

CARNIFICATION OF THE LUNG FROM THE PRESSURE OF A MELANOTIC CANCEROUS LIVER.

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J.—aged 46, a jockey, was a patient in the Allahabad Civil Hospital from the 15th February to the 2nd March 1876. The principal symptoms were constant pain, varying in severity in the region of the liver, enlargement of the liver, ascites, tympanitis, great costiveness, dry tongue, thirst, œdema of the scrotum and ankles, sleeplessness from dyspnœa and pain, and at last delirium. Patient had lost one eye by an accident. There was also a deep lobulated or puckered ulcer in the left side of the tongue, also the result of an accident. This ulcer had no factor, was not painful, and was neither everted, papillary, nor sloughy. No notes were kept, but as far as I remember patient's previous illness had been a short one, and he had ridden in a race not very long before, and wanted to get well for other engagements. The œdema, pain, dyspnœa, and sleeplessness increased, and he died on the 2nd March 1876; and a *post-mortem* examination was held on the same day.

Externals, &c.—œdema of the lower part of the trunk, of the penis, scrotum, and lower limbs, the right leg more than the left. No jaundice; about 2 quarts of reddish fluid in the abdomen.

Brain, &c.—Much blood in the scalp; scalp adherent to skull in one place behind; skull-cap very heavy, rather thick, with a good deal of diploe; deep Pacchionian pits; sutures obliterated; arterial grooves deep. Fine membranes very cloudy on the convexity; much subarachnoid fluid; between the hemispheres adhesion in front by thickened membrane; much thin watery blood from the base; much clear fluid in the ventricles; choroid plexuses anæmic. A pea-sized cyst protrudes from the right side of the pineal gland; substance of the brain firm, anæmic, orermost; pigmentation of the pia mater in front of the medulla faint; optic nerves of equal size. One part of the white matter in the right side of the cerebellum is gritty to the knife and the finger, and appears to the eye as if the vessels were calcified.

Heart.—About 3ij of clear yellow fluid in the pericardium; right auricle full of dark clots and a large œdematous clot; left auricle contains some dark clots. A semi-decolorised fibrinous clot extends from each ventricle into its artery. The right auriculo-ventricular orifice admits four fingers, the left three. There is a large separable milk spot on the upper front left corner of the right ventricle, and another on its posterior surface above. All the valves competent and normal; right ventricle contains a large quantity of œdematous clot; intima of vessels not stained; some small thickened patches just above the aortic valves; a large one with an erosion in it in the intima of the aorta where the aorta is adherent to the pulmonary artery; one or two small patches about the mouths of the large vessels that spring from the arch; a couple of larger thickened patches close to the bifurcation. Thickness of wall of right ventricle $\frac{1}{8}$ ", of left ventricle $\frac{3}{4}$ ".

Lungs.—Both lungs free; upper lobes of right lung crepitant throughout, slightly hyperæmic, and full of froth; lower lobe deep red, perfectly airless, tough, and flesh-like; bronchial tubes pale, containing some clear mucus; both lobes of left lungs crepitant, hyperæmic; the upper lobe containing less froth than the lower; larynx and trachea pale and normal; thyroid cartilage ossified; thyroid gland colloid.

Spleen.—Measures $5\frac{3}{4}$ " \times $2\frac{2}{3}$ " \times $\frac{7}{8}$ ". Numerous capsular thickenings externally; firm, smooth, clear, pale, with follicles and trabeculæ easily seen.

Kidneys.—Capsules of the kidneys adherent. A cyst in the posterior surface of the left kidney, which is five inches

long and bulky; surface finely granular; cortex clear. In posterior edge of right kidney a large pea-sized, firm, blackish-green tumour: otherwise the same as the left.

