

VESICO-VAGINAL FISTULA; WITH A DESCRIPTION OF A NEW METHOD OF OPERATION.

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THAT operations for the cure of vesico-vaginal fistula are even now sometimes futile will, I believe, be admitted. Even in the latest list of any importance—that of Milton of Cairo—out of 79 operations 41 were useless. Patients were cured after one operation in 21 instances, after two in 10 cases, after three attempts in 6 cases, whilst 1 case required four operations to effect a cure. In 12 cases no benefit at all was obtained. The lesion is one which is situated in an awkward position for operative work, and one surface at least of the tissue involved is constantly bathed by a fluid which, when it is no longer confined to its own territory, can become very acrid and damaging. Any union which depends for its success upon primary adhesion, if exposed to the action of this fluid, will be extremely likely to break down and allow percolation through into the track of the sutures, and consequent failure. It is necessary, also, with a view to future comfort, that the re-formed bladder should be lined entirely with mucous membrane, any raw surface left being a constant menace, as forming a nidus for the deposition of calculous material. Nothing can be more discouraging to the patient or more exasperating to the surgeon than to see urine once more escaping per vaginam after a tedious and painstaking effort to close the leak. And yet, if the patient determines to leave matters *in statu quo*, she condemns herself to a most miserable existence, the object alike of pity and disgust to all her friends.

Anything like success in the treatment of vesico-vaginal fistula would appear to be a matter of comparatively recent history. Sir James Simpson, writing in 1859, says: "With others I used to regard a patient afflicted with vesico-vaginal fistula as a case generally beyond all relief and all hope." Cumin in 1824 says: "The hopeless nature of these fistulæ is generally acknowledged, and by many they are at once abandoned as incurable"; and Richerand declared that frequent ablutions and a urinary were the *only* means calculated to diminish the trouble inseparable from this disgusting infirmity. And although, as Milton's list shows, present results are not all that could be wished, there has, curiously, been little alteration in the mode of attack by the surgeon during the past fifty years. If the later writers, as Clifford Allbutt and Playfair are consulted, it will be found that all the operations mentioned date back many years, and that in all the edges of the fistula are, without exception, the parts attacked. That they shall first of all be made raw is the essential preliminary, whether the paring method of Sims, Bozeman, Simon, and others, the splitting method of Langenbeck, Collis, and Tait, or the elytoplasty of Jobert and Milton be adopted; the various paring methods differed only in the various angles which the pared surface bore to that of the bladder, the importance attached to preliminary preparation of the patient, the use or non-use of clamps to hold the ends of the stitches or to regulate the position of the flaps, the material of which these stitches were composed, and the position of the patient during operation. The splitting method was the same, whether practised by Langenbeck, Collis, or Tait, and consisted in the splitting from the edge outwards of the tissue between bladder and vagina, so as to obtain a large raw surface at this point. Elytoplasty supplied flaps from various parts of the surrounding tissue, but to fix them in place it was first of all necessary to pare the edges of the existing opening and to fit and suture the raw edge of the flap to these.

The only operation which did not interfere with the integrity of the fistulous edge was the method of desperation, that of kolpocleisis, which transformed the upper part of the vagina into a portion of the urinary reservoir, preventing any escape of the menstrual fluid except through the bladder, and might have been expected effectually to prevent further pregnancy. A case is, however, on record in which this unexpected occurrence actually happened, coition having

probably taken place through the dilated urethra. It may be accepted, then, that except in those cases in which any return to the *statu quo ante* is given up as hopeless, the one subdominant idea in the minds of all surgeons who have attacked these cases has been the absolute necessity of a raw surface at the edge of the fistula as the essential preliminary. But is this so essential? Could we not by any means transform this obstacle, on the removal of which surgeons have expended so much time and ingenuity, into our greatest help towards success?

