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Measurement of Vaginal Flexibility and its Involvement in the Sexual Health of Women

Angelo do Carmo Silva Matthes* and Gustavo Zucca Matthes

Coordinator of Gynecology, University of Ribeirao Preto, Ribeirao Preto, Sao Paulo, Brazil

Abstract

Objectives: The present study was to determine vaginal flexibility in order to show that there is a limit to the elasticity and therefore to the distention of the organ, which may suffer traumatism during sexual relations, leading to a medical syndrome that causes suffering and a poor quality of life.

Methods: A transversal study of the size of the vagina it was conducted. Sexually active women aged 18 to 50 years who sought gynecological care at the hospital of the medical college of UNAERP and gave written informed consent to participate in the study. The vagina was measured with a speculum, which was then withdrawn. The size was registered. The vagina was then penetrated with a calibrated device until the patient reported discomfort. The size was registered. Vaginal flexibility was calculated as the difference between the measurement of the distended vagina and the value obtained by speculum examination.

Results: A hundred twenty vaginas were measured, 104 of them without prolapses and 16 with prolapses. The size of the distended vagina was about 13 ± 3 cm. The flexibility of the vagina without prolapses was about 3 ± 2.5 cm when measured with the speculum and the flexibility of the vagina with prolapses ranged from 5.5 to 8.0 cm.

Conclusion: There is a woman's vagina flexibility limit and a fully extended capacity beyond which the vagina suffers injury. Knowing the size of the fully extended vagina, the gynecologist can guide the patient with deep dyspareunia to engage in sexual positions that prevent full penetration of the penis and can diagnose and treat women with RSVS for a better sexual quality of life. The presentation of the measuring device of the vaginal canal is intended to allow gynecologists to measure their patient's vagina.

Keywords: Vagina; Dyspareunia; Pelvic pain; Coitus; Relative short vagina syndrome

Introduction

The management of chronic pelvic pain frustrates physicians faced with the problem because its physiological path is poorly understood and its treatment is often unsatisfactory and limited to temporary relief of symptoms [1].

According to the Institute of Medicine report "Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research," the costs of chronic pain to society range from $560 to $635 billion annually, a number that includes direct healthcare costs and lost productivity [2]. Chronic, non-cancer-related pain is already considered to be a major public health issue and a financial burden for the aging population. Chronic sexual pain should also be included in any questionnaires or surveys that inquire about chronic pain since there are ample data showing that dyspareunia impacts quality of life (QOL) like other chronic pain conditions [3]. Many women with pelvic pain also have pain during sex relations, called dyspareunia [4].

Relief of dyspareunia and the subsequent improvement of QOL have widespread implications for the aging population since sexual pain is highly prevalent among postmenopausal women. Up to 50% of postmenopausal women will report symptoms of vaginal atrophy, particularly sexual pain, which results from loss of adequate lubrication during intercourse [3].

When pain occurs in the fundus of the vagina it is called depth dyspareunia and when it occurs at the vaginal entrance it is called superficial dyspareunia. As Binik [5] states, "it seems highly likely that there are different syndromes of dyspareunia" one of them being relative short vagina syndrome (RSVS) causing depth dyspareunia [6].

This syndrome consists of a group of signs and symptoms associated with the same clinical condition, i.e., depth dyspareunia. In this condition, the vagina is too small when penetrated by a penis of any size, although for the woman, who reports deep pain after penetration, the penis is too large, indicating that her vagina is too short.

Depth dyspareunia is primary when there is no organic cause involved, except incompatibility of penis size with maximum size of the distended vagina, and secondary if there is an organic cause, when vaginal distention does not necessarily occur but the penis touches an affected site, such as a focus of endometriosis.

The main sign of RSVS is the sign of Matthes [6]. In the gynecologic exam, when the doctor pushes up the cervix the sign is positive when the patient reports pain and negative if there is no pain. A smooth vagina without folds can also be a sign related to RSVS.

The patients report symptoms such as pelvic pain when walking, lack of desire, aversion to sexual relations, excuses such as headache in order to avoid sexual relations, complaints about marital relations, low self-esteem, as well as psychiatric complaints such as depression and anxiety. It is important to emphasize that chronic pelvic pain,

***Corresponding author:** Angelo do Carmo Silva Matthes, Coordinator of Gynecology, University of Ribeirao Preto, Ribeirao Preto, Sao Paulo, Brazil, Tel: 5516 36259229; E-mail: amatthes@unaerp.br

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depression and anxiety are never causes of depth dyspareunia, but rather consequences of this condition. A virgin woman may have these complaints due to various reasons other than depth dyspareunia, which, obviously, would only be present when she is no longer a virgin.

