

# URINARY FISTULAE IN WOMEN

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### HISTORICAL

FISTULOUS communications between the genital apparatus and the adjacent urinary tract are among the most troublesome and deplorable diseases women are liable to suffer from. There can be no doubt that these infirmities existed from time immemorial. An extensive urinary fistula was found by Professor Derry (1935) of Cairo in the mummy, or more correctly, the dried-up body of a woman called Henhenit, who was one of six ladies in the court of Mentuhotep, of the eleventh dynasty, who reigned in Egypt about 2050 B.C. The pelvis of this woman is dolico pelvic and considerably contracted in its transverse diameter. In Figure 1 which represents the anterior surface of the mummy you can see: (1) the enormously dilated bladder, (2) the thickened infected lining of the bladder, and (3) a large vesico-vaginal fistula. When I examined this mummy myself I found an extensive complete tear of perineum. This finding supported the deduction that the fistula was the result of difficult labour. In Figure 2 you can see the tear in the perineum. The line of junction of the skin with the granulating surface of the tear can be distinguished by the difference in colour between the brown skin and the bluish granulating area. I have cut sections from the edge of the perineal tear near the rectal side for microscopical examination. In Figures 3 and 4 we see: (1) a vessel, (2) vacuolated fibrous tissue and (3) muscular tissue. It is most unusual to find such preservation of tissues four thousand years after the death of the subject. Apart from the accidental discovery of this urinary fistula in the mummy of Henhenit no mention of this infirmity is found in books on ancient medicine.

It is indeed surprising that a lesion so palpable, with symptoms so obtrusive as urinary fistulae,

should pass unnoticed by all Greek and Roman writers. The first mention I came across was in *Al-Kanoon*, the celebrated work of Avicenna, the Persian physician whose millennium was celebrated in Teheran 5 years ago. This careful observer says in the chapter on "Contraceptives" that measures to prevent pregnancy should be adopted by girls who get married too young. Their labours, he adds, are often difficult and may be followed by incontinence of urine. Reference to fistula was also made by him in the chapter devoted to vaginal atresia. In this chapter he describes an operation for the treatment of this lesion which consists of dissecting a passage between the bladder and rectum, and warns the surgeon to take the greatest care in avoiding injury of the bladder while making this dissection, lest the patient might have incontinence of urine from which she has not the slightest chance of ever being cured. The first reference in European literature to this infirmity was made by Platter in 1597; but nothing was suggested by him in the way of treatment. During the next hundred years several clear descriptions of urinary fistulae following difficult labours appeared and surgeons diligently attempted to cure them by surgical operations. Their attempts entirely failed. In spite of their failures they still carried on, with never flagging patience trying new methods, when one by one the older methods proved themselves useless. But it was only in 1663 that the first glimpse of hope appeared, when Van Roonhuysen of Amsterdam proposed to close fistulae by denudation of tissues and suture. He might have had an occasional success, but it was Fatio who published in 1752 the details of 2 successful operations that he had performed many years before. He placed his patients in the lithotomy position, and exposed the fistula with a speculum. He then refreshed the edges with a

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delicate pair of scissors, and brought them together by passing sharpened quills through them and winding a thread over the ends of the quills.

Eighty-two years later (1834) Jobert de Lamballe planned and put into execution an operation which consisted in pulling the cervix down by traction. This was followed by a broad denudation of the edges of the fistula, and an exact approximation of the edges by interrupted sutures. In difficult cases he advised making wide incisions in the lateral vaginal walls, in order to relieve tension on the sutures. In cases in which he found the cervix densely implicated in scar tissue he advised liberating it from the bladder by making a transverse incision in the vault of the vagina. He called this procedure "Opération par Glissement". Jobert de Lamballe had a few successful cases by using this method; but his followers, attributing the success of his method to the sliding of the flaps, failed entirely to grasp the value of wide denudation of the edges of the fistula. In their hands the operation was a complete failure. In 1841 Ryan of the Metropolitan Free Hospital in London claimed many successes by nursing patients who developed fistulae after labour on their face or side, tying a catheter in the bladder and plugging the vagina with oiled lint. Cure of fistulae by operation was at that period considered hopeless, so much so, that Frederick Dieffenbach, a great master of plastic surgery, wrote in his book on operative surgery published in 1845: "It is with shame that we must still acknowledge that the lucky cure of a vesico-vaginal fistula must be always reckoned among the rarest occurrences."

This state of pessimism did not last long, as 7 years later (1852) Sims of Alabama devised and published a technique in which he denuded the edges of the fistula in a funnel-form down to, but not including, the vesical mucosa and suturing the edges of the fistula by silver-wire sutures which he applied at suitable intervals, and secured with clamps consisting of 2 parallel bars. He obtained, by following this method, 230 cures in 312 patients. This was a truly marvellous achievement considering that most of his early cases were done in the pre-anaesthetic pre-antiseptic days. In 1858

Bozeman, a young American surgeon, a pupil and disciple of Marion Sims, came to Paris and successfully operated on a large number of fistulae in different hospitals, placing his patients in the Sims' semi-prone position and using the duckbill speculum invented by his master. He used a head-mirror to reflect light on the field of operation. Sims himself paid a visit to Paris 3 years later and demonstrated his technique which was greatly admired by French surgeons. He attributed his success to the wide denudation of the edges and the use of silver-wire sutures and constant drainage of the bladder by a catheter tied in the urethra. The use of silver-wire was undoubtedly a great improvement on unsterilized silk which was used at that time; but it was not an innovation with Sims. Luke of Charing Cross used it in closing fistulae in 1850; but Sims has the credit of popularizing its use in America and elsewhere. In Great Britain, according to Pozzi and Jayle, two contemporaries of Sims, Baker Brown and Simpson, were obtaining successes, in London and Edinburgh, in the treatment of fistulae using silver-wire and devising several new instruments.