In describing what I think is a novel method I wish to be understood as referring simply to vesico-vaginal fistula, and not to vesico-uterine fistula, although it is suitable for those in the anterior fornix as well as for those lower down in the anterior wall; practically but little is lost by this, since Neugebauer estimated the cases of fistula involving the cervix as only forming 8 per cent. of the whole number, and Hermann and others have pointed out that in the most frequent class, that produced by prolonged pressure of the child's head upon the maternal tissues, the head rarely becomes impacted until after the cervix has dilated and retracted. So far as other causes, such as removal of calculus through the vagina, pressure of impacted pessary, traumatic injury to prolapsed and distended cystocele, as in a case of Kynoch's, go, these will all act on the vaginal wall alone.

During the last two years my attention has been directed to the subject of fistula generally, and especially to the often unsatisfactory result of the usual operation for fistula in ano. It occurred to me that if it were practicable, good results might be expected from separating the fistulous tube as a whole from the tissues around up to, but not through, its connexion with the rectal wall. Sufficient of this tube should then be removed to leave a projection which could be inverted like a glove finger by means of threads attached to its distal periphery and passed through the fistula into the dilated rectum; by pulling upon these the fistulous tube might be inverted into the rectum and fixed by tying a ligature around it just above the level of the bowel wall. What had been its raw outer surface would now be its inner and might be expected to unite with rapidity, whilst the raw surfaces left outside might be immediately united by sutures. The prolapsed inverted tube might then be partly cut away inside the rectum and the ligature left to cut through the remainder, which would not be likely to happen before the outer structures were solidly united. So far I have not been successful, partly because of the action of the sphincter, but mainly because the fistulous track is very seldom a single tube, but usually burrows in various directions. But neither of these objections hold good with reference to vesico-vaginal fistula. Here we have a short straight track, and if there are muscular movements in the tissues around they are more under control, and will be of importance only if there is coincident tension. The tube, however, as it exists, at first sight would be far too small to have any appreciable effect in stopping the gap; but if, instead of looking upon the edge of the fistula as the limit of our available tissue, we regard it simply as a hinge upon which a tube of mucous membrane taken from the vagina and spreading outwards may be made to turn, we have at once at our disposal as much as may be necessary to close any but the most extensive gaps. Both bladder and vagina are lined by the same kind of tissue, mucous membrane, and it is the continuation of this over the edges of the rent which has been heretofore the greatest trouble. Supposing exception to be taken to this, and the edge be looked upon as scar tissue pure and simple, still it is the same tissue as that which it is intended to form by any of the other operations, with the cardinal advantage that it is old and tough, and has passed beyond the dangerous stage in which absorption of deleterious matters is possible.

It is clear that it is the re-formation of the bladder which is the essential point. The union of any raw surfaces in the vagina, although important, is of but secondary importance except so far as it may support or strengthen the re-formed bladder wall. If, then, we utilize the vaginal mucous membrane, not as Jobert or Milton, by displacing it as a flap with two raw edges, which require suturing to the equally raw edges of the prepared fistula, with a granulating surface exposed to the action of urine, but with the mucous surface turned towards the bladder cavity, where alone that kind of surface is of primary importance, and with no break in the edges at all, but making a perfectly continuous surface up to a narrow point of union, we shall have gone far towards solving the problem, and the loss of material in the