The etiology is the distension or stretching of the vaginal fundus including the parametrial ligaments, especially the uterosacral one, in addition to pressure of the penis on painful structures. Vaginal distention causes maximal flexibility of the ligaments during sexual relations devoid of trauma, although sex, age, repetitive movements, race, and previous injuries can influence flexibility. When the ability of the vagina to distend is exceeded, there is pain and inflammation [7].

Women with this syndrome benefit at first from anti-inflammatory drugs and sexual rest for 20 days. Couples should then be instructed to consider clitoral handling with little or no penetration and should adopt sexual positions that avoid deep penetration.

Vaginal measurements reported in the medical literature have been obtained from the examination of cadavers [8,9], by gynecological examination using a vaginal speculum and a hysterometer to measure depth [10], or by magnetic resonance imaging (MRI) to define baseline, non-distended dimensions of the vagina of women of reproductive age [11]. These data do not take into account the flexibility of the vagina and the introduction of chemicals that change the shape of the vaginal canal [12-15]. The literature does not report measurements of the distended vagina or its flexibility, except for the study by Matthes and Zucca-Matthes [16].

The main objective of the present study was to determine vaginal flexibility in order to show that there is a limit to the elasticity and therefore to the distention of the organ, which may suffer traumatism during sexual relations, leading to a medical syndrome that causes suffering and a poor quality of life.

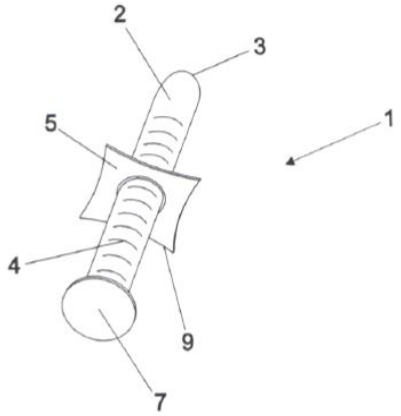

Figure 1: Perspective view of the device for measuring the vaginal canal.

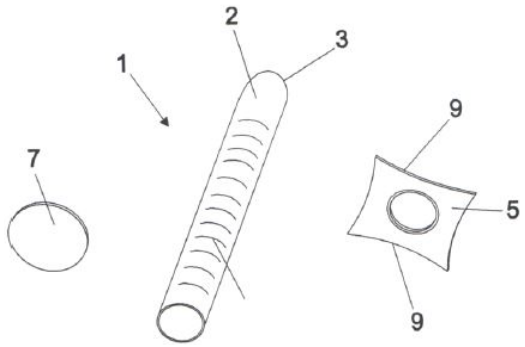

Figure 2: Perspective view of the exploded device for the measurement of the vaginal canal.

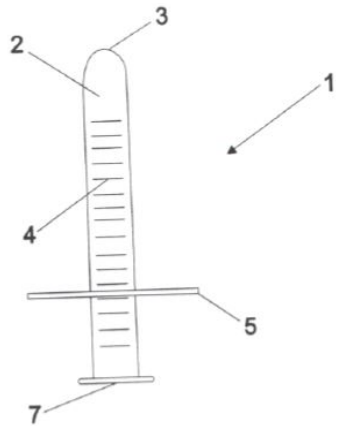

Figure 3: Side view of the device for measuring the vaginal canal, shown out of use.

Methods

The vagina was measured in women who fulfilled the inclusion criteria and who gave written informed consent to participate in the study. The size of the vagina was determined by measuring the distance from the vaginal perineal ostium to the C point of Pop-Q by speculum examination [17]. The size of the distended vagina was determined using a specific device created by one of the authors called Matthes vaginometer (MV) and by recording the measure marked on the device after maximum vaginal distention, i.e., up to the point when the patient felt discomfort. Vaginal flexibility was calculated as the difference between the measurement of the distended vagina and the value obtained by speculum examination.

The MV is a cylindrical device made of silicone or polyurethane (Figure 1) of appropriate dimensions for introduction into the vagina until reaching the lower abdomen, when an anatomical marker sliding along the cylindrical body and containing a scale indicates the length of the canal in relation to the region of the labia majora. The device is illustrated in Figures 1-5, which show various views for a better visualization.

