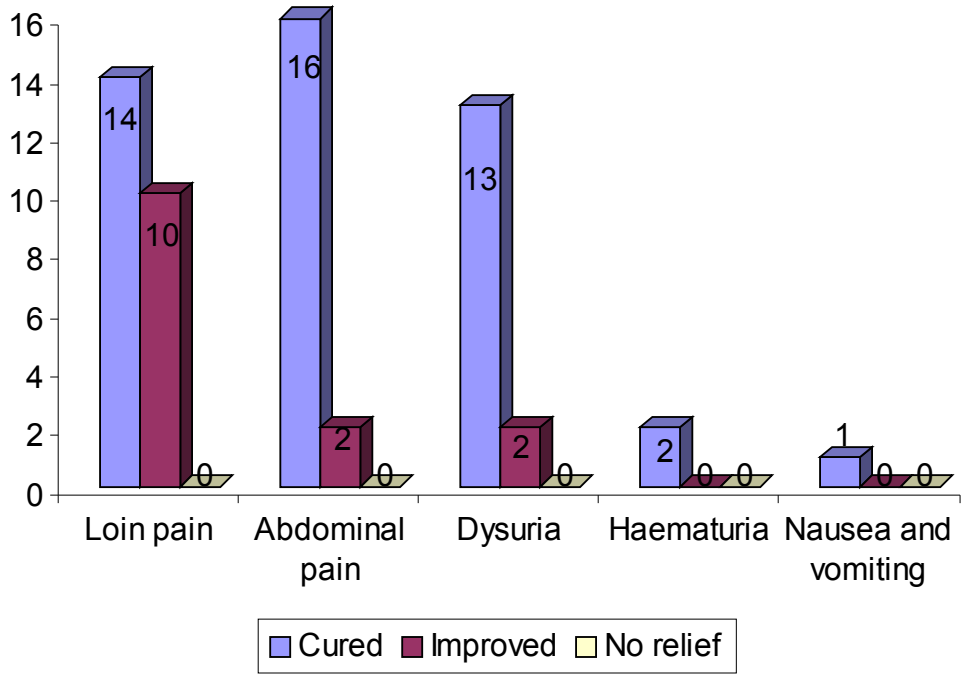
Medicines	No.of patients	%

Nuxvomica	**5**	**16.67**
Sulphur	**4**	**13.33**
Lycopodium	**4**	**13.33**
Pulsatilla	**3**	**10**
Silicea	**2**	**6.67**
Staphysagria	**2**	**6.67**
Natrum sulph	**1**	**3.33**
Sepia	**1**	**3.33**
Ignatia	**1**	**3.33**
Thuja	**1**	**3.33**
Medorrhinum	**1**	**3.33**
Calcarea carb	**1**	**3.33**
Tuberculinum	**1**	**3.33**
Mercsol	**1**	**3.33**
Apis	**1**	**3.33**
Sabina	**1**	**3.33**

RESULT:

Out of 30 cases, a single medicine cannot be said as much effective for Urolithiasis when compared to others, which emphasizes the significance of individualization in homoeopathy.

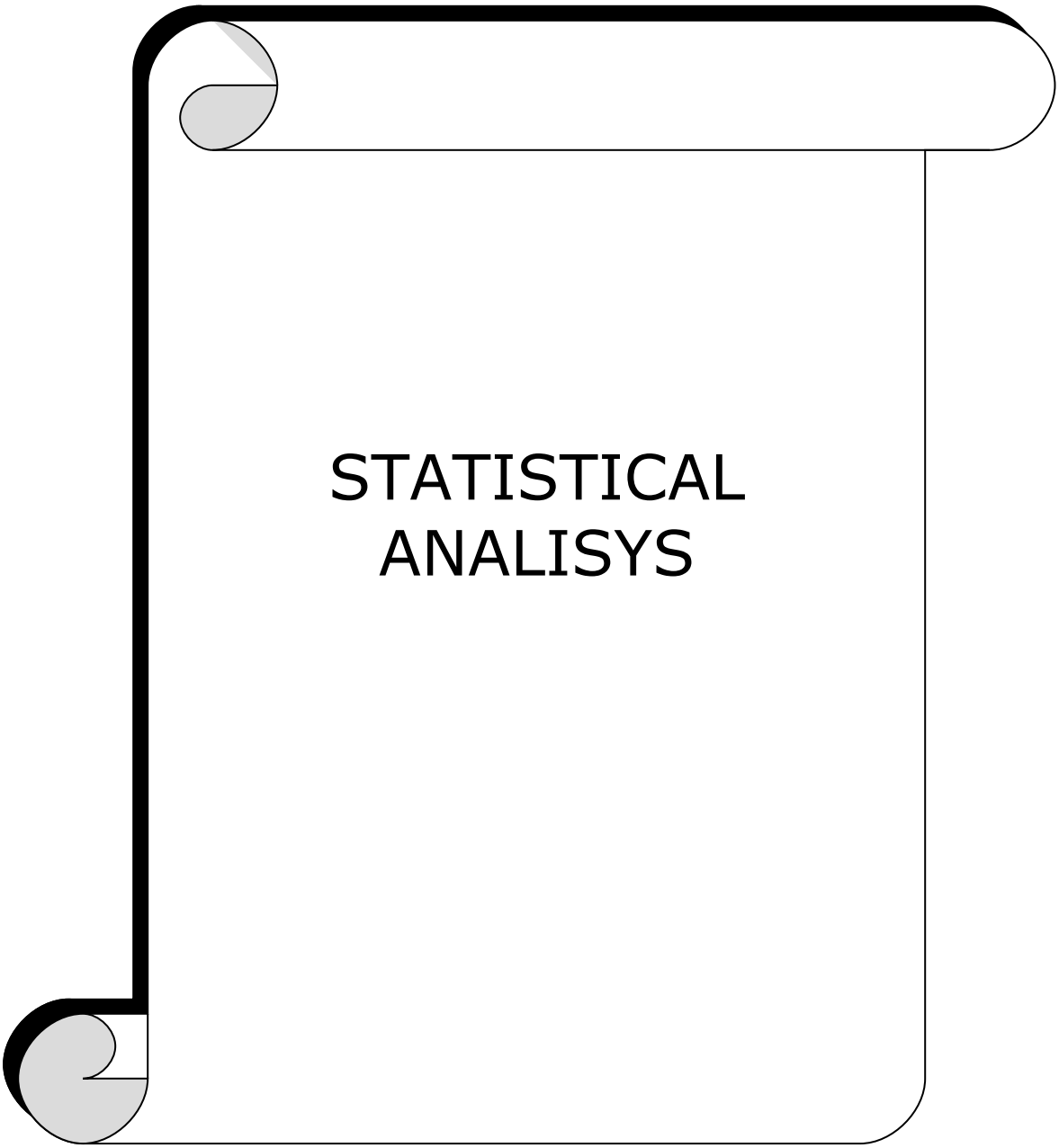
DISTRIBUTION OF PATIENTS ACCORDING TO CHANGE OF SYMPTOMS



Symptoms	No. of cases	Cured		Improved		No change	
		No	%	No	%	No	%
Loin pain	24	14	58.33	10	41.67	0	0
Abdominal pain	18	16	88.89	2	11.11	0	0
Dysuria	15	13	86.67	2	13.33	0	0
Haematuria	2	2	100	0	0	0	0
Nausea and vomiting	1	1	100	0	0	0	0

RESULT:

Out of 24 cases presented with loin pain, 14 cases (58.33%) cured and 10 cases (41.67%) improved. Out of 18 cases presented with abdominal pain, 16 cases (88.89%) cured and 2 cases (11.11%) improved. Out of 15 cases presented with dysuria, 13 cases (86.67%) cured and 2 cases (13.33%) improved. Out of 2 patients presented with haematuria and 1 patient presented with nausea and vomiting, all cases (100%) cured.