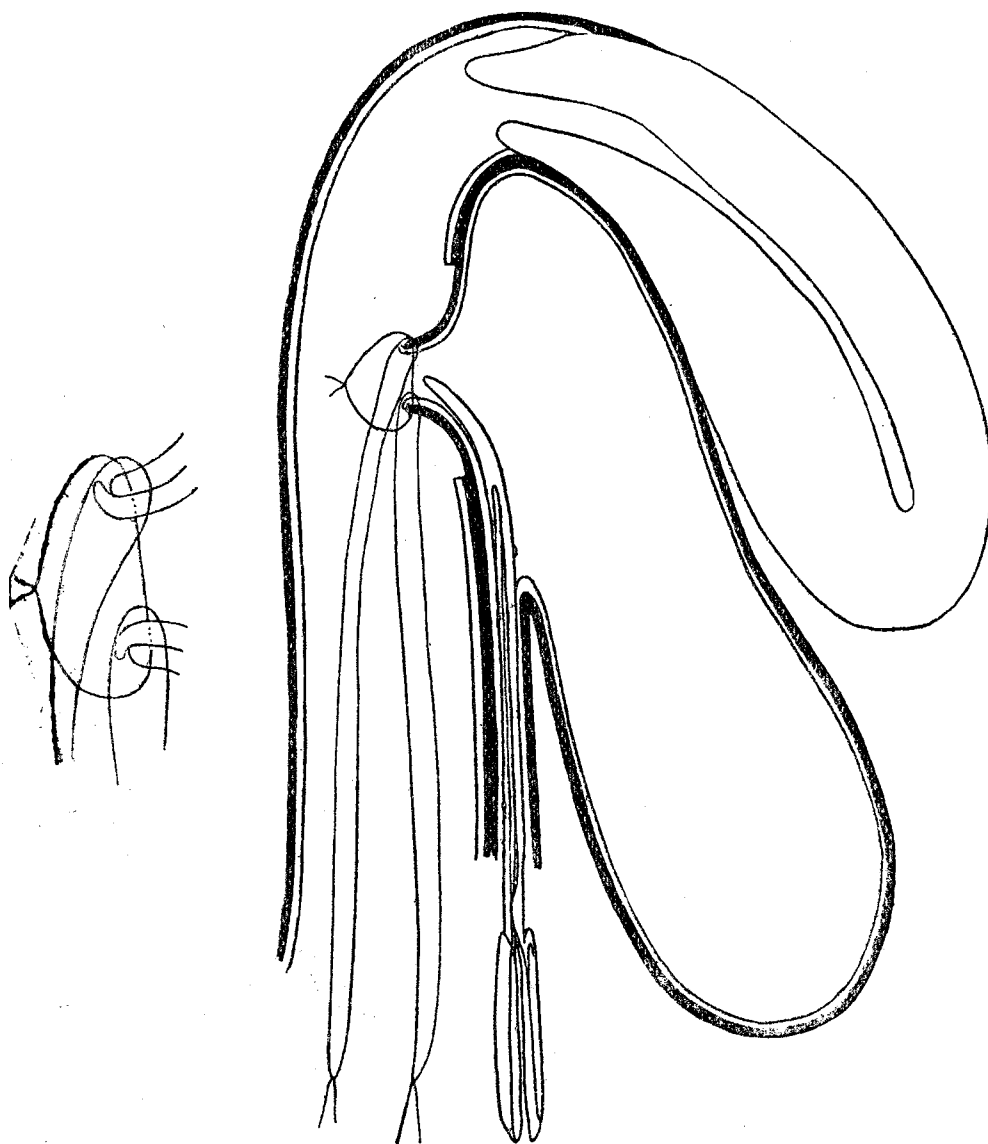
vagina will be of very little consequence compared with the advantage obtained.

Acting upon these ideas I suggest, and have carried out with immediate success, the following operation. I pass over, as understood, the extremely necessary preliminary preparation of the patient. The accompanying diagrams will make clear the steps of the operation and the idea of it almost without description. In Fig. 1 it will be seen that a circular incision has been made

that mucous membrane will face the bladder, whilst the raw connective tissue surface will face itself and come easily together at the level of the bladder-wall, whilst the innermost edges project as a tube into the bladder cavity; the advantage of this will be shown directly. Whilst traction upon these threads is very gently but firmly maintained, and before the frill is inverted, a fine silk suture is carried round it just above its extremity, the suture passes through the connective tissue, but carefully avoids the mucous membrane.