After his visit to Paris Sims went to London, where he had a grand reception. An account of this visit is given by McKay (1922) in his book *Lawson Tait, His Life and Work*. It runs as follows:

"About Marion Sims, Tait spoke frequently, and always with admiration. He considered that as far as America was concerned Sims was the father of gynaecology there, if not the father of modern gynaecology. Tait mentioned to me that the first time he met Sims was at one of the annual meetings of the British Medical Association. He was sitting on a bench waiting for the meeting to open, when he heard a man with a very pronounced Yankee accent say: 'There is one man I have come here to meet, a young fellow called Lawson Tait: I want to have a talk with this young fellow.' Tait introduced himself and became, ever since, a life-long friend of Sims. Tait also related to me that, in a conversation he had with Sims, he alluded to Sir Henry Thompson's operation on the French Emperor as being one of the best instances of bad luck that he could remember, Sims, in

answer said 'I'll tell you another instance almost as bad. During my visit to London I was asked to perform an operation on a case of vesico-vaginal fistula at the Samaritan Hospital. The case was a difficult one, but the operation was in every way satisfactorily performed. The patient, however, died six days later and a post-mortem revealed the fact that I had closed both ureters with the sutures. I performed the same operation hundreds of times in America and yet this was my first death.'” One of the most important contributions of Sims's work on fistulae is found in a book of 250 pages published in 1868 by Emmet, Sims's most distinguished pupil, who, according to Howard Kelly, acquired greater technical skill than Sims and added to his technique many important additions of his own. Sims himself who was excessively occupied and travelling from one place to another kept few or no records of his work. Without Emmet many of the most important details necessary for the success of the operation would never have been brought to the world.

Shortly after the publication of Emmet's book two general surgeons at Kasr el-Ainy Hospital in Cairo, Dorry Pasha and, at a later date, Herbert Milton were getting great success in the treatment of urinary fistulae using Sims's method and a dedoublement technique developed locally. Herbert Milton published his cases in *St. Thomas's Hospital Reports* and described a new method for the treatment of wide destruction of the base of the bladder by transplantation of flaps taken from the vulva. Unfortunately Dorry Pasha did not publish his results but you will see in the film which will be projected after the lecture the box of instruments which he used in operating on fistulae.

For many years Sims's method remained the operation of choice; but gradually it began to show unmistakable signs of falling into disuse, owing to the advent of better methods. In spite of this it still has great admirers, foremost of whom is Chassar Moir of Oxford, who in 1954 published a series of 100 consecutive cases of fistulae in which he obtained, by a modified Sims's method, a 100 per cent cure. This method undoubtedly gives very good results in suitable cases in the hands of experienced surgeons, but the consensus of opinion nowadays is in favour

of the flap-splitting operation originated by Martin (1879) and Sanger (1888) and developed by Mackenrodt (1890-91). This operation consists in detaching the bladder on all sides from the vagina, and sewing the bladder flaps and the vaginal flaps independently to each other. A prototype of this operation was published by Maurice Henry Collis in 1861, almost thirty years before Sanger and Mackenrodt published their method. To do Collis justice I shall publish the following extract from his paper in which he describes the details, and emphasizes the merits of the procedure over Sims's operation which was then in vogue.

“The operation,” (he says) “consists first in splitting the margin of the fistula all round, so as to separate the vesico-vaginal septum in two equal portions, one half consisting of the vaginal mucous membrane and submucous tissue, the muscular portion of the septum being equally divided between the two. Anyone (he goes on to say) who has removed a ring of mucous membrane from ever so small a fistula will have observed how large it becomes under the process, and sooner or later will have probable cause to regret the loss of substance thus entailed; whereas, in my operation, if it fails, it leaves the patient in no worse condition for subsequent treatment than before. Moreover, in large gaps, where the loss of substance is to be measured by square inches, no person could expect union by simply paring the edges and drawing them together by interrupted sutures. The strain on the threads would be too great, and they would inevitably cut out.”

It is remarkable that Collis's method is not to be found described in any of the English, French, German or American textbooks, except that of Lawson Tait, published in 1889. Lawson Tait adopted and popularized Collis's method and seems to have had great success with it. The following whimsical passage quoted from his book *Diseases of Women and Abdominal Surgery* gives you an idea of the frequency of urinary fistulae in his days. It runs as follows:

“I have already said that operations for vaginal fistulae are rarely paid for, except in gratitude, because the patients are nearly always poor. I must have operated on two or three

hundred cases, and I have not yet been remunerated to an extent which would pay for the instruments I have bought for the purpose."

In spite of Sims's successes the gloomy prospect of curing a fistula by vaginal operation prevailed. In 1872 Sir James Young Simpson said in his book *Clinical Lectures on the Diseases of Women*: "A urinary fistula is an infirmity which is beyond all relief and all hope." It is this atmosphere of pessimism that encouraged surgeons to try some way of approach other than the vaginal, to cure these fistulae.

In 1890 Trendelenburg made a radical departure from all the foregoing methods by opening the bladder suprapubically and extraperitoneally, freeing the bladder wall around the fistula and closing the defect with catgut. von Dittel in 1893 opened the peritoneal cavity, detached the bladder from the uterus, and closed the fistula by catgut.

These techniques did not appeal much to gynaecologists but genito-urinary surgeons find them suitable for all forms of vesico-vaginal fistulae.

The year 1894 showed a great advance in the operative technique for the cure of fistulae, when Mackenrodt published the flap-splitting technique which bears his name. All later techniques are simply modifications of Mackenrodt's operation adopted to suit the different types of fistula.

#### AETIOLOGY

The majority of urinary fistulae in Egypt are the result of pressure necrosis following a long and difficult labour.

