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STERILITY IN WOMEN; SOME OF THE CAUSES; MINUTE LESIONS ONE OF THEM; SUGGESTIONS AS TO TREATMENT; PLASTIC SURGERY ON OVARIES AND TUBES FOR THEIR PRESERVATION.

BY

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Two things especially influenced me to select this subject for my talk with you this evening. One was the reading of an editorial in the New York Medical Journal of February 25, 1899, and the other was a report from one of my patients on whom I operated a short time before. The editorial was headed: "The Disquieting Frequency of Criminal Abortions." Report from my patient was a pæan of joy and thanksgiving at the prospect of soon becoming a mother after seven years of infecundity,—the change being the result of my operation; and it occurred to me that it might be profitable to bring the subject before you, because I believe it is one which has not received the attention which it merits.

Criminal abortion among the married is very prevalent undoubtedly, but I cannot believe as some do that it is alarmingly on the increase. I would rather choose to believe that the intelligent woman of the day has an increasingly high regard for maternity and also a clearer understanding of the gravity of the interference with physical laws involved in the criminal induction of abortions. At any rate in my own practice there is, in fact, a steadily increasing percentage of patients who come for advice because of disappointment in their hopes for offspring, and those who come "to have the period brought on," fearing pregnancy, are not nearly as numerous as they used to be, nor should I like to believe that this is only

because word has been passed among those who know me that there is no use in asking me to do that job.

Let me briefly name the chief points in anatomy and physiology of the organs of procreation as far as concerns our subject. The hymen, vagina, with normal secretions and cervical attachments; uterus, of normal structure and location, its canal and cavity lined with normal membrane furnishing normal secretion; fallopian tube, of normal structure as to length, calibre, fimbriæ, attachment and lining; ovary, normal location, and containing normal follicles and ova.

It would be far beyond the scope of my paper to present to you all the pathological conditions which the different parts of the sexual organism are capable of assuming. You must bear in mind that failure of conception may mean the non-fulfillment of only one of the numerous functions of this elaborate sexual system.

Various theories have been advanced as to the successive steps of the journey of the spermatozoa of the male from without and of the ova from within. I am convinced that it is the inherent faculty in the spermatozoa, their vibrative motion, which propels them along, and that they are not in any wise drawn into the uterus *en masse* in the seminal fluid through any sort of muscular movements of that organ, constituting what has been termed the suction theory,

Among other things there are two facts which especially go to establish the individual locomotion theory. One is, that the lodgment of seminal fluid upon the vulva has again and again proved to be sufficient for impregnation, and this in cases where there was absolutely no sexual enjoyment, much less experience of orgasms, which are synchronous with the uterine movements in the suction theory. Another fact is that the commonest means resorted to for the prevention of conception, namely vaginal douches, are generally effective when resorted to immediately after coitus. Those who claim to have been "caught" in spite of such douches, frequently containing mercuric bi-chloride, have often admitted that possibly it may have happened just that one time "when I didn't get up for half an hour or so." As regards the other fact mentioned, I have heretofore reported a case of conception in a young girl in whom there was in place of the hymen, a thick septum having a minute opening admitting only a fine probe, which opening was found only after a careful search. The young lady was engaged to be married and being irregular in her menses, was brought to me. Finding the almost absolutely imperforate septum I urged the preparing her for her

near approaching marriage by dividing it,—which I did by a crucial incision. A Sims' glass dilator was placed and changed the second evening for one a little larger. In the night she aborted a two and one-half months' fetus. This happened in this hospital.

I believe that the theory of tubal impregnation with subsequent expulsion of the impregnated ovum into the uterine cavity has become pretty generally accepted. I cannot say that I am ready yet to regard it as established; still it has no very special bearing upon our present subject.

We come now to the more interesting consideration,—"How does the ovum get into the tube?" Here again various theories are advanced. According to some, the ovum is simply dropped into the abdominal cavity and there "picked up by the fimbriæ." This seems altogether a theory of chance.