STATISTICAL
ANALISYS

STATISTICAL ANALYSIS

To analyse the difference between pre treatment observations and post treatment observations, 'paired t' test is used. Let X_1 be the value before treatment and X_2 after the treatment. Let the hypothesis be

H_0: no difference between before and after the treatment; H_1: $X_2<X_1$

Sl.No	X_1	X_2	$d= X_1- X_2$	d^2
1	7	0	7	49
2	8	7	1	1
3	9	8	1	1
4	8	0	8	64
5	8	0	8	64
6	8	0	8	64
7	7	0	7	49
8	10	5	5	25
9	3	0	3	9
10	10	8	2	4
11	8	5	3	9
12	7	0	7	49
13	8	0	8	64
14	9	0	9	81
15	7	0	7	49
16	9	6	3	9
17	3	0	3	9
18	9	4	5	25
19	7	6	1	1
20	9	0	9	81
21	5	0	5	25
22	11	8	3	9
23	11	7	4	16
24	8	0	8	64
25	8	0	8	64
Sl.No	**X_1**	**X_2**	**$d= X_1- X_2$**	**d^2**
26	8	3	5	25
27	8	0	8	64
28	10	7	3	9
29	10	9	1	1
30	7	0	7	49

$\sum d = 157$

$\sum d^2 = 1033$

n = 30 (i.e. Total number of observations)

$$đ = \frac{\Sigma d}{n} = \frac{157}{30} = 5.233$$

$$S.D = \left\{ [\Sigma d^2 - \frac{(\Sigma d)^2}{n}] / [n-1] \right\}^{½} = 2.699$$

$$\frac{S.D}{\sqrt{n}} = \frac{2.699}{5.477} = 0.493$$

$$t = \frac{đ}{S.D / \sqrt{n}} = \frac{5.233}{0.493} = \mathbf{10.615}$$

From [illegible] at 5% (0.0[illegible]s significan[illegible]d to the t[illegible]s H_0 (no differenc[illegible]othesis H_1 (differen[illegible]treatment is effecti[illegible]

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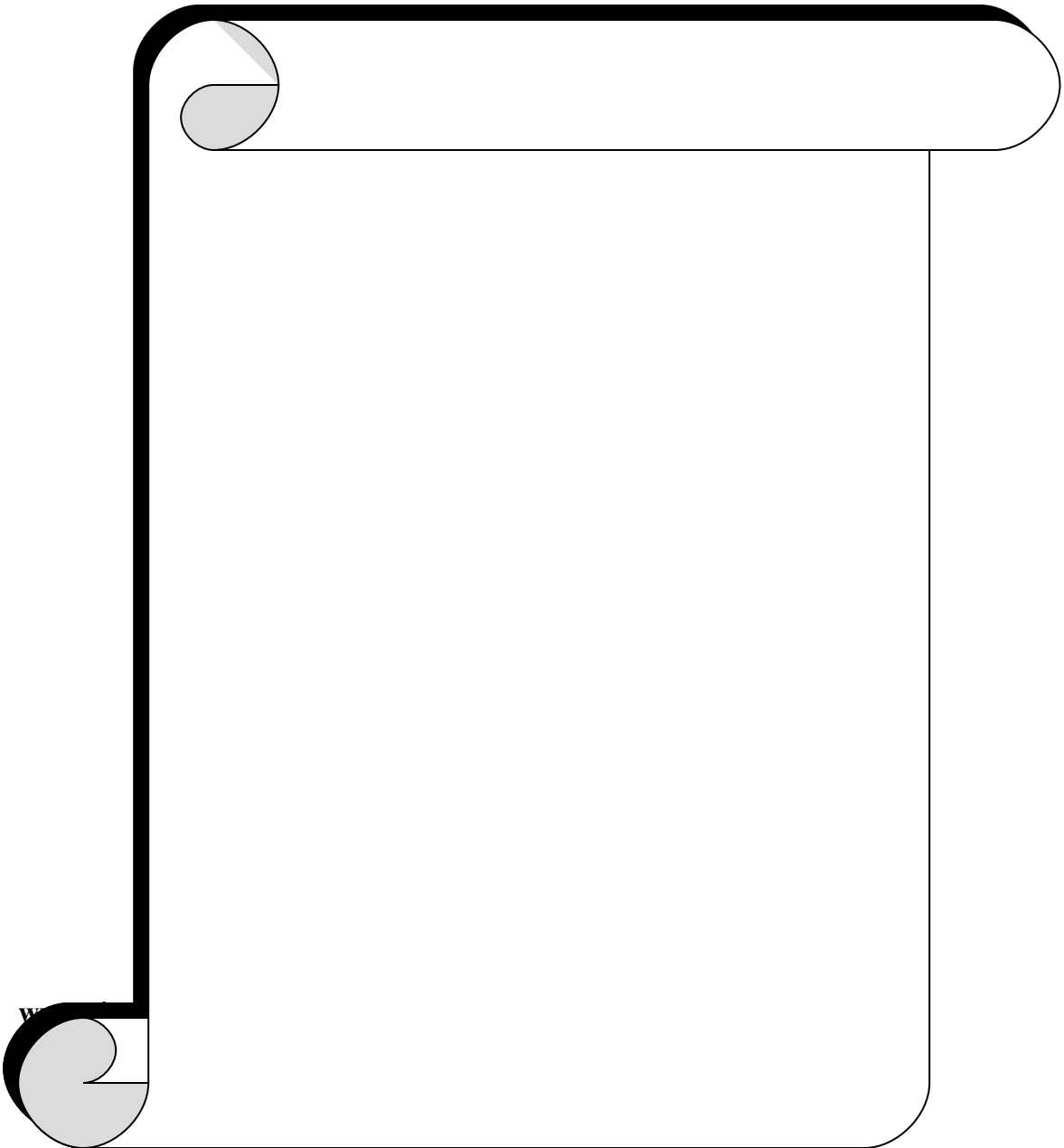
DISCUSSION

In order to arrive at a valid conclusion, I am indebted to discuss some of the findings that have evolved out of this study. The discussion that follows is exclusively based on the observation and results presented in the former section. Firstly, to discuss about the various attributes involved in this study.