The process is as follows: When labour becomes difficult on account of disproportion between the pelvis and the presenting part, or when the presentation is abnormal, the uterine contractions increase in strength and endeavour to force the presenting part through the brim. The membranes protrude and premature rupture occurs. The uterus, in such cases, usually passes into a state of tonic contraction. The presenting part is forced against the brim and either gets tightly impacted therein or in the pelvic cavity as the case may be. In cases in which impaction at the brim occurs before full dilatation of the cervix the continued pressure

on the insufficiently effaced and undilated cervix, as well as on the vault of the vagina and the bladder, will cause necrosis and ultimately sloughing of these tissues and the formation of a fistula that may implicate the cervix, bladder and ureter. In some of these cases spontaneous healing of the bladder lesion may occur and the ureter alone, on account of the constant dribbling of urine from its orifice, remains open giving rise to a uretero-vaginal fistula.

If the impaction occurs in the pelvic cavity or at the outlet the urethra and base of the bladder as well as the trigone will be lying in the direct plane of compression. In these cases vesico-vaginal and urethro-vaginal fistulae may occur. If compression of the presenting part occurs at the outlet and lasts for a long time the entire urethra may slough away. In grossly neglected cases the whole vagina may slough away and be replaced by a narrow slit surrounded by scar tissue and pervaded by fistulous tracts. Diverticula may be formed in the vault of the vagina or inside the bladder where the urine stagnates and leads to the formation of stones.

The process just described accounts for the majority of fistulae which occur as a result of labour, but fistulae following labour can also occur from direct injury during the operative procedures used for delivery. The perforator may slip and go through the vesico-vaginal septum, or the forceps may cut through the septum if the vagina tightly embraces the head of the foetus. The vaginal vault and cervix may also get nipped by a blade of the forceps or cranioclast if wrongly applied and give rise to extensive bladder and ureteral injuries.

These complicated cases have formed the bulk of patients on whom I had to operate during the last fifty years. Before 1919 the overwhelming number of fistulae met with in Egypt was a sequel of neglected labour. The number of cases was so great that I devoted a ward of 10 beds to urinary and faecal fistulae and the beds were always full. Late in 1919 I opened the first antenatal clinic and extern maternity department in Egypt. In 1920 I opened three more.

Success of this project was overwhelming. Thousands of cases were delivered every year in their own houses by the medical students and

pupil midwives under full supervision. Seven years later the Ministry of Health was encouraged to open centres in different parts of the country. The number of patients delivered in these centres in 1955 amounted to a quarter of a million.

In countries, like yours, which were ahead of us in adopting expert obstetrical services, the number of fistulae due to faulty obstetrics has fallen considerably, but unfortunately this decrease in number has been almost balanced by a higher incidence of cases due to surgical operations. American and European literature teems with reports on accidental injuries to the ureters and bladder as a sequel to surgical operations. In Chassar Moir's (1954) article on 100 cases of fistula previously referred to 36 cases only resulted from obstetrical causes, while the gynaecological group accounted for 64. The operative procedures which accounted for the majority of the fistulae in his series were difficult pelvi-abdominal operations except in 18 cases in which the fistulae followed simple colporrhaphies. Some of these he goes on to say were due to a fault of technique and some arose from trauma inflicted on the upper urethra by unskilful catheterization after colporrhaphy. The sling operation itself which is performed for the cure of stress incontinence of urine was responsible for 3 cases in his series.

#### THE SITUATION OF A FISTULA

In fistulae that follow difficult labour the situation depends, as I have said before, upon the plane of compression of the presenting part as well as the degree of dilatation of the cervix when this compression occurs. In this connexion I wish to point out that there is a misconception about the possibility of involvement of the ureters in the sloughing process that leads to the formation of fistulae. It used to be taught that, owing to their displacement above the brim, the ureters, in protracted labour, do not share in the compression that leads to the formation of fistulae, but are involved as the result of infection spreading to the wall of the ureter from sloughs in the vault of the vagina.

That this is not so is seen in Figure 5 which represents one of ten dissections I performed on the bodies of women who died undelivered as a

result of rupture of the uterus during labour. The trigone of the bladder, the internal openings of the ureters, as well as the upper third of the urethra, are within the area of compression. These dissections were also of help to me in clearing up another common misconception about the rarity of urethral fistulae in cases where the compression occurs in the higher planes of the pelvis. In each of the ten dissections, I found that when the bladder was pulled up it dragged the urethra upwards with it to such an extent that a good part of the latter lay in the area of compression.

#### DIAGNOSIS

The *diagnosis* of vesico-vaginal fistulae is usually very easy. If the hole is big it can be detected by placing a finger in the vagina and introducing a sound into the bladder through the urethra.

But tiny fistulae usually lie concealed in scar tissue. To detect them we fill the bladder with a coloured solution, and then retract the posterior vaginal wall by a speculum and look for the hole through which dribbling is occurring.

*Ureteric* fistulae are often difficult to find. In order to detect them we inject the bladder with a coloured solution and watch whether the fluid does or does not leak in the vagina. We can also verify the diagnosis by plugging the vagina with two pieces of gauze which we remove after two hours. If the upper one is found soaked with uncoloured urine, the fistula is evidently ureteric. In difficult cases the cystoscope is of help in determining the site of the fistula and the state of the ureteric openings.

*Urethral* fistulae are often so tiny as to escape notice. To determine their position we place a speculum in the vagina, block the meatus with the thumb, and ask the patient to strain. The fluid will be seen flowing out of the hole.

Before concluding an examination of a case of fistula we should take care not to miss the presence of more than one hole, and should also look for the possibility of the presence of calculi in diverticula in the vagina or bladder. *Associated complications* such as rectal fistulae, para- or peri-metritis, salpingitis and inflammatory lesions of the vagina and perineum should also be noted.

## SYMPTOMS

In patients who develop fistulae after labour, incontinence of urine becomes evident soon after delivery if the fistula is traumatic; but if it results from pressure necrosis cystitis first develops but incontinence occurs only when the slough begins to separate. This usually takes 4-7 days. Dribbling of urine in the vagina will be constant if the fistula is vesical or ureteral but in urethral fistula constant dribbling of urine does not occur but some of the urine passes through the hole and unpleasantly splashes the patient's parts during micturition.