Others believe that there exists a peculiar current of some sort in which the ovum, dropped from the ovary, is carried to the pavilion of the tube. I am unable to embrace either theory. No, there is a much more consistent one which satisfies me, so much the more so, since I have had occular demonstration of what I consider the true function of the tubal pavilion and fimbriæ. Early in my operative work I often marveled at the exquisite structure of this delicate organ, so easily affected by inflammatory processes and so easily torn in being dug out of exudates, especially the ampulla and the fimbriæ. Classic literature speaks of their marked resemblance to the sea-anëmone, and knowing how the latter "seizes and secures its food by the aid of its tentacles," I wondered whether the tubal fimbriæ did not do the same thing, "seize and secure." It happened some years ago that I operated upon a young woman immediately after her menses. After opening her abdomen I lifted out of the wound an ovary, with a tubal pavilion and its long fimbriæ like a hand attached to it. I remarked to the class: "Here we have an ovary almost covered by the fimbriated extremity of the tube, apparently firmly attached to it by inflammatory adhesions."

As I said this I proceeded to gently separate the tube and was surprised to see the whole "hand" (as I have called it) let go of the ovary, as if shrinking from my touch, and in the centre of the space just covered by it, there was a ruptured follicle. It could have been nothing else.

One of the longest fimbriæ you know is generally attached close under the ovary, and it is most likely through this "Fimbria ovaria"

that the impulse to "seize and secure" is conveyed to the mechanism of the tube, perhaps directly from the ovary.

When a patient comes for advice concerning infecundity I make it my business at once to seek an interview with the husband.

The following causes may be chargeable to the husband: 1. Absolute barrenness from various causes. 2. Impotence. 3. Gonorrhœal infection of the wife.

We have all seen much of the last named, and I have also met with the others.

Of cases of barrenness I have encountered four, and have suspected several more whom I could not examine.

In regard to impotence I may say that although, as before stated, impregnation may often follow the lodgment of seminal fluid upon the vulva, yet many cases of attempted or incomplete coitus do not result in conception because of the annihilation of the sperma in the acid secretion of the lower vagina.

Gonorrhœal infection. The husband will often when interviewed, at once give vent to his deprecation of his wife's "good-for-nothingness." In answer to questions about disease before marriage he will perhaps say something like this: "Oh, no more than most fellows have, one time or another." And what is that? "Gonorrhœa." But then again many do really suffer keenly when assured that the condition of their innocent wives is really due to infection from them.

It was my privilege to work under Dr. Noeggerath, who first brought the profession's attention to "latent gonorrhœa," so that already at the time when many if not most of his colleagues were still treating his ideas with but scant favor, and even disdain, I received his theories, first hand, with ample demonstrations of their correctness. The profession no longer laugh at Noeggerath.

So much for the husband; there is but very little he can be made to do to bring about a cure of the innocent wife.

The following table suggests what you are to bear in mind as possible causes of sterility in woman. I found the list in a work by Kisch. He classifies the causes under two heads: 1. Sterility due to inability to the formation of "Keim," as he calls it, that is, the physiological fluid constituents of the ovary-lymph. 2. Sterility due to obstacles to the contact of normal sperm and ovule. Under the first he classifies as follows:

A. *Absolute, non-changeable.*—Complete defect of ovaries: Congenital atrophy of ovaries; Atrophy through infectious diseases, through

constitutional diseases and toxic influences; New growths of ovaries involving all the ovarian follicles; Senile changes in ovaries; Castration.

B. *Relative, temporary.*—Insufficient development of ovaries; Inadequate "Keim" through too early marriage (amenorrhoea); Ovarian tumors and castrations in which a portion of normal tissues has been left intact; Chronic oophoritis and syphilitic affections of the ovaries; Excessive adipose development; Anemia; Chlorosis; Scrofula; Morphinism; Alcoholism; Various influences affecting nutrition and innervation, such as change of abode, or methods of living, peculiarities of temperament and hereditary tendencies.

Second.—Sterility through failure of contact.

A. Concerning the wife:

Absolute.—Congenital or acquired complete thickening of the tunica albuginea, preventing the rupture of the follicle; Absence or faulty development of tubes; Absence or rudimentary development of uterus; Congenital atresia with retarded development of uterus; Absence of vagina; Excessive narrowness of pelvis, rendering the vagina inaccessible; Hermaphroditism.