(Fig. 3, enlarged detail). It lies like a purse-string, and it is tightened up just after the inversion takes place. It draws together the raw surfaces of what before inversion was the outer, but is now the inner surface of the frill, and closes the upper extremity of the tuft. When knotted, the ends of this suture are cut off short, and the whole suture is buried by the further inversion produced by a continuance of the traction upon the guiding threads. As soon as this inversion has been carried to such a point that the surfaces of the flaps lie easily in apposition at the level of the bladder-wall another circular suture is applied in the same way and knotted, the ends being cut off. In small fistulae only one of these sutures may be required; that should always be the one at the level of the bladder-wall. The guiding threads are now divided and drawn out through the urethra, leaving the base of the bladder re-formed (see Fig. 3). As is well known, divided mucous membrane tends to curve over its raw edge. When, therefore, the first suture is tightened the upper surface of the tuft will present nothing but mucous membrane. Fig. 4 shows the appearance of the fistula from the vagina at this stage. The raw surfaces in the vagina, if sufficiently small to be drawn together without tension, are now united by silkworm gut sutures, the ends of which are left long to permit of easy removal. If, however, any tension is likely to be produced, it is better, I think, to apply at once a Thiersch graft taken from some non-hairy portion of skin. This is covered by oiled silk or gutta-percha tissue, and carefully pressed into position. I find careful packing of the vagina with iodoform gauze better than sutures to fix this in position. The patient is made to lie upon her face for ten days, and

FIG. 1.



The flap has been separated and turned into the vagina; two guiding threads are shown in position and the first uniting thread, which passes only around through the connective tissue and muscular coat avoiding the mucosa. A pair of bent forceps is passed through the urethra, its point entering the vulva through the fistula. The guiding threads will be turned up into the vagina and their knots placed between the jaws of the forceps.

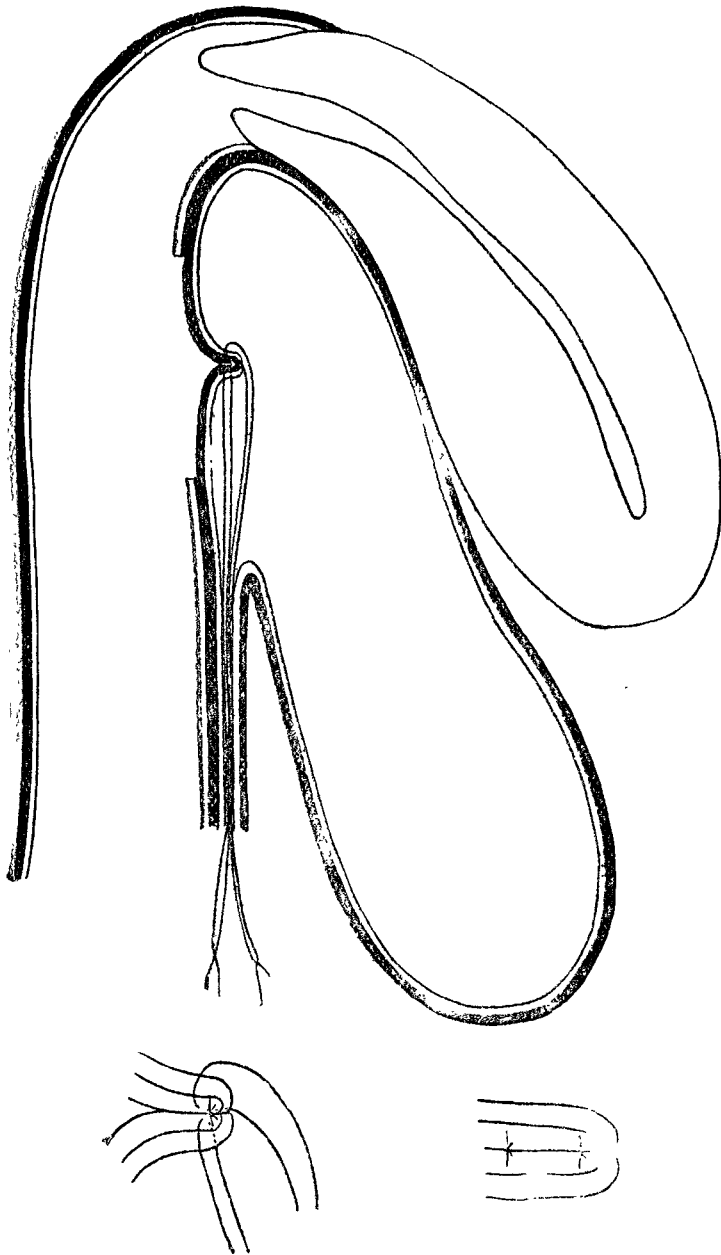
around the fistula, passing through the mucous membrane and part of the subjacent tissue, so that a continuous flap of sufficient thickness can be raised and separated up near to, but not through, the angle at the fistulous edge; the width of this flap must be judged by the surgeon in each particular case. It must, however, be wide enough, when brought together in the way to be described, not merely easily to close the opening, but to project for about a fourth to third of an inch into the bladder cavity at the centre. When so separated it lies like a truncated glove finger attached solely at the edge and continuous with the mucous wall of the bladder. To four equi-distant points in this frill four long double threads are attached, but not knotted, so that they will easily pull out. Each pair is knotted at their ends outside the vagina. Of course, in a section such as shown only two of these double threads can be indicated. When this is done a curved pair of forceps is passed through the urethra until its beak appears in the centre of the frill, the four pairs of threads are brought together, and their knotted ends placed within the grip of the forceps. As this is withdrawn, closed, it will carry the threads through the fistula, through the bladder, and out through the urethra. Gentle traction upon these (see Fig. 2) will invert the circular flap into the bladder in such a way