The effect of the constant dribbling of urine into the vagina and out on to the vulva, perineum and adjacent tissues will soon show itself. Dermatitis with excoriations both within the vagina and outside it develop. The vulval hair becomes encrusted with salts. The parts involved become exquisitely painful. The effect of this on the general health of the patient soon shows itself. She becomes emaciated and depressed and seeks solitude and evades society on account of the penetrating smell of urine which emanates from her.

## TREATMENT

No attempt should be made to close a fistula until all granulating surfaces are quite healed up and complete involution of the pelvic organs has occurred.

Full investigation of the urinary apparatus by intravenous pyelography and excretory urography should be made as well as a full examination of the urine. A culture should be made and sensitivity to the different antibiotics of any bacteria present should be noted. In difficult and tiny fistulae the orifice of the fistula and the relation of the ureteric orifices to the edges of the fistula should be located by the cystoscope. The best time to operate, provided that the general and local conditions allow it, is at least 3 months after labour. Nature is thereby given ample time to effect a spontaneous cure of the fistula if that were possible. If the operation is delayed too long the edges of the fistula get more sclerosed and the vascularity poorer.

## SURGICAL TREATMENT

I do not intend to describe the various operative techniques advised, but shall content myself with the technique which has given me the best results.

I shall not describe the transvesical nor the transperitoneal routes for the simple reason that I have been able to tackle almost all my cases—758 besides 210 of which I kept no records—by the vaginal route. The few cases in which I failed to close the fistula from below I also failed to do so when I attempted to close it from above. The cause of failure in both routes was the immobility of the bladder produced by dense infiltrations.

The technique I follow is that of the original flap-splitting operation, with certain modifications necessitated by the nature of the case I would be dealing with. I do not practise the wide separation of the bladder advised by most surgeons who use this method; but only such separation as is sufficient to prevent tension on the sutures when tied. I do not close the bladder wall by more than one tier of sutures. I put my patients in the lithotomy position while operating, and retract the posterior vaginal wall by the ordinary Auvard's speculum. In some cases I also employ lateral specula. I try to get good exposure of the fistulae either by pulling the cervix down by tenaculum forceps if that is possible, or by putting two Little's bladder forceps at a distance of 1 cm. from the edges of the fistula. In cases where the vagina is narrowed by cicatrices I widen the vagina by making lateral incisions. In only a few cases have I had to resort to a Schuchardt's incision. I begin the operation by passing a female metal catheter into the bladder to assure myself of the patency of the urethra. I then push the catheter beyond the fistula in order to use it as a counterpoint and to help me in putting the line of union between the vaginal and bladder walls on stretch. I next make a circular incision starting at a point where I think it more likely to find the line of cleavage and then extend the incision around the fistula. If I come across scar tissue I deliberately remove it by scalpel or small scissors. I then dissect two flaps, an inner consisting of bladder wall or urethra and an outer consisting of vaginal wall. Two short

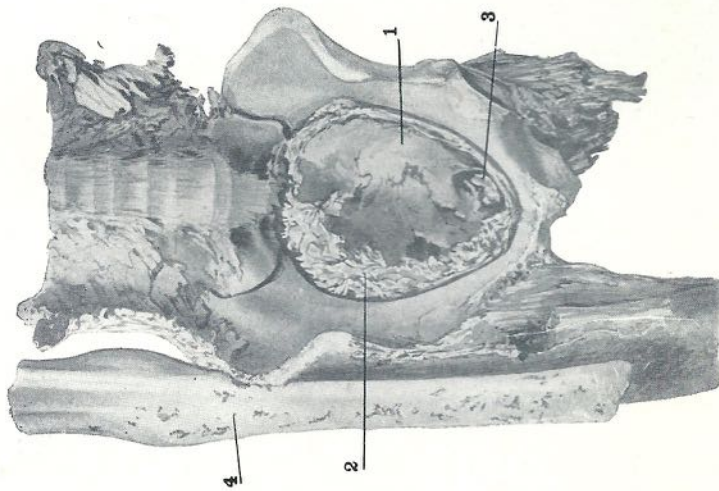


FIG. 1

Mummy of Henhenit, who was either a queen or a dancer in the Court of King Mentuhotep, 2050 B.C., showing a large vesico-vaginal fistula.

(With kind permission of Professor Derry.)

1. Bladder cavity enormously dilated.
2. Thickened and infected lining of bladder.
3. Large vesico-vaginal fistula.
4. Arm of the mummy lying at the side of body.

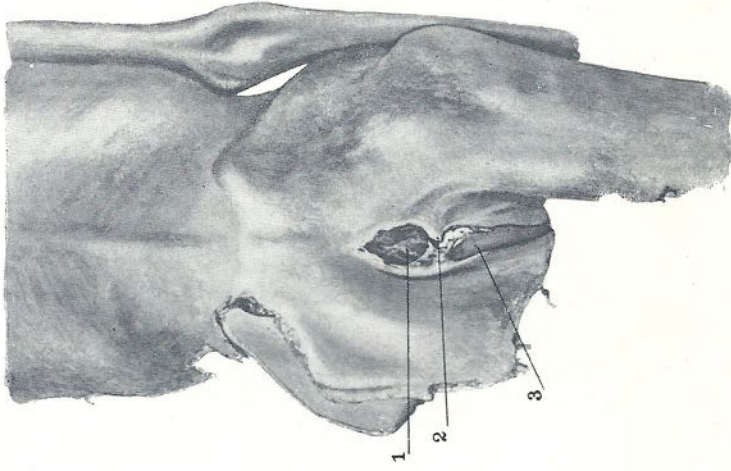
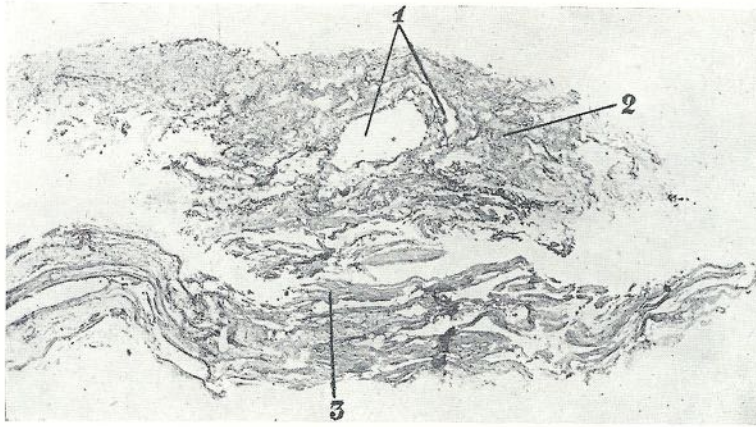


FIG. 2

Posterior surface of the mummy of Henhenit, showing a complete tear in the perineum.