Relative.—Partial and curable thickening of the tunica of the ovaries; Inflammatory products from perioophoritis; Disease of the cervical glands; Dislocations and adhesions of the tubes. Narrowing and adhesions of the ostia; Inflammation of the tubes; Pyosalpinx; Obliteration of the lumen of the tube; Retro-uterine hermatocele; New formations in uterine cavity; Primary atrophy of uterus; Puerperal atrophy of uterus; Malpositions and formations of uterus; Hypertrophy, atrophy and other changes in cervix; Eversion and erosions; Cervical catarrh, especially gonorrhœal; Spasmodic dysmenorrhœa; Atresia of vagina,—obliteration through cicatrices and growths; Abnormal vaginal ostia and fistula; Tumors of labia and vulva; Absence of external genitals and partial absence of vagina without defect of the inner genitalia; Abnormities of hymen; Pathological condition of secretions; Vaginismus; Dyspareunia; Perverted sexual life.

B. Concerning the husband:

Absolute.—Diseases of the central nervous system, and certain constitutional diseases; Congenital or acquired absence of both testicles; Atrophy of testicles; Absence of spermatozoa, or of spermatic fluid, or both; Senile impotence.

Relative.—Faulty development and acquired deformities of the penis: Stricture of the urethra; Insufficient spermatic fluid; Nervous

impotence; Gonorrhœal and syphilitic infection; Preventive cohabitation (facultative sterilty).

Gross lesions are very often found in cases of sterility. You have seen many of them here at the school, at the clinic, and in the operating room. But this fact does not necessarily condemn a patient to gloomy childlessness in the future. Plastic conservative surgery has been gaining foothold. Fifteen or twenty years ago you could hardly go to a meeting of a gynecological society without being served, to gratify your hunger for knowledge, figuratively and literally speaking, with ovaries and tubes on soup plates,—the more the merrier. Perhaps in more than one place in this broad land there might be written a new version of "The Deserted Village" as a sequel to some of those meetings. But thank God, there were present plodders also who were content to sit on the back seats and listen, who were not caught by that disastrous current which swept all countries in which poor women were willing to furnish these meetings with specimens. A marked change has taken place. The removal of tubes and ovaries is a very simple procedure and may often be so easy that an expert could do it blindfolded, but the preservation of these valuable organs, in digging them out of inflammatory masses and their restoration to a high or fair degree of functional activity often constitute a difficult and delicate operations as are encountered in the realm of surgery.

But, gentlemen, it pays. Among those who long ago realized this, and whom I see present, was Dr. A. P. Dudley, who I know will have something to say on this subject this evening. I know he will gladly procure for you his monographs on this subject. Dr. Hanks also never went into the wholesale ovary trade.

It is generally supposed that a tube or an ovary, because it contains pus, must forthwith be removed, but a conservative surgeon will better instruct you. In undertaking work where pus is feared or expected, the genital tract must be well prepared previous to operation. A tube may then be treated fearlessly, washed out by the use of peroxide for example, and opened up, mended, and shaped to conform to normal conditions. So with the ovary.

I will not dwell upon the gross lesions. The aim of the surgeon should be to preserve all the healthy tissues he can and place or fix the restored organs as nearly as possible in their normal relation with the other organs.

It does not take a large piece of an ovary to furnish a large number of follicles and ova, nor do we need to leave behind but a

small portion in order to maintain in the patient all the attributes which are under the control of that organ. In Dr. Dudley's article, if you get hold of it, you will see a sketch of a mended ovary and tube, and in this connection I will say that when a good portion of the tube necessarily has been amputated, the tube loses its power to "seize and secure." The chance theqry may then safely be applied to it. It lies there with open mouth as large as we can make it, ready to catch any stray ovum; yet conception does follow in a fair number of cases.

A certain number of infecund women exhibiting no discernable pelvic lesion may recover their power of fecundation after general hygienic treatment. Yet in a large percentage of such cases treatment is of no avail.

Here is a class with which I am becoming better and better acquainted. I suggest an exploration through laparotomy, and my suggestion is usually followed. "Now, why operate if there is no lesion?" There may be only a very slight lesion or apparently none to be detected by examination; but this is usually my answer to the patient: "I do not urge an operation, you are apparently a perfectly healthy woman, yet you have now waited in vain so many years. My experience has taught me that infecundity is often caused by lesions so slight that they are not detected until an exploration is made. The operation is practically without any danger whatever in my hands and you may take the risk without fear." In such cases, if a lesion is found it almost invariably proves to be obstruction of the lumen of the outer extremity of the tube, or else the latter is being locked by adhesions in a position forbidding its embrace of the ovary.

You perceive that I have not gone into details of treatment, but this would have lengthened my paper beyond the established limit. We will take that up at our clinics, and you will consult your text-books for guidance in dealing with cases as they appear in your practice. My paper then, I present to you only as a general survey of the subject.