1. Age incidence: Urinary calculi is found to occur more among the age group 40-50 i.e, 43.33%.
2. Sex incidence: 83.33% were males.

3. Distribution of clinical features: 80% had loin pain, 60% had abdominal pain and 50% had dysuria when first came for the treatment.
4. Distribution of patients according to the location of calculi : Among patients taken for study 90% were having stones in kidneys only. 6.67% had stones both in kidneys and UVJ and 3.33% had stones in UVJ.
5. Distribution according to the side affected: 50 % bilateral, 23.33% right sided and 26.67% left sided.
6. Order of effective medicines: A single medicine cannot be said as much effective for Urolithiasis when compared to others, which emphasizes the significance of individualization in homoeopathy.
7. Evaluation of change in disease criteria :
    a. Loin pain: out of 24 patients presented with loin pain before treatment, 58.33 % were cured and 41.67% were improved after treatment.
    b. Abdominal pain: out of 18 patients presented with abdominal pain before treatment, 88.89 % were cured and 11.11% were improved after treatment.
    c. Dysuria: Out of 15 patients with dysuria before treatment, 86.67 % were cured and 13.33% were improved after treatment.
    d. Haematuria: 2 patients presented with haematuria were completely cured after treatment.
    e. Nausea and vomiting: 1 patient presented with nausea and vomiting cured after treatment.



CONCLUSION

- From the evaluation of results obtained after the statistical analysis of the pre-treatment and post-treatment disease intensity scores, it is obvious that anti miasmatic medicines selected on the basis of the totality of symptoms are highly effective in the management of Urolithiasis.
- The mental generals and physical generals should be given prime importance.

- The tendency to the recurrence of calculi can be controlled/eradicated by the exact simillimum.
- Psora and Sycosis are found to be the predominant miasms in urolithiasis.
- The other observed facts in this study are the maximum age incidence (40 to 50 years), sex incidence (83.33% males) highlights some of the risk factors of the disease.
- Antimiasmatic deep acting constitutional medicines like Lycopodium, Nux vomica, Sulphur, Pulsatilla, Silicea, Stapysagria etc were found to be effective for controlling both the acute attacks and also for preventing recurrence, when given after strict individualisation.
- Many cases, which are recommended to do surgery, can be effectively treated with homoeopathic constitutional medicine.
- It can also be claimed that homoeopathy is far more cost effective when compared with expensive drugs and other procedures like lithotripsy used in other systems of medicines.

To conclude, limited reliability can only be guaranteed with such a study involving a chronic disease, with 30 cases, for two year period. A long term follow-up study will be more reliable as the disease is exhibiting recurrence. Comparative studies involving other systems of medicine can also be accomplished with better results.

Many great truths have had their rise, acceptance and period of sway, followed by a long period of decline and obscurity; but never has a, great truth been lost. There is always a "Remnant in Israel" who survive to hold the truth committed to them as a precious possession and cherish it until a revival comes.

In the first aphorism of the Organon Dr. Hahnemann declares that the "physician's high and only mission is to restore the sick to health, to cure, as it is termed".

In the second aphorism of the Organon, Hahnemann gives an adequate and satisfying definition for an ideal cure:" "The highest ideal of cure is rapid, gentle and permanent restoration of the health, or removal and annihilation of the disease in its whole extent, in the shortest, most reliable and most harmless way, on easily comprehensible principles."

The abandonment of the ideal of cure by the general profession and the disap an that cur pursued

The Hah rinciple of symptom dazzling accompli has been passing t there are signs of eaches, is beginnin f modern medical damental postulate opathy is gradually

REFERENCES

1. Herbert A. Roberts, M.D "The principles and Art of Cure by Homœopathy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XXII, Page 183, Reprint Edition, 1999.

2. S. P. Dey "Dey's Essentials of principles and practice of homoeopathy", Dr. Mrs Sabita Rani Dey, Kolkata, Page 104, 105, Third Edition 200, Reprint 2005.
3. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VIII, Page 95, Student's Economy Edition, Reprint Edition, 1998.
4. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VIII, Page 96, Student's Economy Edition, Reprint Edition, 1998.
5. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VIII, Page 97, Student's Economy Edition, Reprint Edition, 1998.
6. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VIII, Page 98, Student's Economy Edition, Reprint Edition, 1998.
7. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 9, Reprint Edition, 2005.
8. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their

peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Pages 9 and 10, Reprint Edition, 2005.

9. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 11, Reprint Edition, 2005.

10. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Pages 32 and 33, Reprint Edition, 2005.

11. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 33, Reprint Edition, 2005.

12. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 33, Reprint Edition, 2005.

13. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 39, Reprint Edition, 2005.

14. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 43 and 44, Reprint Edition, 2005.

15. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 12, Reprint Edition, 1998.

16. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 13, Reprint Edition, 1998.

17. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 15, Reprint Edition, 1998.

18. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 16, Reprint Edition, 1998.

19. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 17, Reprint Edition, 1998.

20. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 19, Reprint Edition, 1998.

21. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 28, Reprint Edition, 1998.

22. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 36, Reprint Edition, 1998.

23. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 41, Reprint Edition, 1998.

24. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Pages 54 and 55, Reprint Edition, 1998.

25. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 58, Reprint Edition, 1998.

26. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 59, Reprint Edition, 1998.

27. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 66, Reprint Edition, 1998.

28. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 67, Reprint Edition, 1998.

29. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 85, Reprint Edition, 1998.

30. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 90, Reprint Edition, 1998.

31. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 91, Reprint Edition, 1998.

32. J.H. Allen "The Chronic Miasms - Psora and Psuedo-Psora", B. Jain Publishers Pvt. Ltd, New Delhi, Page 97, Reprint Edition, 1998.

33. Herbert A. Roberts, M.D "The principles and Art of Cure by Homœopathy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XXXI, Page 241, Reprint Edition, 1999.

34. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VIII, Page 87, Student's Economy Edition, Reprint Edition, 1998.

35. Dr. Proceso S. Ortega "Notes on the Miasms", National Homoeopathic Pharmacy, New Delhi, Chapter XVII, Page 195, First English Edition, 1980.

36. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter VI, Page 74, Student's Economy Edition, Reprint Edition, 1998.

37. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter IV, Page 39, Student's Economy Edition, Reprint Edition, 1998.

38. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New

Delhi, Chapter VIII, Page 87, Student's Economy Edition, Reprint Edition, 1998.

39. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XI, Page 151, Student's Economy Edition, Reprint Edition, 1998.

40. James Tyler Kent "Lectures On Homoeopathic Philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Lecture XXXII, Page 203, Low Priced Edition August 2002, Reprint Edition, 2004.

41. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XI, Page 153, Student's Economy Edition, Reprint Edition, 1998.