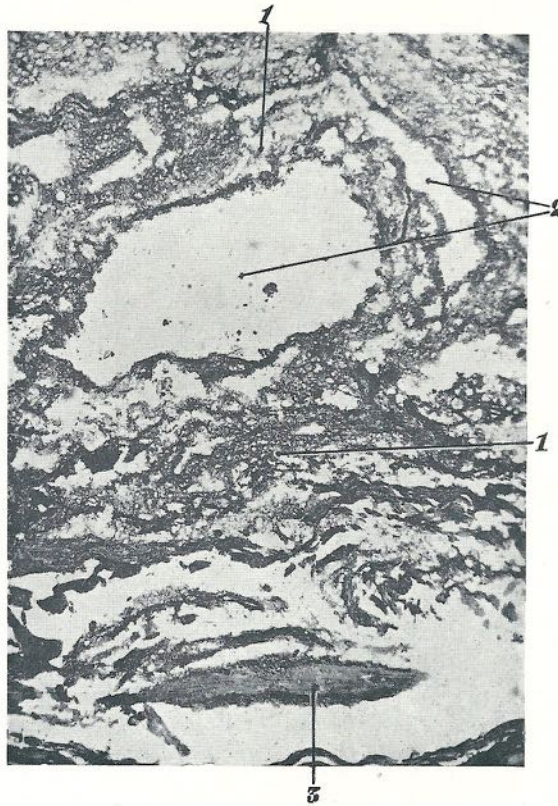
1. Anal opening.
2. Torn perineum.
3. Vagina.





A

FIG. 3



B

FIG. 4

FIGS. 3 AND 4

Sections *A* and *B* taken from the edge of a complete tear of the perineum near its rectal end. (A. Guirgis.)

1. Vessels. 2. Vacuolated fibrous tissue. 3. Muscular tissue.

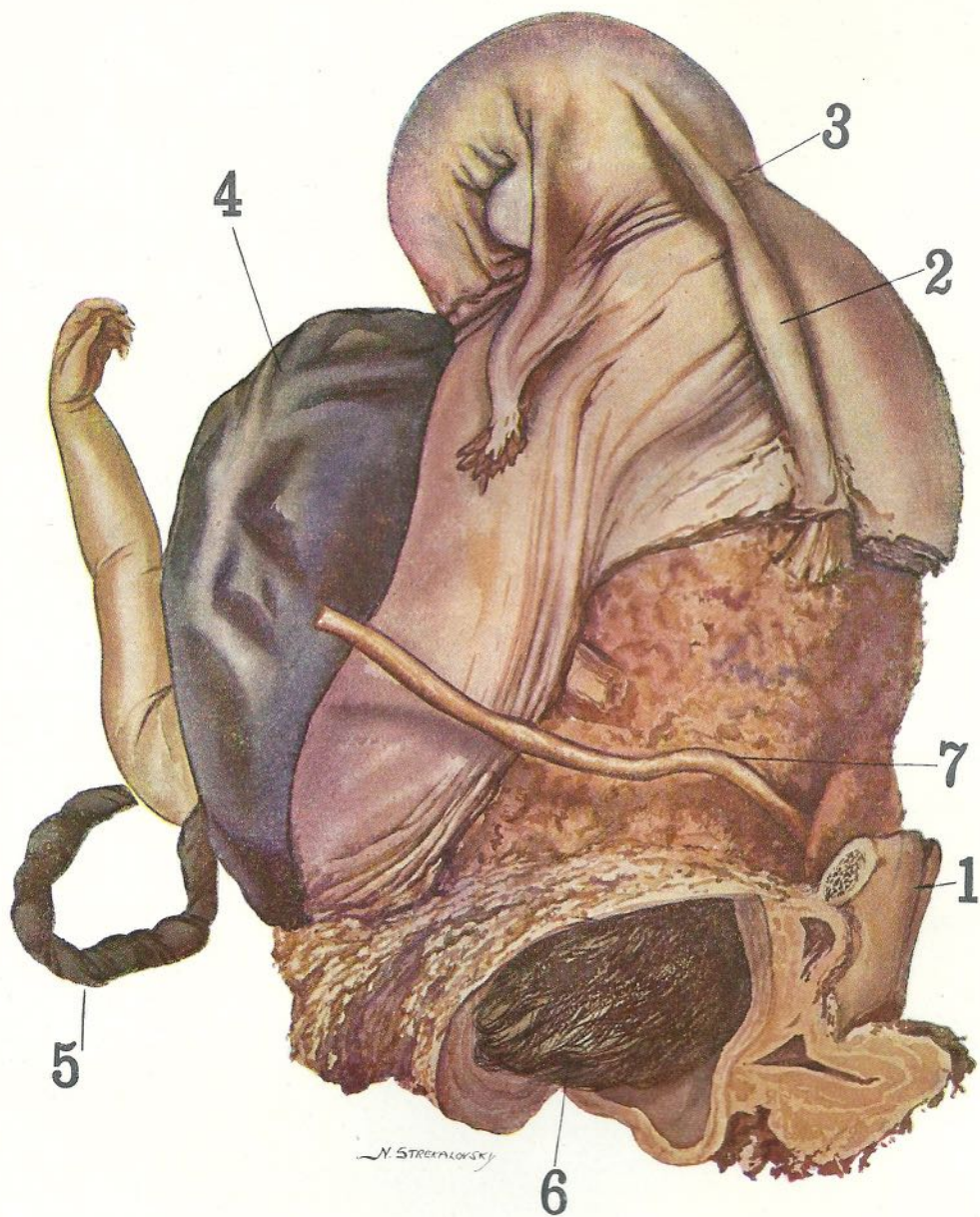


FIG. 5

Anatomical relations of the ureters to the bony pelvis in a case in which rupture of the uterus occurred as a result of obstructed delivery.

