FORMATION OF AN ARTIFICIAL VAGINA BY INTESTINAL TRANSPLANTATION.[1]

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(With two illustrations.)

IN the *Annals of Surgery*, September, 1904, I described a method which I had devised for the formation of an artificial vagina in cases of congenital or acquired absence of that organ. The case which then I had on hand was that of a young married woman who, as the result of sloughing in connection with her first confinement, had suffered complete destruction of the entire vaginal canal. She refused to have the operation which I suggested performed and passed from observation; but as the method which I had worked out was new, and seemed to me entirely feasible, I published it as mentioned.

Many surgeons have tried to construct a new vagina under conditions such as I have suggested, but all of them have attempted to make it by lining the canal which they had made between the bladder and rectum with flaps of skin taken from the inside of the thighs, or from the neighborhood of the vulva. In

[1]Read at the twentieth annual meeting of the American Association of Obstetricians and Gynecologists, held at Detroit, September 17-19, 1907.

all the cases which have been reported there has been practically complete failure, owing to the contraction of the artificial canal. I need not go into a discussion of these methods, which are familiar to all.

The method which I suggested was designed to utilize for the lining of the new vagina the sigmoid flexure of the colon, or a loop from the lower end of the ileum. The abdomen was to be opened and the sigmoid, or loop of ileum, seized near its center by forceps introduced from below through the new canal and drawn down to the perineum. The piece of bowel thus drawn down was next to be detached, with the usual precautions, by a transverse incision through the gut, but without injuring the vessels in the mesentery, the continuity of the bowel being at once restored by anastomosis. One end of the detached loop would then be inverted and closed by a continuous suture, not penetrating the mucous membrane. By pulling up the fundus of the uterus until the cervix was exposed in Douglas's cul-de-sac (or, if the cervix were absent, the opening into the uterus found), the other end of the bowel would be attached around the cervix by interrupted sutures, so as to form a canal for the uterine discharges. The abdomen would then be closed in the usual way, with, if desirable, a drainage wick introduced from above downward through the new canal and just below the loop of intestine. Finally, the patient being placed in the lithotomy position, the loop of bowel still held by forceps would be opened, the bowel cleansed as necessary, each limb of the loop packed with iodoform gauze, and the edges of the opening in the bowel attached to the surrounding skin.

At the completion of the operation a double vagina would be formed, each canal being approximately of the size of the bowel selected, and with the nutrition positively provided for by the integrity of the mesentery. The gauze would be removed and replaced from time to time as necessary, and at the end of ten days or two weeks the septum between the vaginas could be easily removed by clamp pressure. Such a vagina would be of ample size, would be lined with normal mucous membrane, would not materially contract, and would serve every purpose save that of childbirth, and it would hardly be prudent, perhaps, to absolutely deny the possibility of a birth through such a canal, considering the ample capacity of the colon under certain circumstances.

With this proposed operation in mind, I took pains in a large

number of abdominal sections, to note the available amount of slack which could be found in the mesocolon of the sigmoid and the mesentery of the ileum. I always found that the slack was ample for the purpose suggested, and in one instance I was able to carry out this procedure on the body of an adult male a few moments after his death, and while the parts were still in practically a living condition. In this instance I found in both the colon and the ileum amply slack to be used for the purpose named.

I carried out this procedure March 22, 1907, in all its details on a patient aged 38, who some eight months before had been delivered by forceps of her first child. Following the delivery there had been complete sloughing of all the vaginal tissues. All that was left was a sinus so small and so tortuous that it could not be followed by the finest probe. The patient was menstru-

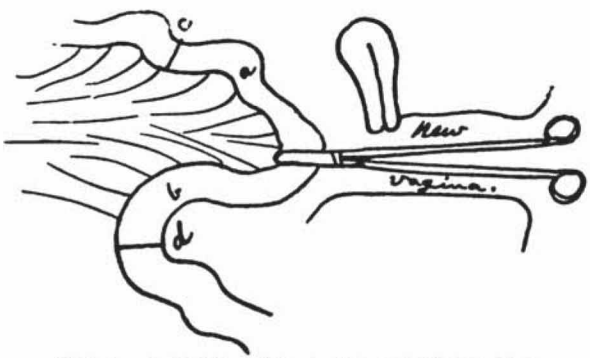

Fig. 1. *a, b*, Sigmoid; *c, d*, points for section.

ating with fair regularity, but the function was performed with great pain owing to the difficulty of extruding the blood through this tortuous canal. She was in fairly good flesh, so that any abdominal operation would be attended with more than the average technical difficulties.