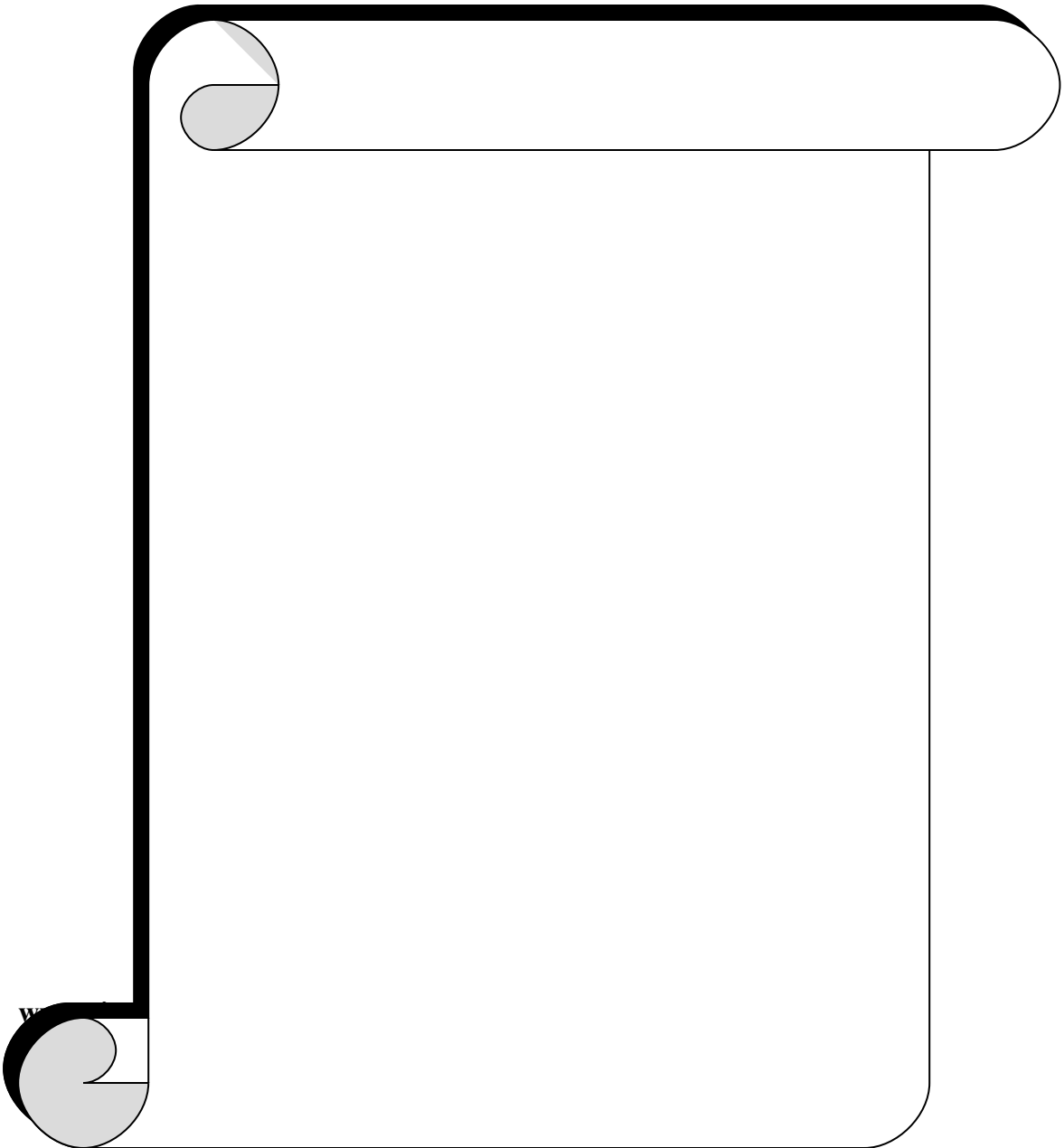
42. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XI, Page 154, Student's Economy Edition, Reprint Edition, 1998.

43. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 125, Reprint Edition, 2005.

44. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Chapter XIII, Page 184, Student's Economy Edition, Reprint Edition, 1998.

45. Richard Huges "The Principles and Practice of Homoeopathy", B. Jain Publishers Pvt. Ltd, New Delhi, Lecture 1, Page 7, Reprint Edition, 2004.

46. Dr. Samuel Hahnemann, Translated from the second Enlarged German Edition of 1835 by Louis H. Tafel "The Chronic Diseases – Their peculiar Nature And Their Homoeopathic Cure", B. Jain Publishers Pvt. Ltd, New Delhi, Page 120 and 121, Reprint Edition, 2005.