(Specimen 151)

The specimen was removed post-mortem from a patient who died as a result of difficult labour. The child presented by the head, but owing to pelvic contraction natural delivery was impossible. The lower uterine segment is seen to be greatly distended. The contracted upper uterine segment lies completely above the buttocks. The foetus, in other words, is entirely surrounded by the distended vagina and lower uterine segment.

A vertical tear is seen in the left postero lateral side. The placenta was partially extruded into the peritoneal cavity through this rent. The shoulder and arm of the foetus filled the rent and prevented the occurrence of any appreciable intra-peritoneal haemorrhage.

The trigone of the bladder with the ureteric openings were in the direct plane of compression.

1. Symphysis pubis. 2. Round ligament of uterus. 3. Retraction ring. 4. Placenta. 5. Umbilical cord.
6. Foetal head. 7. Ureter.

incisions at either side or one upwards towards the cervix and one downwards towards the meatus may, in some cases, be of use in finding the line of cleavage and may render dissection of the flaps easier. I do not remove a ring of vaginal or bladder wall. This practice is absolutely unnecessary and will, if applied as a routine, jeopardize the chances of cure if the operation has to be repeated. Before closing the bladder I assure myself that there are no stones inside it. For suturing the bladder walls I use No. 0 or No. 1 chromic catgut. The sutures should pass through the muscular wall of the bladder including a good bite of tissue but should neither perforate the wall nor include the bladder mucous membrane. The sutures are passed with small well-curved round-bodied needles and must be introduced with the greatest care and should emerge just at the edge of the mucous membrane of the bladder. If this is done you will ensure a clean straight line inside the bladder when the sutures are tied. The lateral sutures should be passed first. This will help in visualizing a ureteric opening that may be lying near the edge. If one is discovered the wall of the ureter should be dissected from the surrounding connective tissue for a short distance. The suture in such a case should be passed first in the muscular wall of the anterior flap of the bladder and then in the anterior wall of the ureter at a short distance from the orifice and lastly in the muscular wall of the posterior bladder flap. When a suture placed in this manner is tied the ureteric opening will look inwards towards the bladder cavity and the ureteric wall will be neither occluded nor compressed. When all the bladder sutures have been tied we should test the impermeability of the bladder by filling it with a coloured solution. If leakage occurs I presume that there is a fault with the suturing or that a tiny fistula may be lying embedded in scar tissue to which I should attend. Haemostasis should be perfect. The vaginal flaps should be sutured in whatever plane will cause less tension on the flaps when the sutures are tied. Here and there a suture may be made to catch the underlying bladder in order to prevent any dead space. I habitually use silkworm gut for the vaginal sutures. In some of my later cases I employed No. 1, 30

days, chromic catgut or nylon sutures and found them reliable.

After closure of the vaginal flaps I wash the bladder cavity again and leave a catheter tied in the urethra for 10–12 days. With the introduction of the sulphur compounds and antibiotics and the use of a buchu and hyoscyamus mixture during convalescence we have ceased to get blockage of the catheter by deposition of salts inside or around it. During convalescence the patients are at liberty to lie on their backs or sides. We allow them free movement in bed. It is immaterial whether a suction apparatus is or is not used. We remove the sutures on the 17th day. If they are left longer they will cut through the mucous membrane of the vagina and the knots may become embedded. In removing such a knot, we pull on one end of the suture only. The knot will then become visible. In cutting the knot care should be taken not to cut both sides of the suture above the knot. If we do a piece of silkworm will be left behind, nor should we cut the two sides of the suture below the knot and leave the knot behind, else it will cause trouble to the patient and to her husband who may sue the surgeon for damages. Before discharge from the hospital the patient is instructed to avoid marital relations for 2 months.

Several modifications of the flap splitting operation have to be occasionally adopted in order to suit particular cases but the principle is always the same.

In a type of fistula we sometimes meet with in Egypt, the trigone and the neck of the bladder, as well as the upper third of the urethra, are entirely destroyed. The remaining part of the urethra is blocked, and is separated from the bladder by dense scar tissue. Such cases offer great technical difficulties and indeed were considered inoperable. I have, however, been able to cure most of them by the technique shown in Figures 6, 7 and 8. I begin the operation by perforating the blind end of the urethra, I then liberate its wall by careful dissection from the surrounding tissues. I next remove the scar tissue that intervenes between the urethra and the opening in the bladder. The next step is to mobilize the bladder by dissection which in some cases has to be carried as far as the peritoneum. When that is done I suture the edges of the