The MV (Figures 1 and 2) is a device (1) consisting of a body (2) with a cylindrical end (3) and a curved dimensional scale (4) crossed by a marker (5) which measures the extent of the vaginal canal when the said curved end (3) touches the lower abdomen (6). The device (1) is made of silicone or polyurethane in order not to hurt the vaginal canal during introduction to measure its length. The device (1) consists of a non-solid cylindrical body (2) measuring 30 cm in length and with a circumference of 10, 12 and 14 cm in three measurements; it has a cover (7), a removable bottom delimiting the edge and the inner space (3) and a curved upper part facilitating the insertion and touch in the lower abdomen (6), and its conformation mimics the contours of the male sexual organ.

The body (2) has a cylindrical scale (4), it is ordered top down, preferably in centimeters, and is crossed (2) by an ergonomic marker (5) with sides angled to a degree compatible with the groin curvature. The marker does not cause any discomfort to the woman when the device is placed (1) towards the lower abdomen (6), with the apparent or external

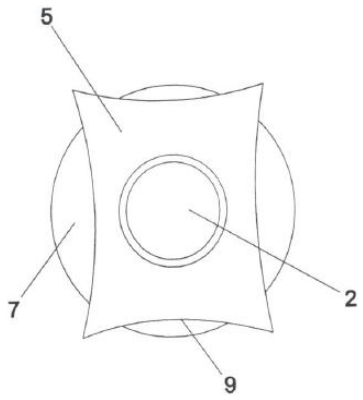

Figure 4: Top view of the device for measuring the vaginal canal.

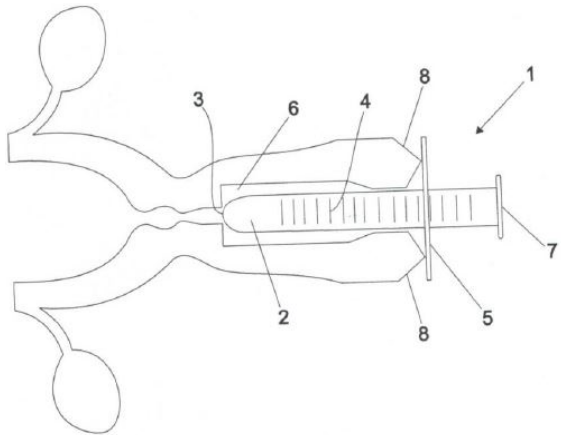

Figure 5: Schematic view of the device for measuring the vaginal canal, simulating use. In turn, the body (2) has a cylindrical scale (4) it is ordered top down, preferably in centimeters; the said body (2) is traversed by a marker (5) ergonomic with angled sides to a degree compatible with the groin curvature. The marker does not cause any discomfort to the woman when the device is placed (1) to the lower abdomen (6), wherein the apparent or external portion to the region of the *labia majora* (8) of the vagina will supply the exact length of the vagina canal, best viewed with the proper positioning of the bookmark (5) ring on the scale (4). Finally, the body (2) derives from a semi-spherical base (9), which aims to provide support to the marker (5) and slide the device itself (1) when it is not in use.

	No of cases	%
1.0	08	6.66
1.5	05	4.16
2.0	20	16.66
2.5	7.0	5.83
3.0	20	16.66
3.5	06	5.00
4.0	13	10.83
4.5	10	8.33
5.0	15	12.5
5.5	03	2.5
6.0	03	2.5
6.5	03	2.5
7.0	03	2.5
7.5	02	1.66
8.0	02	1.66
total	120	100

Table 1: Frequency distribution of vaginal flexibility.

portion in the labia majora region (8) of the vagina providing the exact length of the vaginal canal, best viewed with the proper positioning of the bookmark (5) ring on the scale (4). Finally, the body (2) has a semi-spherical base (9), which aims to provide support for the marker (5) and slide the device itself (1) when it is not in use. Figures 1-5 provide illustrative drawings for a better visualization of the MV.

Results

A questionnaire regarding parity, race, number of sex partners, time of sexual activity and frequency of sexual relations was applied to 120 women aged 18 to 50 years. A total of 104 vaginas had no prolapse and 16 had a prolapse. The flexibility of the vaginas without prolapse was about 3 ± 2.5 cm and the flexibility of the vaginas with prolapses ranged from 5.5 to 8.0 cm. The mean measure of the vagina distended by the device was 13 ± 3 cm. The longest distended vagina without prolapse measured 16 cm and the shortest 10 cm. The longest distended vagina with a prolapse measured 15.5 cm and the shortest 5.5 cm. The size of non-distended vaginas without prolapse ranged from 10 to 12 cm. The vaginas measuring less than 10 cm according to the measurement from the C point of POP-Q to the perineal vaginal ostium, i.e., vaginas with prolapse, were not included in the general mean measurement of flexibility since, even though their flexibility was more than 5 cm, their maximum distention was up to 15.5 cm (Table 1).