the catheter is used every two hours the first three or four days.

The advantages I conceive to be obtained by this method are:—1. There is no tension upon the uniting surfaces. 2. Mucous membrane is opposed to the action of urine—that is to say, the contents of the bladder find themselves in contact with the kind of tissue to which they are normally suited and accustomed. 3. The cubic capacity of the bladder is not greatly decreased, as is the case after most of the other operations, but is left normal; therefore, the resulting cure is not discounted by persistent frequency of micturition in after life. 4. The uniting sutures are separated from the contents of the bladder by the entire thickness of the mucous membrane. 5. The uniting surfaces are also thus protected; with the patient on her face, if any urine is projected against the tuft it will drip from its outer layer, which is mucous membrane. 6. Should the ureter be exposed at the edge of the fistula, or should its orifice, which happens in most cases, be near it, it will not, as in the old operation, discharge right on to the line of union, but into a gutter formed of mucous membrane, which cannot be damaged by such discharge, and it will also be noted that it is impossible for the ureteral canal to be compressed by a wrongly-placed stitch, fixed in the middle of the scar, or left outside the re-formed bladder—it must necessarily be

turned in by the flap thus formed and left in a safe position. 7. In old cases—where, especially, freedom from muscular traction is of most importance—we are provided with a natural replica of Simpson's splint in the tough edge of the fistula, now surrounding the uniting tissues, all the

FIG. 2.



In Fig. 2 the guiding threads have been drawn through the urethra pulling the circular flap or frill into the bladder. The first uniting thread has been drawn tight and knotted, closing the upper extremity of the frill. This is shown also in enlarged detail. The two uniting threads are shown tied, and the frill thus closed above and below.