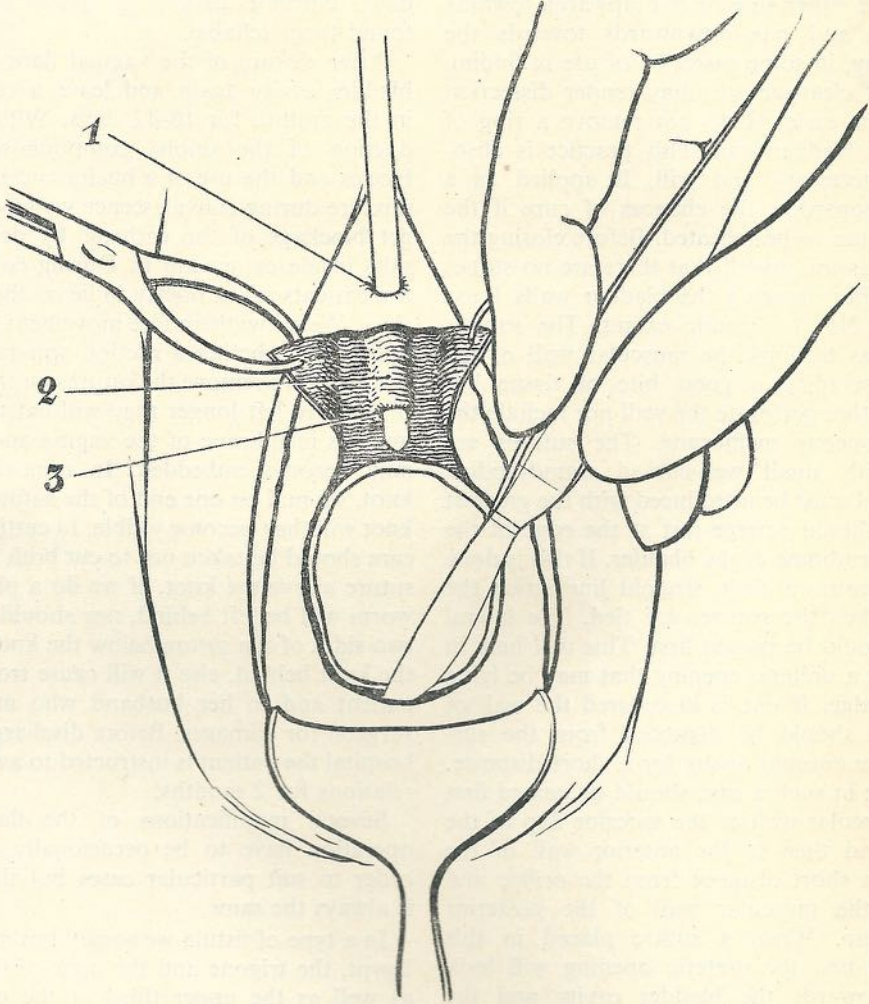


FIG. 6

Vesico-urethral anastomosis.

First step. The scar tissue has been removed.

1. Probe placed in urethra. 2. Denuded wall of urethra. 3. Tip of probe.

bladder together, leaving a small gap in the centre which I use in making an anastomosis between the bladder and urethra.

Another type of fistula which I sometimes meet with is the "vesico-isthmial" the so-called vesico-uterine. In dealing with this type I make a transverse incision in the vault of vagina and dissect the bladder off the cervix. When I reach the level of the fistula I stop dissection and divide the cervix in the middle line up to the site

of the fistula. I find that this greatly facilitates further dissection and suturing of the flaps.

Another rare type of fistulae is the uretero-vaginal. The treatment of this type depends upon the amount of scarring present at the vault. If that is not great I begin by dissecting the ureter vaginally for a short distance. If that has been satisfactorily completed I dissect the vaginal wall off the bladder and mobilize it to the extent I find necessary to approximate it to

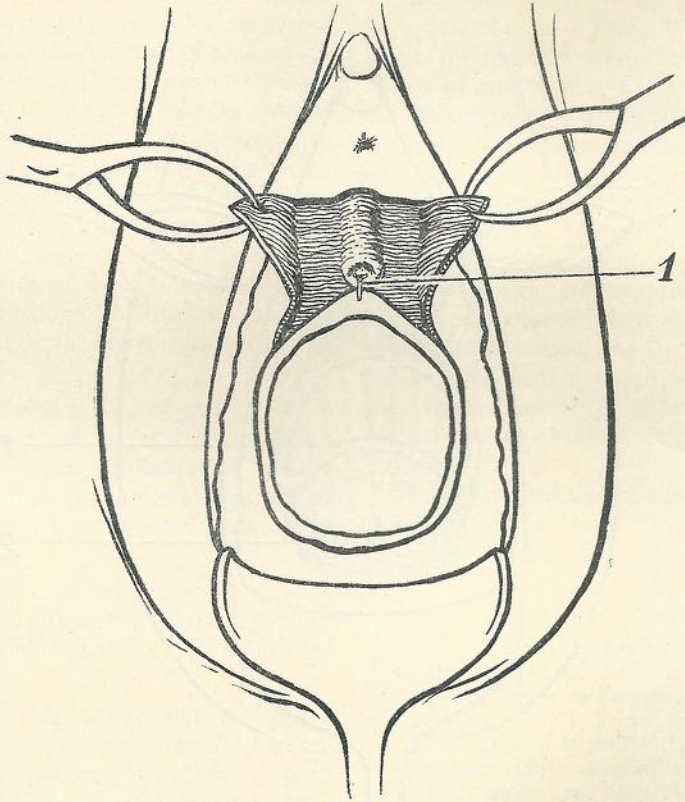


FIG. 7

## Vesico-urethral anastomosis.

Second step. The upper wall of the bladder is dissected out and sutured to the roof of the urethra.

1. Suture uniting urethra with bladder.

the ureter without tension. I then implant the ureter in the bladder through an opening which I make for the purpose. I do not use ureteral catheters. I have done this successfully in 10 cases. In 4 other cases I failed to make the implantation to my satisfaction and had to adopt the abdominal route. After all successful operations on fistulae the patient gets complete control over micturition irrespective of the site or the size of the fistula, except in the fistulae in which the trigone and neck of bladder have been destroyed. A certain number of these patients will have continence while lying down but the moment they get up the urine begins to dribble, in spite of the fact that the bladder neck had been buttressed with all available tissue and to

all appearances the fistula was successfully closed.

