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## ON A MODIFICATION OF THE "INVAGINATION" METHOD OF OPERATING FOR THE RADICAL CURE OF HERNIA.

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I THINK it can hardly be necessary to enter into any argument as to the desirableness of effecting the radical cure of hernia in every case where it is possible. My own experience is that there is great difficulty in getting trusses properly fitted, as well as in having them properly applied by the patients. Yet a truss badly made or wrongly put on may be worse than useless; it may cause suffering, and even danger to life.

A radical cure can be accomplished in only one way: by doing away with the sac as such; by obliterating the tube of peritoneum, like a glove-finger, through which the descent of bowel or of omentum takes place. This is the object aimed at in all the proposed procedures, which are very many. Sédillot, in the edition of his *Médecine Opératoire* published in 1855, enumerated twenty-five, and his list was not then complete. The number has been very largely increased since that time, and especially, of course, since by the introduction and general adoption of antiseptic methods, the dangers of such interference have been in great measure set aside. Modern surgeons have suggested and put in practice much bolder modes of dealing with the problem than could formerly have been employed. By some, as Banks and McBurney, the sac is ligated and cut off as high up as possible. Barker cuts it off at the external ring and carries the stump up to be sutured into the internal ring. Ball twists it up and applies an intercolumnar suture. McEwen and Bishop crumple it up by means of "drawing-string" sutures. Bassini's and Halsted's plans are to make a new canal and a new ring; Landerer makes a plastic operation, transplanting one of the columns of the external ring. Kocher carries the sac away from its position, angulating it twice, bringing it out through an artificial opening in the tendon of the external oblique muscle, and then twisting it.

I do not propose to discuss these various methods, but venture to suggest another plan by which the hernial canal can be closed, I believe securely and permanently, and the object accomplished in a simple way.

I think it may be laid down as a sound rule of surgery, that in all operations there should be as little sacrifice and as little



disturbance of the parts as possible, consistently with the attainment of the desired end.

A recent writer says that there are two requisites for an operation for the radical cure of hernia. "1. Complete elimination of the peritoneal funnel, of which no trace must be left in the canal. 2. The firmest union of the rent in the fibrous layers of the abdominal wall that can be obtained." He then states that "a proper operation requires the hernial canal to be laid open throughout its whole length up to the level of the internal ring, and the neck of the sac and the peritoneum beyond the internal ring to be completely loosened and dissected free for some distance beyond. Thereafter the walls of the canal must be accurately sutured and brought in the closest possible apposition." In other words, he would first lay open the abdominal wall, and then close the rent as firmly as possible. But would it not be better to avoid making the rent unless it is absolutely necessary to do so?

I think we can do away with the sac as such without any destruction of its tissues, not eliminating it or laying it open, but simply making use of it, converting part of it into a solid plug, and fastening it into the canal at its inner end, sacrificing nothing. Such invagination of the isolated sac is the essential principle of the procedure which I wish now to describe.

It will be remembered that there were in vogue many years ago a number of invagination methods. Of these perhaps the best known was that devised by Gerdy, but modified by Wützer, and generally attributed to him. All these methods consisted in pushing up the sac along with a considerable amount of the surrounding tissue; and my belief is that to the want of isolation of the sac, and the consequent drag upon it, many failures in cases at first promising should be attributed.

Some successes were, however, attained. I operated in 1863, by a method substantially that of Wützer, upon a young man who was desirous of entering the U. S. Navy, but was prevented by the fact that he had a right inguino-scrotal hernia. He afterward gained his appointment, and three years later was doing duty as a third assistant engineer, the rupture giving him no trouble. Two other cases, on which I operated in the same way at about the same time, passed out of my observation before the results could be determined. And the risks and uncertainties of all such procedures were then so great that it seemed imprudent to undertake them unless in exceptional instances.

I have already said that the method which I wish now to describe consists essentially in the invagination of the isolated sac. No one feature of it, I believe, is entirely new; but as a whole it has not to my knowledge been proposed by anyone else.

I expose the hernia by a curved incision, describing a semi-circular flap of ample size. (See Fig. 1.) This I do also in operat-

ing for strangulated hernia, as it carries the cicatrix away from the seat of trouble, which is afterward covered in by sound skin. (I have several times noticed, however, that in the final healing the scar is drawn over so as to form a straight line between its two extremities.)

FIG. 1.

FIG. 2.

FIG. 3.



The sac being laid bare, is isolated from the external ring down to its tip. Sometimes it is better to empty it during this process, which may often be accomplished by tearing with the fingers. Bassini's advice, to begin the isolation at the ring and to proceed downward, is, I think, generally to be followed.

In order to secure control of the empty sac I now pass a silk thread through its wall at either side; the two ends of each are left long, and caught in hæmostatic forceps.

With the forefinger of the left hand the tip of the sac is now inverted and pushed up as far as the internal ring, or as near it as possible. (See Fig. 2.)

Next a slightly curved needle, with an eye near the point, and armed with a thoroughly sterilized silk thread, is passed up along the finger as a guide, to be pushed out at one side of the tip through the tendon of the external oblique muscle. One end of the thread being caught, the needle is withdrawn slightly, and again pushed through the tendon at the other side of the tip. The other end of the silk thread is now detached from the needle, which is wholly withdrawn, and the two ends, left slack, are caught together in a hæmostatic forceps.

Now, by means of the two lateral threads, and by grasping in the fingers, the doubled sac is drawn down carefully, and with a small curved needle a fine silk suture is passed through it from side to side from below upward as far as possible, and then from above downward, so that its two ends, when drawn tight, will crumple up the sac into a solid mass. (See Fig. 3.) These ends are tied and cut off short.

The lateral threads are now removed, and the other silk thread

is drawn up tight, pulling the plug formed of the sac into place at the internal ring; its two ends are tied on the outer surface of the tendon of the external oblique, and cut off short. The skin-flap is laid over in place again, the wound closed by sutures, and the ordinary antiseptic dressings applied.

Until the wound is completely healed the patient is kept in bed. I have not put a truss on any of the patients recently subjected to this operation, but have cautioned them against making any muscular effort likely to bring undue stress upon the parts until time enough has elapsed for their consolidation.

As to the ultimate results of this operation I have no cases of sufficient duration to enable me to speak positively. A man, aged twenty-two years, operated on October 24th, is present for your examination this evening; he does full work as an orderly at the Pennsylvania Hospital without either truss or discomfort. To my disappointment, a boy, aged twelve years, operated on December 12th, has failed to be here; there is no sign of yielding of the plug, though he is running about as heedlessly as any boy of his age. A man, aged forty-nine years, operated on at the same time, seems also to be completely relieved. On January 10th I operated on a man aged fifty-four years, at St. Joseph's Hospital; he has since had a severe bronchitis, but his hernia seems entirely controlled, and he is now going about freely. Another man, aged thirty-two years, in the Pennsylvania Hospital, operated on January 7th, is still under treatment.

Of four other cases, including the first one, operated on in September, 1890, I will not speak, as they passed completely out of my knowledge too early for the results to be determined.

I am well aware that my array of cases is very small, but the first two above mentioned and the fourth afforded pretty severe tests of the efficiency of the closure of the canal. I offer the method as one which seems to me sound in principle and promising well; moreover, in case of its failure, the parts are in condition for the repetition of this procedure or for the adoption of any other that may commend itself.

Of course, there must be an exercise of judgment as to the suitability of any mode of operation in any given case. I think there would be difficulty in adopting the one now described in cases of congenital hernia; and whenever for any reason the sac must be extensively opened it would have to be carefully sutured before invaginating it. And I believe that it might not answer well if the canal and internal ring were very wide.