Discussion

Hunter et al. stated that "Frequent sexual activity can help protect women in the postmenopausal period against the development of severe vaginal symptoms, including dyspareunia, for a variety of reasons" [18]. Between these, the most important is the flexibility of the tissues that is defined as the maximum passive physiological range in a given necessary motion (joint distension, pull the ear, distension of the vagina) will depend on the muscle elasticity and joint mobility, headset or vaginal canal, without the occurrence of pathological lesions.

Some risk factors contribute to the onset of injury, including: repetitiveness, mechanical pressure, effort and strength, inappropriate posture, fractioning, static muscular work, invariability of the task, overuse of anatomical structures, lack of recovery time, shocks and impacts, vibration, coldness, and organizational factors, among others [19-20].

In the present study, the greatest variation in vaginal flexibility, 5.5 to 8.0 cm, occurred in vaginas with prolapse, without exceeding the greatest measure of distended vaginas without prolapse, which was 16 cm, with a flexibility of 2 cm. We believe that this may be a universal finding and we may infer that, for the entire female population, the vagina has a flexibility of 3 ± 2 cm with the variation of distended vaginal size without prolapse being 10 to 16 cm. Based on this assumption, we may state that complete penetration of a penis longer than 16 cm will always lead to dyspareunia. The importance of this finding is that the professionals, and women themselves, should be aware of the fact that traumatic relations should be avoided whenever possible when the penis is larger than the distended vagina.

Veale et al. published a systematic review of 17 studies showing that the erect penis measures, on average, 13.24 cm, with a variation of ± 1.89 cm [21].

A survey conducted by TargetMap indicates the mean penis size in cm and inches of men from each country. In Brazil, the mean size is 14.88 to 16.09 cm, in the US it is 11.67 to 14.87 and in the countries with the largest sizes it is 16.10 to 17.93 cm [22].

Since there is a group of women with a distended vagina measuring

10 to 13 cm and a group of men with a penis size of more than 13.24 cm, it is easy to conclude that intercourse between these groups will involve size incompatibility, with the vagina always being short and suffering traumatism during sexual relations, leading to a poor quality of life.

However, some authors overlook the property of tissue flexibility and have reported that: "In sex, the vagina can be penetrated by bigger penises because it has an elastic effect, being composed of muscle tissue that can stretch as needed. At the time of penetration, pleasure and sexual stimulation cause the muscles of the vagina to distend and "grow" in width and depth. Thanks to this elastic effect, a penis more than double the size of the vagina can fit inside a woman's body" [23]. In contrast to this statement, it can be said that during sexual intercourse, due to the disproportionate size of the penis in relation to the vagina, many women suffer a trauma similar to that of a chronic ear pull, with the consequent occurrence of chronic pelvic pain leading to RSVS.

A factor or cause that should not be overlooked in the diagnosis is the disproportionality between the extent of the vaginal canal and the length of the male sexual organ, which can cause pain to the woman and render her refractory to intercourse.

Knowing the size of the fully extended vagina, the gynecologist can guide the patient with deep dyspareunia to engage in sexual positions that prevent full penetration of the penis and can diagnose and treat women with RSVS for a better sexual quality of life. The presentation of the measuring device of the vaginal canal is intended to allow gynecologists to measure their patient's vagina.

Conclusion

There is a woman's vagina flexibility limit and a fully extended capacity beyond which the vagina suffers injury. The distended vagina measured in the women studied was 13 ± 3 cm, a value that can be extended to Brazilian women in general and which is compatible with the length of the penis of Brazilian men, i.e., 14 ± 2 cm. This finding has implications for the quality of sexual life of women because a woman who knows the size of her vagina can guide her partner to use a controlled sexual position that will not permit deep penetration of the penis.

The presentation of RSVS alerts gynaecologists to the need to assess the length of the vagina of their patients, especially those with dyspareunia and chronic pelvic pain, in order to counsel them for a non-traumatic intercourse, avoiding and solving pelvic pain resulting from this disparity and ultimately providing improved sexual experience and a better quality of life. The presentation of the measuring device of the vaginal canal is intended to allow gynecologists to measure their patients' vagina and also to permit women to make their own measurement.

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