Liver.—Measures $12'' \times 9'' \times 6\frac{1}{8}$ "; weight 12lbs 3 oz. The liver is very bulky and its surface lumpy, the lumps being of a black or variegated black and gray colour, and of all sizes from that of a turnip to that of a pin-point. There are also numerous black nodules of various sizes in the surface of the left lobe, which is very firm, and of a yellowish colour, and devoid of the large protuberances. On section of the right lobe, the tissue between the actual tumours is found to be firm and hard, and of a greyish black colour variegated throughout by light grey and yellow, and occasional connective-tissue thickenings; but in some parts the grey and yellow predominate, showing only occasional dark patches. The left lobe and the Spigelian lobe are very firm, of a pale yellow colour, with distinct acini, whose centres are of a deeper shade of yellow than their circumferences; and throughout them are scattered very numerous black grey nodules from the size of a walnut down to that of a pin's head or less. The gall-bladder contains a small quantity of thin yellow bile with particles of irregular, black, soft gall-pigment gravel.

Pancreas.—There are about half a dozen small grey nodules in the pancreas, the intervening tissue appearing normal.

Alimentary Canal.—The glands at the root of the tongue are atrophied. On the left side of the tongue, towards the tip, is an extensive deep irregular hard ulceration; the tonsils are small; the œsophagus is normal throughout; the stomach is empty, with congestion and bright extravasation along the longitudinal ridges. The pylorus is normal. There is very bright congestion and extravasation on the valvula in the duodenum, and in numerous patches in the jejunum, and in one in the ileum. Peyer's patches are still visible in the lower part of the ileum occasionally. The appendix vermiformis contains fœcal matter, and its mucous membrane is congested; the cæcum and sigmoid flexure are minutely congested; the rectum is velvety, œdematous, and slightly injected; the large intestine contains scybala.

Microscopical Examination.

1. *Of the ulcerated part of the tongue.*—To the naked eye the site of the ulcer presents no elevation or appearance of tumour. The ulcer is of a lamellar lobulated appearance. The inner faces of the lobules are partly smooth and somewhat opaquely white, partly rough and granular. A section through the former shows a covering in layers of tessellated epithelium (in whose deeper layers fluted or spinous cells are easily seen) on a mass of round cells with fine connective tissue, blood vessels, and broken ends or fragments of muscular fibres. A section through the latter (*i.e.*, a granular part of the ulcer) shows an absence of epithelium, the round cells and broken muscle reaching to the surface. A section from a normal part on the opposite side of the tongue shows a stratified flat epithelium with downward processes lying on, not round cells, but loose, open, coarse connective tissue. The round cells show no tendency to fatty degeneration. Though most of the cells are round or rounded, some are oval or somewhat spindle-shaped. Even after the addition of acetic acid a nucleus is not always seen; when it is, it is large, rounded, and single, with occasionally a nucleolus. The nucleus occupies the greater part of the containing cells. The cells are in fact granulation cells.

2. *Of the liver.*—Both the tumours and the intervening tissue are difficult to tease; and the cells are best obtained uninjured by pencilling. The predominating forms are the round and the spindle-shaped, but various other forms occur,

as may be seen in figs. 1 and 2. Each cell has a round or oval

FIGURE 1.

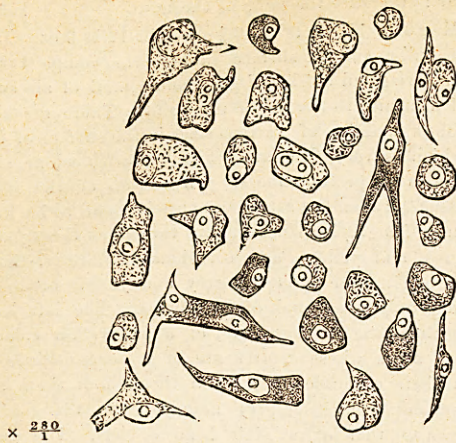
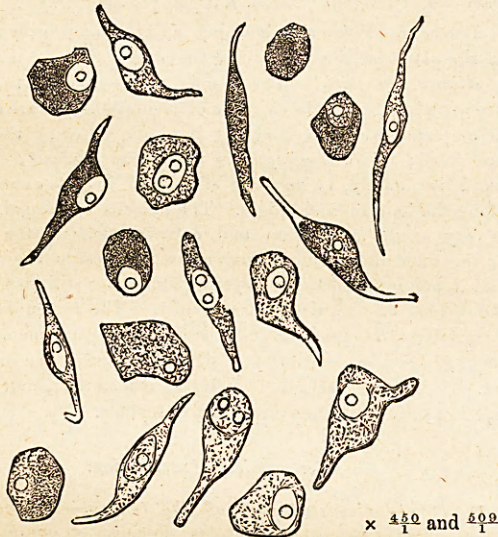