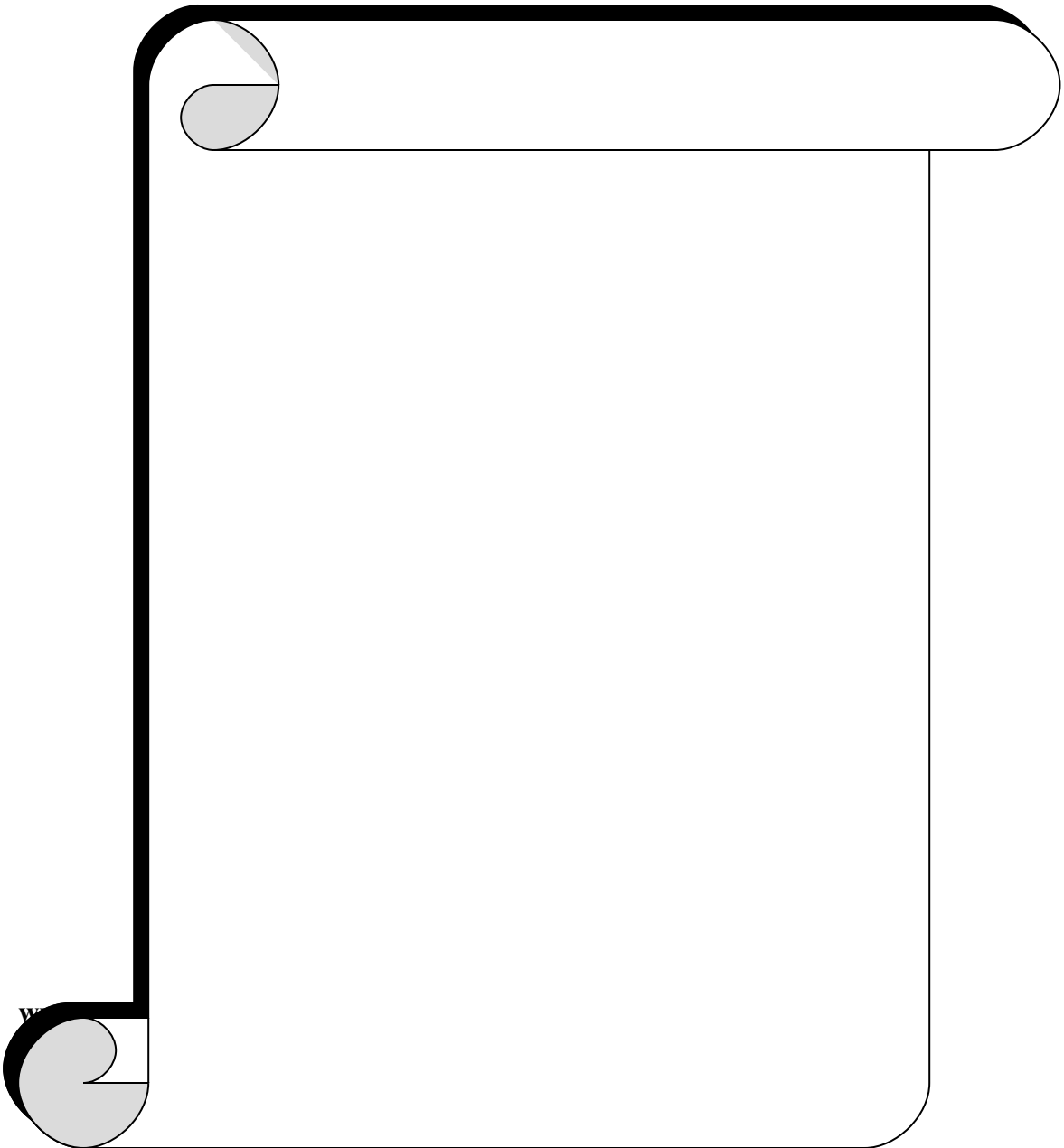
BIBLIOGRAPHY

1. Dr. Samuel Hahnemann, Translated from the fifth edition with an appendix by R.E.Dudgeon and introduction by James Krauss,M.D.

"Organon Of Medicine", B. Jain Publishers Pvt. Ltd, New Delhi, Introduction, Low Priced Edition, August 2002.

2. Stuart Close "The Genius Of Homoeopathy – Lectures and Essays on Homoeopathic philosophy", B. Jain Publishers Pvt. Ltd, New Delhi, Student's Economy Edition, Reprint Edition, 1998.
3. Henry Gray "Anatomy of the Human Body", Twentieth Edition, Thoroughly revised and re-edited by Warren H. Lewis illustrated with 1247 Engravings, 1918.
4. Dr. Samuel Hahnemann, Translated from the fifth edition with an appendix by R.E.Dudgeon, B. Jain Publishers Pvt. Ltd, New Delhi, Preface to the second edition, Low Priced Edition, August 2002.
5. Harrison's Principles Of Internal Medicine - 15th Edition, Part Ten-Disorders Of Kidney And Urinary Tract, 279- Nephrolithiasis.
6. B K Mahajan, "Methods in Biostatistics For Medical Students and Research workers", Jaypee Brothers Medical Publishers P. Ltd, New Delhi, 6th Edition.
7. Dr. Subrata Kumar Banerjea, "Miasmatic Diagnosis – Practile tips with clinical comparisions", B. Jain Publishers Pvt. Ltd, New Delhi, Revised Edition, 2003.
8. www.emedicine.com
9. www.medlineplus.com
10. www.truestarhealth.com
11. www.diagnose-me.com
12. www.chennaionline.com/health/Homoeopathy
13. www.icm.tn.gov.in/dengue/Renal%20stone/review
14. www.thefreedictionary.com
15. www.mayoclinic.com

16. www.aafp.org/afp/20010401/contents.html
17. www.kidney.niddk.nih.gov/kudiseases/pubs/stonesadults/index.htm
18. http://en.wikibooks.org/wiki/Human_Physiology/The_Urinary_System
19. www.medicinenet.com



APPENDIX

2 Model Cases
Master Chart

MODEL CASE - 1
CASE RECORD

NAME OF PATIENT:	**RADHAKRISHNAN**
AGE:	**38**
SEX:	**MALE**
RELIGION:	HINDU
OCCUPATION:	Manual labour
INCOME:	
ADDRESS:	Aparna, Santhimoola, Malayinkeezhu, Trivandrum.

1. PRESENTING COMPLAINTS

- Pain^{++} from loin to groin (< since 1 month).

  Stitching type of pain especially on left side.

  3-4 times in a week

- Distension of abdomen with flatulence with eructations.
  < Flatulent foods, eating.
  > Passing flatus^{++}

- Low back ache from prolonged sitting or standing.

2. HISTORY OF PRESENTING COMPLAINTS

Complaints started seven years back as severe right loin to groin pain and vomiting when he was abroad (Gulf). Took allopathic treatment where it was diagnosed as kidney stone. Took ayurvedic treatment for one year. Pain was relieved and a stone was passed out. Then discontinued all treatments. One and half year's back allopathic treatment was started again; took USS and found to have bilateral renal calculi (Right 4.8 mm, Left 4.8 mm). Pain ameliorated. Loin pain aggravated since one month.

3. HISTORY OF PAST ILLNESS

No	Age/Year	Illness, Trauma, Fright, Burns, Surgery, Exposures, Vaccinations etc.	Treatment Adopted	Remarks
1	22 Yrs of age	Appendicitis	Surgery	>

4. FAMILY HISTORY

- Asthma
- Autoimmune diseases
- Cancer
- Diabetes mellitus
- Eczema
- Epilepsy
- Hansen's disease
- Hypertension
- Insanity
- Koch's disease
- Psoriasis
- Rheumatism - Mother
- Venereal disease
- Parkinsonism - Father

5. PERSONAL HISTORY

1. **Life situation:**

Place of birth:	Malayinkeezhu
Religion:	Hindu
Education:	9th standard
Occupation:	Manula labourer
Economic Status:	Poor
Nutritional Status:	Moderate
Social status:	Moderate
Marital Status:	Married at the age of 25, having 2 children

2. Habits / Addictions / Hobbies: Non-Veg

3. Domestic Relations: Good

4. Sexual Relations: Married – having 2 children

5. Milestones of Development:

6. Vaccination:

6. PHYSICAL GENERALS

Appetite:	Good.
Thirst:	Good.
Sleep:	Easily wakes up from slightest noise or touch.
Dreams:	Snakes.
Bowels:	Regular (desire for stool soon after eating)
Urine:	Normal
Sweat:	Increased

Reaction to

	Aversion	Desires	Intolerance	Aggravation	Amelioration
Time					
Thermal					
Season		Dry cold			
Materiological					
Places					
Air/Fanning					
Clothing					
Covering	✓				
Bathing		Cold bathing			
Food/Drinks		Warm food and drinks	Oily food		
Undigested					
Touch/Pressure					
Posture					
Motion					
Sleep		On back			
Sex					
Spl. Senses					
Eliminations					
Menses					

Constitution

Physical Make up	Temperament	Tendencies/ Diathesis/ Disposition	Thermal	Side affinity
		Flatulence Calculi	Hot	

7. PSYCHIC FEATURES

Anger from contradiction^{++} ; Punctual ; Fear of dogs.

8. REGIONALS

- Occasional head ache from fault in diet.
- Tongue is clean and moist.
- Flatulent dyspepsia.

9. PHYSICAL EXAMINATIONS:

GENERAL:

- No Pallor
- Not Icteric
- No Cyanosis
- No Clubbing
- No Lymphadenopathy
- No Oedema
- No Pigmentation

SYSTEMIC:

No abnormalities detected.