To remedy this defect the sling operations which were devised for the cure of stress incontinence have been adopted. Foremost amongst these is Aldridge's (1942) modification of the Goebell Stockel technique. In this operation strips of fascia of the oblique muscles of the anterior abdominal wall are made and pulled down by a forceps pushed through an incision made in the vagina. The strips are then sutured under the urethra so as to form a sort of supporting sling. The results are not always satisfactory on account of the difficulty in deciding upon the amount of tension necessary to support the urethra. It is sometimes too much and sometimes too little.

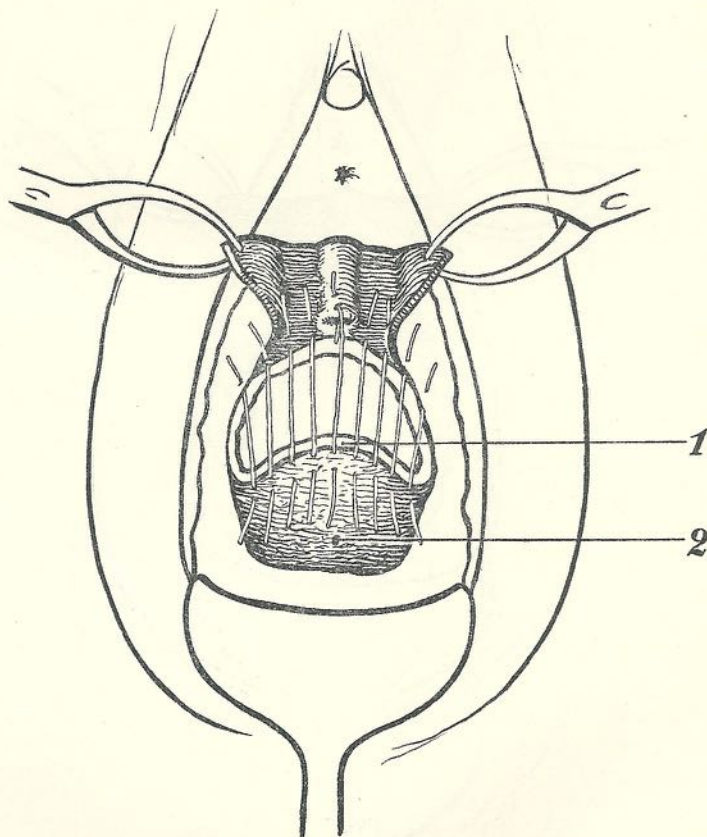


FIG. 8

## Vesico-urethral anastomosis.

Third step. The lower vesical and lower urethral flaps sutured.

1. Edge of demobilized bladder. 2. Raw surface of demobilized bladder.

Millin and Read's (1950) technique has a better prospect of success and has the advantage over Aldridge's in that it does not open the vagina. Through a transverse abdominal incision the aponeurosis is exposed. Two strips each 1 cm. wide and 15-18 cm. long are cut from the aponeurosis of the external oblique, one on each side. The recti muscles are separated in the middle line and the retro-pubic space opened up. The bladder neck is identified and a tunnel is made behind the urethra. The strips are threaded through the outer borders of the recti on each side, then through the tunnel and then through the mid-rectus on each side, and sutured to each other by nylon sutures. Sling operations in general can only be adopted for

the cure of incontinence following operations on fistulae of the trigone in the cases in which there is a reasonable chance of dissecting the neck of the bladder off the vaginal wall without subjecting the bladder and urethra to serious damage. It is of fundamental importance to choose the right case before attempting the operation.

We now come to the most troublesome type of all; the case in which the whole urethra has sloughed away. For the treatment of this condition Kelly suggested making a tunnel under the vestibule and drawing through it a long flap dissected from the anterior vaginal wall. Farrar improved this technique by dissecting a wider flap and converting it into a tube.

I have done these operations several times but I seldom effected a cure. A better procedure for the cure of such cases is Couvelaire's technique which was revived by Read. The operation is begun by making a preliminary cystotomy, then the fistula including the part of the urethra that may be present is completely mobilized and closed in 3 layers. A neo-urethra is constructed. After 3 weeks a special curved trocar is passed along it and the trigone is punctured. A catheter is directed through it into the bladder and left *in situ* until the cystotomy wound is closed.

Finally there remains a type of case in which hopeless destruction of vaginal tissues has occurred. In such cases implantation of the ureters into the sigmoid is advised. This operation, though easy to perform, has great disadvantages.

The operation is a serious procedure causing an anatomical change which imposes upon the bowel the additional function of a urinary reservoir.

As a result of this adjustment the upper urinary tract can be adversely affected. Ascending infection from the bowel occurs in most cases and usually leads to pyonephrosis. In a large number of cases biochemical disturbances occur owing to re-absorption of chlorides, urea and acids from the bowel. According to Ferris and Odel (1950) about 80 per cent of 141 patients who had both ureters transplanted developed acidosis with a high serum chloride and low bicarbonate concentration. Affected patients suffered from great thirst, and anorexia. There was a salty taste in the mouth, and the stools were large and watery. In many patients continual rectal drainage with a tube became necessary.

In order to evade the hazards and complications of transplanting the ureters into the colon C. Wells of Liverpool advised an alternative procedure in 1953. It consists of transplanting the ureters into an ileal loop isolated from the intestines and brought to the skin surface where the urine is collected in an ileostomy bag. This procedure was adopted by him with success in 9 cases of cystectomy for cancer of bladder.

## RESULTS

At the present day the cure of a mobile fistula of moderate size is an operation that can be successfully performed by gynaecological surgeons who have had experience in vaginal surgery. Immobile fistulae of the vault and fistulae tethered to the pelvic walls as well as urethral fistulae involving the neck of the bladder demand great experience in plastic vaginal surgery. In my early cases the failures were more common than the successes. I sometimes had to repeat the operation 3 or 4 times before I effected a cure. In my last 300 cases the results were invariably successful and almost always obtained at the first shot.

The figures illustrating the lecture are from the *Atlas of Mahfouz's Obstetric and Gynaecological Museum*, Volume Two, John Sherratt and Son, 1949.

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