FIGURE 2.

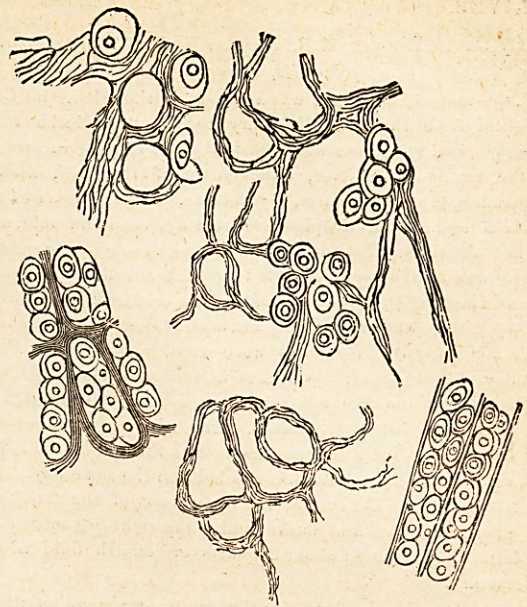


very brightly outlined nucleus and a bright round nucleolus; and some cells have two nuclei and nucleoli, or two nucleoli. In some of the pigmented cells the nucleus is just visible crammed up into a corner; in those quite full of pigment it is invisible. The pigment is of a deep yellowish brown colour. The cells in the lighter parts differ from those in the darker, only in containing little or no pigment. Many of the cells also contain fat-globules, but not abundantly, as a rule. Throughout the whole of the tumours there exists a fibrous interstitial substance of varying fineness, shown in fig. 3, to obtain a good sight of which, however, requires persevering but gentle pencilling or shaking. This stroma is what remains after the atrophy of the hepatic cells is completed.

Some of the black tumours have a slight attempt at a fibrous capsule, but the tissue immediately outside is almost as cancerous as the tumour itself. But what is remarkable is, that every part of the liver I have an opportunity of examining, even pale yellow parts, inches away from any tumour, are not only cancerous but very cancerous, scarcely less cancerous than parts in the immediate vicinity of tumours. Such a section examined under a power of 35 diameters shews (1.) That there is no increased breadth (cell-proliferation) of the portal zone. (2.) That the lobules are fatty, the oil being most abundant externally, and extending irregularly into the acinus. (3.) That (which is scarcely abnormal) the centres

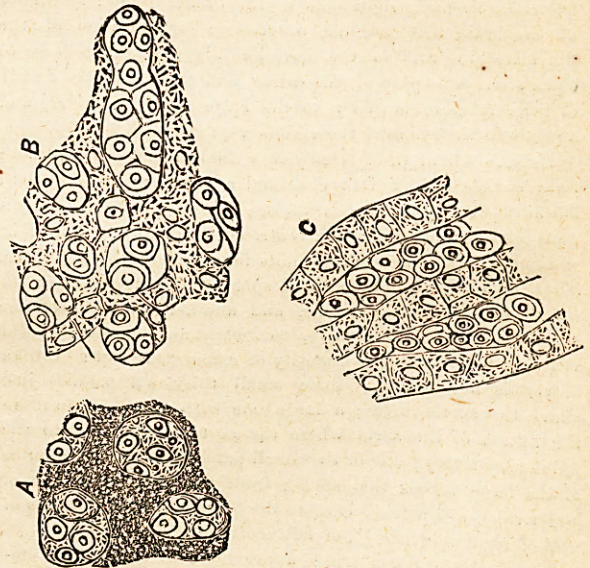
of the acini are more pigmented than the circumference.