10. NUMERICAL TOTALITY

- Pain^{++} from loin to groin.

  Stitching type of pain especially on left side.

  3-4 times in a week

- Distension of abdomen with flatulence with eructations.
  < Flatulent foods, eating.
  > Passing flatus^{++}
- Low back ache from prolonged sitting or standing.
- Easily wakes up from slightest noise or touch.
- Dreams - Snakes.
- Desire for stool soon after eating
- Desires - Dry cold season

- Desires - Cold bathing
- Desires - Warm food & drinks
- Aversion - Covering
- Intolerance - Oily food
- Desires - Sleep On back
- Anger from contradiction++
- Punctual
- Fear of dogs

11. ANALVSIS OF SYMPTOMS

1. Symptoms of Disease (Diagnostic Totality)

- Pain^{++} from loin to groin.
- Paroxysmal attack of pain.
- History of renal calculi.

Provisional Diagnosis

Urolithiasis.

Investigations

URINE RE: Albumin- Trace, Pus cells- 1-2, Epithelial cells- 1- 2.

USS ABDOMEN: On 26, December 2005

Impression: Fatty Liver.
Bilateral small Renal Calculi.
No hydronephrosis.

Final Diagnosis

Bilateral Renal Calculi.

2. Symptoms of the Patient

Generals

- Anger from contradiction++
- Punctual
- Fear of dogs
- Easily wakes up from slightest noise or touch.
- Dreams - Snakes.
- Desires - Dry cold season
- Desires - Cold bathing
- Desires - Warm food & drinks
- Aversion - Covering
- Intolerance - Oily food

Particulars

- Pain++ from loin to groin.
- Stitching type of pain especially on left side.
- Distension of abdomen with flatulence with eructations.
- < Flatulent foods, eating.
- > Passing flatus++
- Desire for stool soon after eating
- Low back ache from prolonged sitting or standing.

12. EVALUATION OF SYMPTOMS

Mental Generals

- Anger from contradiction++
- Punctual
- Fear of dogs

Physical Generals

- Easily wakes up from slightest noise or touch.
- Dreams - Snakes.
- Desires - Dry cold season
- Desires - Cold bathing
- Desires - Warm food & drinks
- Aversion - Covering
- Intolerance - Oily food

Particulars

- Pain++ from loin to groin.
- Stitching type of pain especially on left side.
- Distension of abdomen with flatulence with eructations.
- < Flatulent foods, eating.
- > Passing flatus++
- Desire for stool soon after eating
- Low back ache from prolonged sitting or standing.

13. REPERTORIAL TOTALITY

Symptom	Rubric
Anger from contradiction++	Mind – Anger - contradiction from.
Fear of dogs	Mind – Fear – dogs of
Easily wakes up from slightest noise or touch.	Sleep – Waking – noise – slight noise from
Dreams - Snakes.	Dreams - Snakes.
Desires - Cold bathing	Generalities – bathing – cold bathig – desire for
Desires - Warm food	Generalities – food and drinks – warm food - desire.
Desires - Warm drinks	Generalities – food and drinks – warm drinks – desire
Aversion – Covering	Generalities – covers – aversion to
Intolerance - Oily food	Generalities – food and drinks – oil - agg.
Stitching type of pain especially on left side.	Kidney – Pain – stitching - left.
< Flatulent foods	Generalities – food and drinks – flatulent food - agg.
<Eating	Abdomen – Flatulence - eating.
Desire for stool soon after eating	Rectum– urging – eating after.

Sum of degrees (sort:spt)

This analysis contains 151 remedies and 13 symptoms.
Intensity is considered

1. MIND - ANGER - contradiction; from	2	37
2. MIND - FEAR - dogs, of	1	22
3. SLEEP - WAKING - noise - slight noise, from	1	36
4. DREAMS - SNAKES	1	21
5. GENERALS - BATHING - cold bathing - desire for	1	17
6. GENERALS - FOOD and DRINKS - warm drinks - desire	1	35
7. GENERALS - FOOD and DRINKS - warm food - desire	1	18
8. GENERALS - FOOD and DRINKS - oil - agg.	1	3
9. GENERALS - COVERS - aversion to	1	4
10. GENERALS - FOOD and DRINKS - flatulent food - agg. - 3beans - agg. / 3cabbage - agg. / 3peas - agg. / 3sauerkraut - agg.	1	16
11. KIDNEYS - PAIN - stitching - left	1	4
12. ABDOMEN - FLATULENCE - eating, after	1	27
13. RECTUM - URGING - eating - after	1	17

	1 lyc.	2 bry.	3 ars.	4 sep.	5 aur.	6 ferr.	7 puls.	8 nux-v.	9 ign.	10 sil.	11 bell.	12 cocc.	13 aloe	14 anac.	15 arg-n.	16 chin.	17 carb-v.	18 merc.	19 sulph.
	17/7	**12/6**	**10/6**	**10/6**	**9/4**	**9/4**	**8/5**	**8/4**	**8/3**	**7/5**	**7/3**	**6/5**	**6/4**	**6/3**	**6/3**	**6/3**	**5/4**	**5/4**	**5/4**
1.	3	2	1	3	3	3	-	2	3	2	-	1	1	2	-	-	-	1	-
2.	-	-	-	-	-	-	2	-	-	-	4	-	-	-	-	3	-	1	1
3.	-	-	1	1	-	-	-	1	2	-	2	1	-	-	-	1	1	2	1
4.	-	-	-	1	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-
5.	-	-	-	1	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-
6.	2	3	3	-	-	1	-	-	-	-	1	1	-	-	-	-	1	-	2
7.	2	2	3	-	-	2	-	-	-	1	-	2	-	-	-	-	-	-	-
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9.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	3	2	1	1	-	-	1	-	-	1	-	-	-	-	-	2	1	-	-
11.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.	3	-	-	-	2	-	1	3	-	-	-	-	-	-	3	-	2	-	-
13.	-	-	-	-	1	-	-	-	-	-	-	-	3	2	-	-	-	-	1

14. MIASMATIC EXPRESSION

www.similima.com

1. PSORA:

- Dreams - Snakes.
- Desires - Warm food & drinks
- Distension of abdomen with flatulence after eating.

2. SYCOSIS:

- Punctual
- Easily wakes up from slightest noise or touch.
- Desires - Dry weather
- Stitching type of pain especially on left side.

3. SYPHILIS:

- Desires - Cold bathing
- Aversion – Covering

4. TUBERCULAR:

- Fear of dogs
- Intolerance - Oily food

15. MIASMATIC DIAGNOSIS

Predominantly **SYCOSIS**.

16. CONCEPTUAL IMAGE (Totality of Symptoms)

- Anger from contradiction
- Punctual
- Fear of dogs
- Easily wakes up from slightest noise or touch.
- Dreams - Snakes.
- Desires - Dry cold season
- Desires - Cold bathing
- Desires - Warm food & drinks
- Aversion - Covering
- Intolerance - Oily food

- Pain++ from loin to groin.
- Stitching type of pain especially on left side.
- Distension of abdomen with flatulence with eructations.
  < Flatulent foods, eating.
  > Passing flatus++
- Desire for stool soon after eating
- Low back ache from prolonged sitting or standing.