The operation was made in the presence of Dr. M. Jones of Oakhill and Dr. Wardlow of Columbus. In making the new vagina the parts were separated with a good deal of difficulty owing to the amount of cicatricial tissue present, and the rectum was accidentally wounded. The wound was closed at once with fine catgut, and gave no further trouble in the progress of the case. The details of the operation were carried out, as had been previously planned. On opening the abdomen some pelvic adhesions were found, which had to be separated. The uterus was

found in a normal condition, but a double hematosalpinx was present. On the left side the ovary was somewhat enlarged and intimately connected with the corresponding tube. This ovary, therefore, and both tubes were removed. The cul-de-sac was then opened, but absolutely no portion of the vagina was present. The artificial passage which had previously been made was therefore enlarged and extended freely. A loop of small intestine (the lower end of the ileum, as this seemed to have the greater freedom of motion) was then seized with forceps, introduced through the vagina, and having been detached from the rest of the bowel was drawn down into the new canal, the continuity of the intestine being restored by means of a Murphy button. As the uterus was rather fixed in position so that it would be quite difficult to attach the cervix to the bowel in making the new vagina, and as the uterus would have no function further than the carrying on of

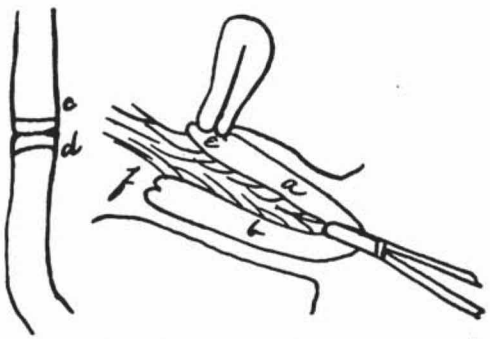

Fig. 2. *a, b,* Sigmoid drawn into new vagina; *c, d,* anastomosis; *e,* attachment of one end to cervix; *f,* closed end.

menstruation, it was removed in the usual way, leaving the right ovary. The peritoneum was drawn over the floor of the pelvis so as to leave this intact.

Healing of the abdominal incision took place by first intention, and the tissues in the perineum united with equal promptness, except at the point where a drainage wick had been passed from above down. This healed as soon as the drainage wick was removed. The entire series of operations required two hours, but in a patient with thinner abdominal walls, and with the experience gained from this case, the time could be very materially reduced.

May 1 the septum between the two vaginas was cut with

scissors, light packing introduced, and the patient returned to her home May 4 in excellent condition. The Murphy button passed on the tenth day after her operation. August 18 the patient consulted me and was feeling perfectly well. All her pelvic symptoms had subsided, and her only complaint was that occasionally her bowels were a little loose and that there was at times a little difficulty in holding her urine. This difficulty she had had before her operation, so that the operation itself was not in any way responsible for it. Her power of retention was increasing, and will doubtless ultimately be entirely recovered. Vaginal examination showed everything in fine shape. At the extreme upper end of the vagina I could make out a septum, the remains of the original septum formed by the two intestinal walls. The new vagina seemed to be absolutely normal in every way, so that I think no one in making a vaginal examination would have suspected any abnormality. The vagina was capacious in every particular, and showed no evidence of any cicatricial contraction.

With this lapse of time, therefore, since the operation, and with the excellent local conditions which are present, I believe the operation in this instance may be accepted as having been entirely successful. The operation is not one which should be undertaken by a tyro in abdominal surgery, since the operator should understand thoroughly what the different steps of the operation are, and how to carry out promptly and accurately the proper technique. The experienced surgeon, however, should have no special difficulty in carrying it out in all its details, and with no more risk than that attending any other abdominal operation of average difficulty.

DISCUSSION.

DR. JOSEPH PRICE of Philadelphia said that the method described was an ingenious one for such an affliction. However, all surgeons had had experiences along that line. For instance, surgeons were commonly asked to repair some horrible traumatic lesion, such as one received by a patient falling astride an iron fence, splitting the rectovaginal septum, and occasionally one would find a little girl, perhaps, with these parts nothing more than a cloaca. He cited such a case, which had come under his observation recently, and on which he had operated.