FIGURE 3.



When a higher power is used (55-175) one is immediately struck by the curious reticular arrangement of the liver-cells, and by the extreme fineness of some of the threads of the net; while in the meshes of the net-work the same bright nuclei and nucleoli, that we have seen in the tumours, reveal themselves. In Fig. 4, A shows tolerably well this appearance

FIGURE 4.



under a power of 280. Hitherto we can only recognise the hepatic substance by its peculiar brown finely granular appearance; but on the addition of strong glycerine, which prevents the oil-globules from interrupting the view, the liver cells with their nuclei come out clearly and distinctly (Fig. 4, B & C). The cancer-cells, with their brilliantly obtrusive nuclei and nucleoli in the meshes of the net-work, contrast strongly with the soberly granular liver cells with their unobtrusive nuclei and occasional nucleoli, which form the net-work. The hepatic wall between two of these cancer-depôts is sometimes formed of a single attenuated liver-cell. In no case is there any irre-

gular burrowing of cancer-cells into hepatic tissue, forming islands of hepatic cells amidst cancer: on the contrary there is everywhere a definite boundary between cancer and liver. The boundary surrounding a group of cancer-cells sometimes appears to have a double contour; but, generally, the boundary appears only to be formed by the liver-cells. The larger vessels seen in a section are normal and contain only blood-dises and the usual granular detritus. The appearances are, therefore, not those of cancer rushing in amid the hepatic cells and devouring them irregularly; but of a net-work of cancer-cylinders interlacing with a net-work of hepatic cylinders; the cancer-cylinders by the pressure of their increasing bulk causing the gradual atrophy and degeneration of the hepatic cylinders.

Remarks.—The whole of the organs of the body were examined, but only three were found to be affected—the liver, the pancreas, and the right kidney. Every inch of the œsophagus was examined. The reason for mentioning this particularly is as follows: That part of the œsophagus, which lies in the embrace of the diaphragm, is one of the three seats of election of œsophageal cancer. Now, it often happens in autopsies, that the œsophagus is cut through below the diaphragm in taking out the stomach, and cut through above the diaphragm in taking out the contents of the chest; so that the part in the diaphragm remains unexamined. Virchow considers that if this part of the œsophagus were more frequently examined, cases of primary cancer of the liver would be even more unfrequently reported than they are. The ulcer of the tongue has been shown not to be cancerous,—to be a normally healing ulcer.

The kidney is evidently the latest affected in this case. Looking at the descriptions already given, it seems to me just as evident that the affection of the pancreas also is secondary to that of the liver. But the strongest argument for this is the melanotic character of the tumours. Melanotic tumours of the liver only are not very uncommon; but I can find no reference to such a thing as a melanotic tumour formed in the pancreas alone.

But is this a case of cancer at all? For there are some who consider all so-called pigmented cancers of the liver to be really sarcomata. Thus Payne, in "Jones and Sieveking," says: "Most, if not all such, are cases of sarcoma." The following facts, already mentioned, show conclusively that the case under consideration is one of melanotic carcinoma and not one of melanotic sarcoma, *viz.*, (1). The polymorphism of the cells; (2). The existence of an intercellular *tissue*; (3). The extensive diffusion of the disease outside of tumour limits; (4). The cylindrical arrangement of the cells of this diffused disease. The cells of a sarcoma are all of one kind, or if of two or three kinds, the two or three kinds are not indiscriminately mixed up; and they are never polymorphous. A sarcoma, whether simple or alveolar, never has *formed fibrous tissue* as a stroma or interstitial substance.