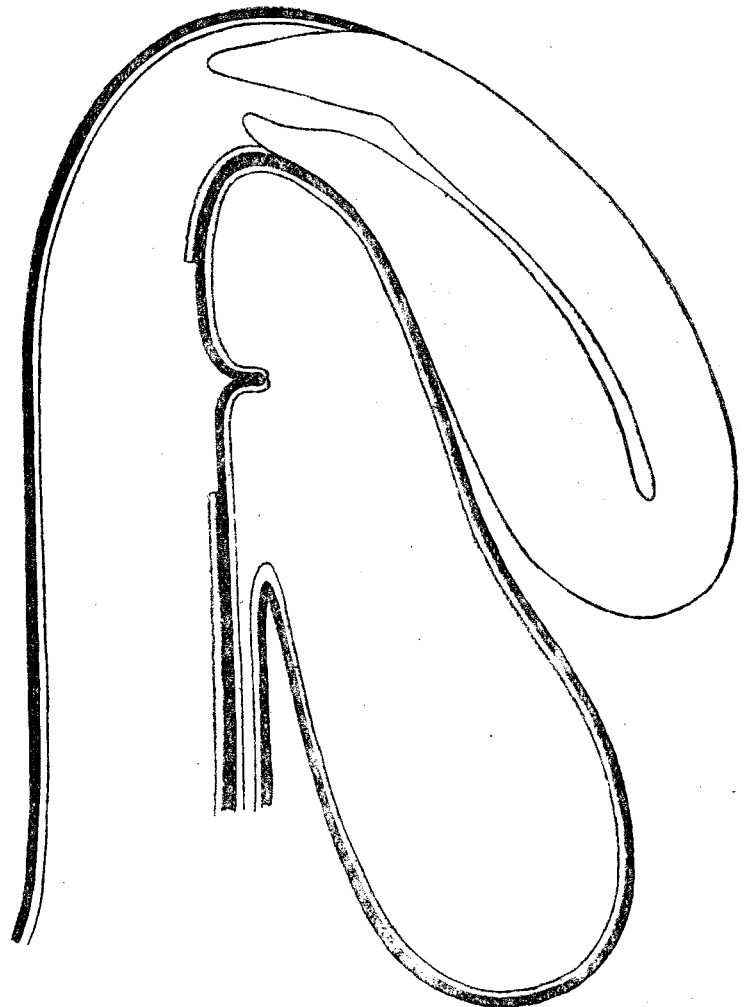
more effective because it is situated in the tissues themselves. This is another instance of the way in which the altered conditions produced by the operation transform the previous obstacles to success into distinct advantages.

Since this paper was written my attention has been called to one by Professor Ferguson, of Manitoba, in the *American Journal of Obstetrics*, and it is evident that the principle of reversal of mucous membrane from the vagina, which I thought had been original, has been anticipated by him. His operation, however, is otherwise quite different from the one I have described, and does not, I submit, appear calculated to gain all the advantages which are possible. Professor Ferguson separates the mucous membrane of the vagina in much the same way as I have shown, but he makes his flaps only large enough to meet one another easily on a level with the floor of the bladder. They are united in that position by a continuous suture, avoiding the mucous membrane so as slightly to invert the line of union. There is no attempt to pull them inwards into the bladder or to agglutinate them together into a tuft. In all cases the vaginal wound is directly united by interrupted sutures. It appears to me that, first, the resulting line of union will be practically on the same plane as that of the bladder wall, therefore the amount of uniting surface will be

much less, consequently the risk of yielding, both immediate and secondary, will be much greater. And most of all, the discharge of urine from the ureters will play directly upon the uniting edges and may very easily contaminate the sutures. As Simpson said in criticising the operations of his day: "There is the danger of infiltration of urine between the raw lips of the wound on the vesical side, provided the internal surfaces of the lips are not entirely closed, which they can scarcely in all cases be expected to be, by the sutures employed." Perhaps the difference between the two operations will be even more clearly apparent if I refer to a kindred condition, differing mainly in position. In supra-pubic cystotomy, when for some reason the bladder has not been immediately closed, a time will come when the opening is no longer required and closure is desired. Closure will here sometimes occur from simple cicatrisation, but now and then it does not. If the bladder-wall be separated from the abdominal, the edges of the opening in the former pared and simply brought together by sutures, one often fails to get primary union, and leakage again occurs; but if the circumference of the opening be drawn in by threads which are carried through the urethra, and the outer surface drawn together by a purse-string suture, the result will be found to be perfect. At least, I have had that double experience.

It would, of course, be presumption to suggest that this method will meet the requirements of every possible case. He is the best surgeon who, with full knowledge, chooses the method best fitted for the individual case which engages his attention, but the more methods he has at his disposal the better will he be equipped and the more likely are his

FIG. 3.