DISCUSSION.

PROF. A. BROTHERS said that the subject was one which afforded ample opportunity for careful study and deep thought. It was a well-worn subject; and many cases of sterility came to the general practitioner. He had looked over notes of 134 cases of sterility in the time at his disposal, and although all of these women had not consulted him for that particular condition, sterility had been a prominent feature. Of this number, there were 80 cases of primary

sterility and 44 of secondary sterility. By this was meant that in the secondary cases the woman had borne children, but had ceased to do so. In his series there had been at least 24 in which the sterility could be fairly attributed to the male. Two of these men had been suffering from gonorrhoea. In 9 the semen showed no spermatozoa; in 4 there were very few spermatozoa and these possessed but feeble vitality. In examining semen he always insisted that the semen should have been secured within two hours of the time of examination. In two other cases the act of copulation had been imperfect. In seven of the cases the spermatozoa had been normal. There were 66 cases in which the female seemed to have been responsible for the sterility. His first attempt in considering treatment was to locate the source of the sterility in the uterus or in the adnexa. Of the primary cases the source of the sterility had been in the uterus in 27, and in the adnexa in 28 cases. Of the cases of secondary sterility, the source had been in the uterus in 26, and in the adnexa in 25. Some of the women had been operated upon, and that too in spite of the fact that an examination of the male showed that he was responsible. The surgeon who had subjected these women to such wanton operative interference ought certainly to blush because of his negligence in not examining the male. Of the 134 cases, 26 had been subjected to some operation, either by himself or by others. Only two of these women had become pregnant. Many women who complained of sterility could be successfully relieved by the insertion of a sound or the introduction of a pessary, yet there were many cases which seemed incurable in spite of all our modern knowledge. If we could discover and remedy the minute changes responsible for the sterility, we would be nearer curing these obstinate cases.

Dr. Brodhead regretted that he had been unable to be present at the reading of the paper, but said that it seemed unjust and unfortunate that some women should have very large families in spite of their efforts to prevent conception while others who were willing and anxious to be mothers could not become pregnant, although given every aid within the reach of scientific physicians. When one considered the size of the canal in the fallopian tube, it was not hard to understand how sterility might easily result from a slight flexion, adhesion or exudate at any point. For this reason, it seemed reasonable to believe, as the reader of the paper had said, that coeliotomy might often reveal slight abnormalities and afford an opportunity for their correction.

PROFESSOR A. PALMER DUDLEY said that the reader of the paper had emphasized the fact that the male was not infrequently responsible, and in such cases it was obviously wrong to refer to it as "sterility in *women*." Any wide-awake physician who was consulted by a woman because of sterility would first of all examine the husband, for he certainly would not wish to subject the woman to needless treatment. The cause of sterility in the woman was to be found in any condition which obstructed the passage of the spermatozoa to the ovum. Every part of the genital tract from the cervix uteri to the fimbriated extremity of the tubes, and even to the ovaries should be examined; then the circulation in these organs should be considered, and then the character of the secretions of the uterus and vagina. In the healthy state, there was a clear, limpid, colorless fluid secreted from the uterus, but in unhealthy conditions it was changed into a muco-purulent or sanguinolent secretion in which the spermatozoa could not move or live. If the uterus were in an abnormal position its circulation would become obstructed, and the chances of the impregnated ovum remaining in the uterus for the full term were slim. If all these conditions could be eliminated, and still the source of the sterility remain undiscovered, the tubes and ovaries must receive the attention of the physician. A diseased endometrium was a very common cause of sterility, as were also many intraperitoneal conditions. But beyond all these there were certain minute lesions within the pelvis that might give rise to sterility. Any form of twist along the course of the fallopian tube, and adhesions across it, a cyst at the mouth of the tube, closure of the fimbriæ by slight inflammation, adhesions of the fimbriæ to the ovary or broad ligament or to the intestine, a dip of the tube so that the ovum was not grasped as it was discharged from the ovary,—any one of these conditions might cause sterilty. Any condition of the ovary which would prevent the normal development or escape of the ovum from the ovary to the tube would cause sterility. Cirrhosis of the ovary, the result of long congestion; any covering of lymph which would prevent the escape of the ovum; any condition causing dropsy of the sac of the ovum would give rise to sterility.