Having settled that this is a case of cancer, we have now to consider from what tissue in the liver it has arisen. If we could look stereoscopically through and through a liver lobule during life, we should see that it was composed of systems of interlacing cylinders. The cylinders formed of hepatic cells, and those formed by the capillary blood vessels, are of nearly equal size; besides them we should see the lymphatic and the biliary vessels. In the lobule we should see a little connective tissue, and more outside the lobule. If the cancer cells were derived from the connective tissue, we should, in the parts more remote from tumours, find them pushing their way into the lobule from the portal zone, pushing their way in between the hepatic radii of the lobulus, but instead of that we find a peculiar net-like arrangement. If the cancer-cells were directly derived from the liver-cells, we should find the hepatic

cylinders transformed into cancer cylinders, separated from each other by the vascular cylinders. But in this case we find that we have the hepatic cylinders non-cancerous,—only atrophied,—but interlacing with cancer-cylinders instead of blood vessels; there is no irregular intermingling of cancer and liver, only smooth cancer-cylinders interlacing with hepatic-cylinders. The conclusion is inevitable that the cancer-cells are actually packed in the blood-vessels, and have been derived from the endothelium of the vessels in which they lie. But why select the endothelium of the blood-vessels instead of that of the lymphatics or of the biliary ducts? The answer is simple,—because of the pigmentation. It is easy to see how the pigment was derived from the blood shut up in vessels obliterated at various points by the proliferation of their endothelium. In this man's liver, therefore, we have, just as in the normal liver, hepatic-cylinders interlacing with vascular-cylinders,—only in this case, instead of blood, the vessels contain cancer-cells formed by the proliferation of their endothelium; and the vessels are so distended by these cells that they have by pressure caused the atrophy of the hepatic-cylinders. If any one who reads this possesses Rindfleisch's "Pathological Histology," he will find—in Fig. 151—a figure which might have been drawn from the liver I am describing. It is to illustrate the origin and structure of "pigmented radiating cancer of the liver." It shows the hepatic-cylinders being gradually reduced by pressure to mere fibrous cords to form part of the stroma; and it shows the endothelium of the vessels actually in course of proliferation. It gives a better idea of what I have been trying to describe than the drawings I have attempted.

NOTES ON INFANTILE DISEASES OF INDIA.

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(Continued from page 92.)

DEAF AND DUMB.

A fragile, blue-eyed, flaxen-haired boy, 23 months old, beyond pronouncing the words "ayah" or "mamma" indistinctly, never speaks. The family are healthy, the parents not related: this is the 7th child, and although the mother was weakly during pregnancy, she nursed 4 months, then tried the bottle. Starting teeth about this time, he did very well, until the 18th month, which happened to be March, when a mild convulsion was associated with the eye-teeth. Always inclined to be silent, he became more so after this, besides suffering from occasional vomiting and diarrhœa, difficult to control. The tongue and palate appear right, the father is confident the child is not deaf, and as regards intelligence, he is sharp enough. The "desire of the moth for the star, of the night for the morning," gives some idea of the restless egotism of such patients who are unreasonably exacting, as if the whole house, and the rest of the children (noisy, merry little people to-day, dressing up a long suffering dog in a bonnet, socks and shawl) were mere cyphers in comparison. The silent boy makes signs enough, his heart beats faintly, he breathes quietly, and remains so still all night, that the bed-clothes are not disturbed. As a rule, he prefers to play by himself. Though the appetite is very capricious, he takes eggs, beef juice and port wine fairly well, and there is every reason to hope that as bodily health and strength improve, we shall have the pleasure of hearing him talk. A child, as a rule, is dumb, not because his speaking organs are defective, but because being deaf, he hears nothing to copy or to imitate. All deaf from birth must be dumb.

In certain countries, where the inhabitants are weakly, and in small valleys or communities, where inter-marriages are com-