17. BASIS OF SELECTION

A tri miasmatic medicine with Sycotic predominance, hot patient preferring warm food and drinks, getting anger from contradiction, loin to groin pain with flatulent dyspepsia > passing flatus.

18. MANAGEMENT

Medical

First prescription on 10/01/2006

℞

LYCOPODIUM 200 – 1 Dose.

Accessory management

- Calculi diet.
- Diet and regimen to be followed during homoeopathic treatment according to Hahnemann.

19. FOLLOW UP:

25/04/2006

℞

LYCOPODIUM 200 – 1 Dose.

BTAB – 2 weeks (1-0-1)

08/08/2006

℞

LYCOPODIUM 200 – 1 Dose.

BTAB – 2 weeks (1-0-1)

12/09/2006

℞

LYCOPODIUM 1M – 1 Dose.

BTAB – 2 weeks (1-0-1)

1st dose of LYCOPODIUM 200 gave considerable relief for the complaint and the remedy was repeated when the symptoms reappeared. During the course of treatment 3 doses of LYCOPODIUM 200 and 1 dose of LYCOPODIUM 1M was necessary. 3rd dose of LYCOPODIUM 200 showed little action and so went for higher potency. In between these doses placebo in the form of sugar of milk and blank tablets were given liberally.

MODEL CASE - 2
CASE RECORD

NAME OF PATIENT:	**BINU KUMAR**
AGE:	**37**
SEX:	**MALE**
RELIGION:	HINDU
OCCUPATION:	Police Constable
INCOME:	
ADDRESS:	Nedumangadu, Trivandrum.

1. PRESENTING COMPLAINTS

- Frequent colicky pain^{++} from loin to groin.

  More attack on left side.

  Preceded by frequent urging to stool and urine.

- Distension of abdomen with flatulence.

- Heartburn with sour eructations.

  > Warm drinks
  > Passing flatus

2. HISTORY OF PRESENTING COMPLAINTS

Complaints started six years back as severe left loin to groin pain in the early morning. Took injection from a nearby private hospital and got relief. Last year the complaint recurred at midnight. Took allopathic treatment and got relief. Then on painkillers at each episode of colic. Six months back similar pain occurred on right side. Took USS and found to have bilateral renal calculi.

3. HISTORY OF PAST ILLNESS

No	Age/Year	Illness, Trauma, Fright, Burns, Surgery, Exposures, Vaccinations etc.	Treatment Adopted	Remarks
1	2 Yrs back	Haemorrhoids	Cryo surgery	>

4. FAMILY HISTORY

- Asthma
- Autoimmune diseases
- Cancer
- Diabetes mellitus
- Eczema
- Epilepsy
- Hansen's disease
- Hypertension
- Insanity
- Koch's disease
- Psoriasis
- Rheumatism
- Venereal disease

5. PERSONAL HISTORY

1. Life situation:

Place of birth: Nedumangadu

Religion: Hindu

Education: PDC (fail)

Occupation: Police constable

Economic Status: Moderate

Nutritional Status: Good

Social status: Moderate

Marital Status: Married at the age of 34, having 3 children

2.Habits / Addictions / Hobbies: Non-Veg, Occasional Drinker

3. Domestic Relations: Good

4. Sexual Relations: Married – having 3 children

5. Milestones of Development:

6. Vaccination:

6. PHYSICAL GENERALS

Appetite: Normal (sometimes with loathing for food)

Thirst: Normal (8 to 9 glasses of water per day)

Sleep: Good.

Dreams: As if elephants are chasing.

Bowels: Regular (once or twice in the morning)

Urine: Normal

Sweat: Normal^{+}

Reaction to

	Aversion	Desires	Intolerance	Aggravation	Amelioration
Time					
Thermal					
Season					
Materiological					
Places					
Air/Fanning		✓			
Clothing					
Covering		✓			
Bathing					
Food/Drinks		Fish^{+}, Meat^{+}		Cold Drinks	Warm Drinks
Undigested					
Touch/Pressure					
Posture					
Motion					
Sleep					
Sex					
Spl. Senses					
Eliminations					
Menses					

Constitution

Physical Make up	Temperament	Tendencies/ Diathesis/ Disposition	Thermal	Side affinity
		Calculi	Chilly	

7. PSYCHIC FEATURES

Irritable, easily angered^{++}.

8. REGIONALS

9. PHYSICAL EXAMINATIONS:

GENERAL:

- No Pallor
- Not Icteric
- No Cyanosis
- No Clubbing
- No Lymphadenopathy
- No Oedema
- No Pigmentation

SYSTEMIC:

No abnormalities detected.

10. NUMERICAL TOTALITY

- Frequent Severe colicky pain from loin to groin.
  More attack on left side.
  Preceded by frequent urging to stool and urine.
- Distension of abdomen with flatulence.
- Heartburn with sour eructations.
  > warm drinks
  > passing flatus
- Dreams as if elephants are chasing.
- Prefers fanning.
- Prefers covering.
- < Cold drinks.
- > Warm drinks.
- Easily angered.
- Chilly.

11. ANALVSIS OF SYMPTOMS

1. Symptoms of Disease (Diagnostic Totality)

- Frequent Severe colicky pain from loin to groin.
  More attack on left side.
  Preceded by frequent urging to stool and urine.

Provisional Diagnosis

Urolithiasis.

Investigations

URINE RE: Albumin- Trace, Pus cells- 3-4, Epithelial cells- 1- 2.
USS ABDOMEN: On 27, November 2005
Impression: Fatty Liver.
Bilateral Renal Calculi.

Final Diagnosis

Bilateral Renal Calculi.

2. Symptoms of the Patient

Generals

- Easily angered^{++}.
- Dreams of Elephants chasing him.
- Prefers covering^{+}.
- Desires Fish.
- Desires Meat.
- < Cold drinks.
- > Warm drinks.

Particulars

- Frequent colicky pain^{++} from loin to groin.
- Distension of abdomen from flatulence
- Heartburn, > Warm drinks.

12. EVALUATION OF SYMPTOMS

Mental Generals

- Easily angered^{++}.