The treatment of the condition would depend entirely upon the diagnostic ability of the attending physician. Certainly a laparotomy would not be appropriate in a case in which the sterility was solely dependent upon a slight uterine displacement. The indications for treatment were to remove every pathological condition, aside from

gonorrheal inflammations, which required special and radical treatment—to get the secretions and the uterus into normal condition and to correct uterine displacements before proceeding to more radical surgical measures. He was very happy to be able to speak this evening upon his special field of work—conservative surgery on the ovaries and tubes. He believed the time would come when it would be a professional misdemeanor for a surgeon to ablate a woman's ovary when it was possible to save any portion of them for her. This was strong language, but surgery, from before the time of Christ, had not been sacrilegious, but had had for its object the preservation of the human. The man who would remove both testicles from a male in order to reduce prostatic hypertrophy was a good one to avoid, and for all members of the medical profession to condemn. Such an operation sacrificed two organs to save another which might be easily and safely removed without such sacrifice. To-day the government of France was, to his personal knowledge, offering a bounty to women to bear children, because the death-rate in that country was greater than the birth-rate. He believed we were advancing along the right line, that of conservative surgery. We had learned that the ovary could be resected and transplanted, and that even a small portion would preserve the normal function of the ovary. This preservation was in itself exceedingly important, if only to spare the woman the hot flashes and nervous symptoms which were associated with the establishment of the artificial menopause. It was possible now to wash out diseased tubes and resect them, and although the fimbriæ might be absent the lining of the tube, like that of the uterus, still possessed its lining of ciliated epithelium, and these cilia helped the passage of the ovum. The results of such conservative work in his own hands had been twenty women known to have become pregnant, or about one in six, and this probably did not represent the whole number, for some of the cases had passed from under his observation.

Dr. S. E. Cahill said that Professor Waldo had stated, that in about 70 of his cases abortion had played an important part, and the reader of the paper had made the statement that his attention had been called to this subject at this time by an editorial on abortion. The surgical aspect of this most important question had been most intelligently discussed. The physicians in his section of the country, he felt sure, were very derelict in not educating the women to the belief that the family physician should be *the* friend of the

family. The women in his section of the country actually believed that in some mysterious way the product of conception did not take on life until about five months pregnant, and these women actually believed that the induction of an abortion before this time was no crime. Bowditch and Gooddell had raised their voices against this; but physicians, as a class, were very negligent of their great duty, and of their vast opportunity for good in the way of educating the families whom they attended. His attention had been very recently and painfully called to this subject by a woman who was now exceedingly desirous to become a mother, and who, in all probability, would not have her wish gratified because of her own efforts in years past to induce abortion. In this town there was a row of elegant buildings, conducted as an abortion institution by a man who had the audacity to issue a pamphlet descriptive of his business. He believed our duty as physicians was not discharged when we treated a woman who was sterile, and placed her in a position to become a mother; our duty was only completed when we educated women to the belief that abortion was a crime—a murder—and that those who practiced it would later on, in all probability, be unable to have their desire for motherhood gratified.

PROF. H. T. HANKS said that the paper was deeply interesting in both its scientific and moral aspect. Only that very day he had been asked to produce an abortion on a young woman whom he had known from infancy. And not many weeks ago he had delivered a woman of a child, the father of which was the woman's brother. She too desired me to induce an abortion. These things were almost too dreadful to think of; but we must face these facts, and our grave duty lies in the way of educating our patrons, so that they will not resort to an abortion.

The treatment of sterility had been most ably presented by the speakers of the evening, the important points being the examination of the husband and the systematic examination and treatment of the wife, if the cause of the sterility were in her. The spermatozoa did not die within an hour or two, and could be easily carried a long distance in a bottle if kept secure in the pocket. Everything else should be done before resorting to laparotomy, and this should never be done by an inexperienced operator.

It was an especially unsafe thing to attempt in a small town. He felt that he had cured many cases of sterility in recent years, which formerly he would have subjected to laparotomy. A simple method of curing a uterine catarrh, and ofter curing sterility, was

the introduction of a sterilized negative electrode, and the passage of a current of electricity from the positive electrode inwards through the endometrium, the positive electrode on the abdomen. A few treatments of this kind would cure the catarrh, and this, in itself, would often effectually and safely relieve the sterility.

PROF. NILSEN, in closing the discussion, said that one of the causes of sterility was careless operations. He thought he had done his share to educate his female patients on the points touched upon by one of the speakers.