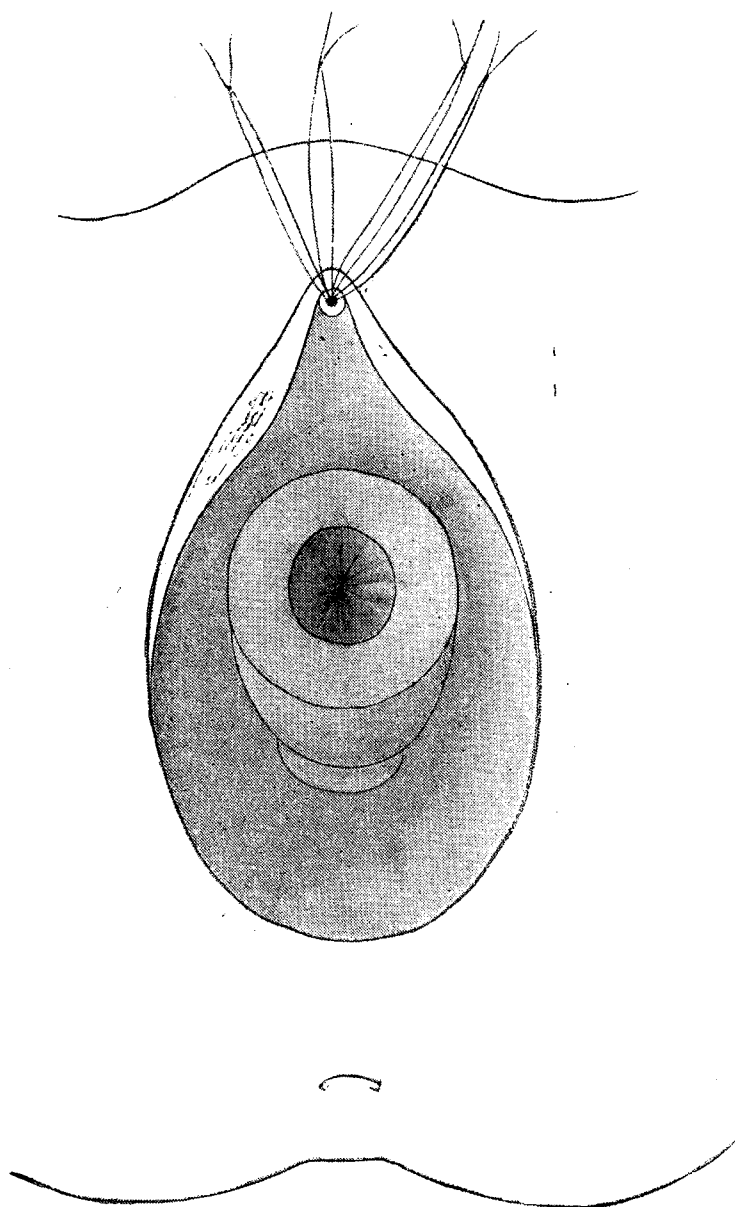
The guiding threads have been divided and withdrawn, leaving the base of the bladder re-formed with no threads exposed to the action of the urine.

efforts to be crowned with success. The following cases show the result so far obtained. It will be noted that in all there was never the slightest leakage from the time of operation.

CASE 1.—A medium-sized woman, aged thirty-one years, was admitted to hospital on Sept. 22nd, 1896. She had had two children. In the case of the first—who was at this time ten years old—labour was easy, and there were no after-effects. The second was a six months

dead child. Labour was tedious and was terminated by instruments. The patient had no difficulty with the urine directly after her confinement, but about a fortnight after she first noticed urine trickling from her vagina; this had become much worse lately. She was in bed for three weeks after confinement with, she says, rheumatic fever. In front of the cervix and about half an inch from the vaginal reflexion was an opening which admitted barely two fingers. The opening was smooth and the edge thin. The vagina was slightly excoriated, but there were no deposits. The urine was of specific gravity 1015, acid, and with a very faint trace of albumin. After careful douching, &c., the vagina appeared to be healthy. On Oct. 6th the operation was performed with one purse-string suture. The vaginal wall was united by interrupted silkworm gut sutures. The patient was placed on her face. A catheter was inserted and kept *in situ*. The vagina was irrigated daily with

FIG. 4.