Physical Generals

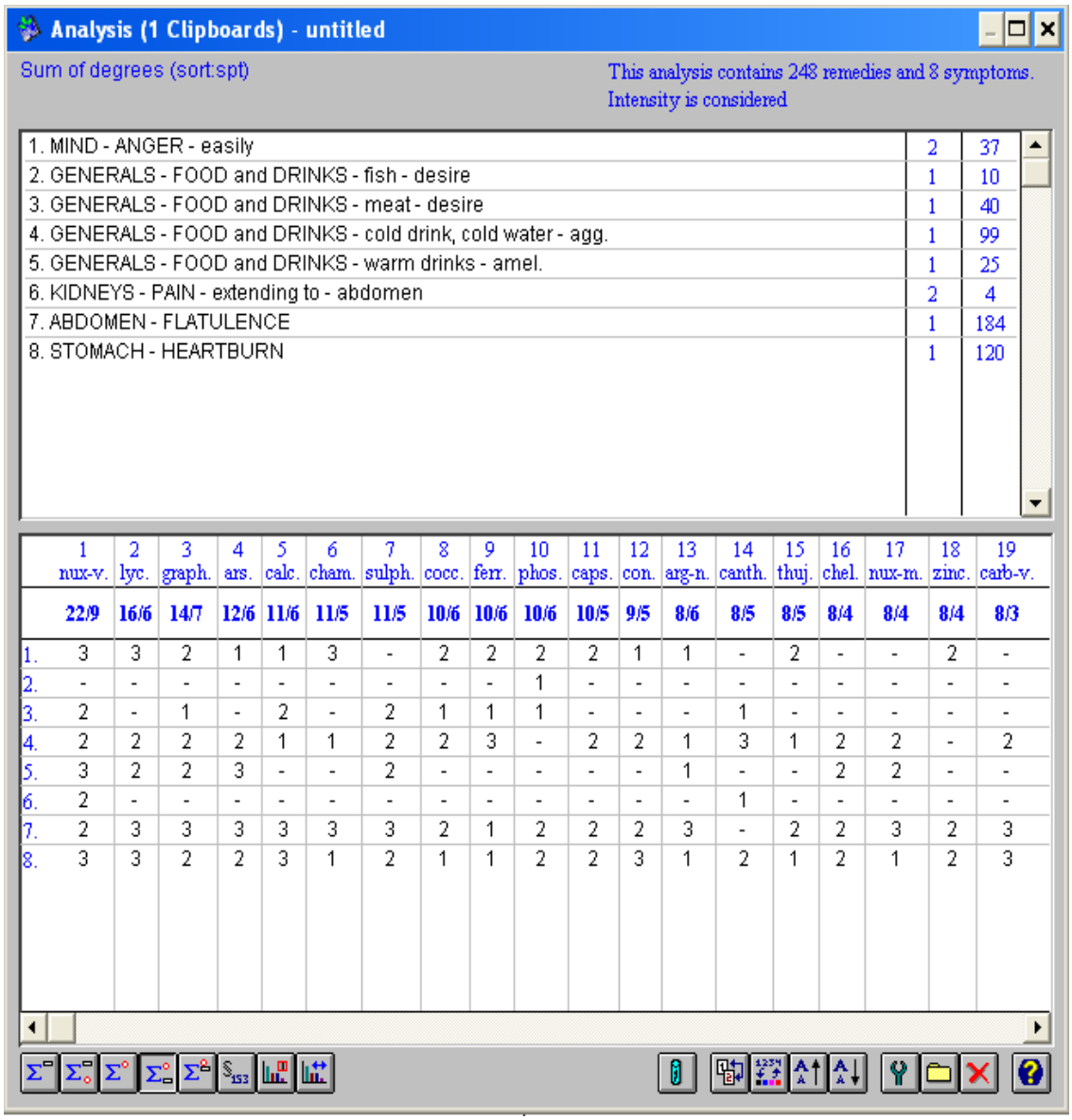
- Dreams of Elephants chasing him.
- Prefers covering^{+}.
- Desires Fish.
- Desires Meat.
- < Cold drinks.
- > Warm drinks.

Particulars

- Frequent colicky pain^{++} from loin to groin.
- Distension of abdomen from flatulence.
- Heartburn, > Warm drinks.

13. REPERTORIAL TOTALITY

Symptom	Rubric
Easily angered++.	Mind – Anger easily.
Desires Fish.	Generalities – food and drinks – fish desires.
Desires Meat.	Generalities – food and drinks – meat desires.
< Cold drinks.	Generalities – food and drinks – cold drinks agg.
> Warm drinks.	Generalities – food and drinks – warm drinks amel.
Frequent colicky pain++ from loin to groin.	Kidney – Pain extending to abdomen.
Distension of abdomen from flatulence	Abdomen – Flatulence.
Heartburn, > Warm drinks.	Stomach – Heartburn.



	1 nux-v.	2 lyc.	3 graph.	4 ars.	5 calc.	6 cham.	7 sulph.	8 cocc.	9 ferr.	10 phos.	11 caps.	12 con.	13 arg-n.	14 canth.	15 thuj.	16 chel.	17 nux-m.	18 zinc.	19 carb-v.
	22/9	**16/6**	**14/7**	**12/6**	**11/6**	**11/5**	**11/5**	**10/6**	**10/6**	**10/6**	**10/5**	**9/5**	**8/6**	**8/5**	**8/5**	**8/4**	**8/4**	**8/4**	**8/3**
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7.	2	3	3	3	3	3	3	2	1	2	2	2	3	-	2	2	3	2	3
8.	3	3	2	2	3	1	2	1	1	2	2	3	1	2	1	2	1	2	3

14. MIASMATIC EXPRESSION

1. PSORA:

- Easily angered.
- Fearful dreams.
- Prefers covering.
- Desires Meat.
- < Cold drinks.
- > Warm drinks.
- Flatulence.
- Heartburn.

2. SYCOSIS:

- > Warm drinks.
- Paroxysmal colicky pain.

3. SYPHILIS:

4. TUBERCULAR:

- Desires Meat.

15. MIASMATIC DIAGNOSIS

Predominantly **PSORIC**.

16. CONCEPTUAL IMAGE (Totality of Symptoms)

- Easily angered^{++}.
- Dreams of Elephants chasing him.
- Prefers covering^{+}.
- Desires Fish.
- Desires Meat.
- < Cold drinks.
- > Warm drinks.
- Frequent colicky pain^{++} from loin to groin.
- Distension of abdomen from flatulence.

- Heartburn, > Warm drinks.

17. BASIS OF SELECTION

Anti-psoric suited to chilly patient, gets angry easily, with colicky pain from loin to groin preceded by frequent urging to stool and urine and with flatulence.

18. MANAGEMENT

Medical

First prescription on 06/12/2005

℞

NUX VOMICA 200 – 1 Dose.

Accessory management

- Calculi diet
- Diet and regimen to be followed during homoeopathic treatment according to Hahnemann.

19. FOLLOW UP:

11/04/2006

℞

NUX VOMICA 200 – 1 Dose.

BTAB – 2 weeks (1-0-1)

08/08/2006

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NUX VOMICA 200 – 1 Dose.

BTAB – 2 weeks (1-0-1)

29/08/2006

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SULPHUR 200 – 1 Dose.

BTAB – 2 weeks (1-0-1)

1st dose of NUX VOMICA 200 gave considerable relief for the presenting complaint and the remedy was repeated when the symptoms reappeared. During the course of treatment 2 doses of NUX VOMICA 200 was necessary. 3rd dose of NUX VOMICA 200 showed little action and the symptomatology of the patient was changed. Patient developed skin complaints with much itching and thermal modality was changed towards hot. So, Sulphur 200/ 1 dose was given and patient is continuing treatment. In between these doses placebo in the form of sugar of milk and blank tablets were given liberally.