Shows the appearance of the re-formed bladder from the vagina. The guiding threads are shown issuing from the meatus.

boracic solution. There was no leakage after the operation. On the 17th the vaginal sutures were removed and the wound healed. The patient could pass urine herself. On the 29th she was discharged, when she could hold urine six hours easily.

CASE 2.—The patient was a tall, masculine looking woman, aged twenty-eight years, with a flat pelvis. She had had one confinement, which lasted two days and was terminated by craniotomy, which occurred one year previously, when she was five weeks in bed. She had noticed a leakage before getting up. On Nov. 3rd, 1896, the opening admitted two fingers easily; the vagina was tender, somewhat raw, and encrusted in small patches. The urine was slightly alkaline and of specific gravity 1016. By the 20th careful nursing and the use of salol and mineral acids with local treatment produced a fairly healthy vagina, with acid urine, and

the operation was performed with two purse-string sutures. A graft was taken from the thigh below the trochanter. The vagina was packed with iodoform gauze. The patient was placed on her face and the catheter was passed every two hours. There was no leakage of urine. On the 23rd some gauze was removed and the vagina was repacked. On the 26th there had been no leakage and all the gauze was removed. Almost all the graft had united, except at one side. This was sloughing and nearly separated, and was cut away, leaving a raw space measuring one inch, which was, however, cicatrising. Douching was performed daily with boracic solution which was followed by insufflation of dermatol. On the 30th there was still no leakage. The patient had passed urine herself. She was not allowed to hold it for more than four hours, but she could do so. She was placed on her back. The vaginal wall had nearly healed. On Dec. 10th the patient was allowed to go home. There had been no leakage. She could hold urine for six hours. The vagina was perfectly healed and felt supple. The grafted patch felt somewhat thinner and smoother than the remainder, but there was no bulging.

CASE 3.—A medium sized woman, aged forty years, married at the age of thirty-five years, had had one child seven months previously to coming under my notice. The labour was tedious, but no instruments were used. A leakage was found on the fifth day. Convalescence was slow. There was no fever. The patient had undergone one operation by another surgeon, but the leakage returned; she was not sure how soon after, but thought that there was some during the first week. On Jan 2nd, 1897, there was an opening of the size of half-a-crown in the anterior wall near the centre, the edges of which were scarred. The patient was very cleanly and the vagina was only slightly sore. The urine was acid, of specific gravity 1020, and there was no albumin or sugar. On the 5th the operation was performed with two purse-string sutures. The vaginal edges were approximated with silkworm gut, two lateral incisions being made to relieve tension. She was placed on her face. Daily douching was performed after the first four days, during which the vagina was lightly packed with iodoform gauze. The catheter was used every two hours for two days, after which she passed urine naturally, but was not allowed to hold it for more than three hours at a time. On the 20th the vagina had healed. The suture was removed on the 13th, and the patient has had no leakage since the operation.

Manchester.

A CASE OF ADDISON'S DISEASE IN A CHILD TREATED FOR A FEW DAYS WITH SUPRARENAL EXTRACT WITHOUT BENEFIT; CHARACTERISTIC LESIONS FOUND POST MORTEM.

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THE following case is noteworthy on account of (1) the early age of the patient—Addison's disease being exceedingly rare under the age of fifteen; (2) the history of a temporary discolouration of the skin occurring one year before the onset of the definite symptoms of the disease; and (3) the family history of phthisis and of brain disease. As regards the treatment of Addison's disease some recently reported cases strongly suggest that an extract of the suprarenal capsules may prove to be of great service. Many of these cases are reviewed by Dr. Ringer and Dr. Phear in a paper published in the Transactions of the Clinical Society for last year. They record a case of their own in which temporary improvement followed the administration of suprarenal extract; the pigmentation diminished in intensity and the patient became brighter and stronger.

A girl, aged thirteen years, was admitted under my care at the Manchester Royal Infirmary on June 6th, 1896. Her mother told me that she was always a delicate child, was easily tired, and always seemed to be very sleepy. When an infant she attended a children's hospital for rickets and diarrhoea, but did not suffer from any other definite illness before the present one. She had never had a severe fall or