

9 MANAGEMENT OF POST-REPAIR INCONTINENCE

Introduction

It is one thing to be able to close a vesico-vaginal fistula, but it is another matter to make patients continent. We can close over 90% of cases, but another 20% at least will have some incontinence, and in about half it is so bad that the patient is still totally wet. This ‘incontinence gap’ is a source of great frustration to fistula surgeons. Its cause is not hard to see.

The mid-urethra may be more important than the urethro-vesical junction in maintaining continence. In our series, 35% of patients have a fistula less than 2.5 cm from the external urethral orifice (i.e. one involving the mid-urethra) and 60% have a fistula within 4 cm of the orifice (i.e. involving the urethro-vesical junction). In addition to being shortened, the urethra may be denervated, fibrosed and functionless.

Bladder function may be disturbed in several ways. The bladder size can range from normal to severely reduced. Its compliance can vary, ranging from being atonic with chronic retention and overflow to unstable with frequent abnormal pressure waves (detrusor instability, leading to urge incontinence). If these variables could be identified by urodynamic testing they could help us with management. Our studies in fistula patients are in their infancy.

Andrew Browning has developed a special interest in the management of stress, and this chapter will focus on his preferred operative procedure and management. This is a combination of urethral and bladder neck plication and the use of a fibromuscular sling. Other surgeons have different approaches, and, although we have limited experience of these, they will be briefly discussed later in the chapter.

The management of post-repair stress incontinence falls under four headings:

- immediate assessment
- conservative measures
- surgical management
- management with a urethral plug.

Immediate assessment

Frequency and poor control are common just after catheter removal, but often improve rapidly. If the patient is still wet after 48 hours, and assuming that a dye test

has excluded a breakdown, she needs to be categorized into one of four degrees of severity:

- *Wet with exertion (coughing or effort).* This often improves over time with pelvic floor exercises.
- *Wet on walking, dry on sitting and lying, but can void well.* Again, this can often improve with time and pelvic floor exercises.
- *Wet on walking, sitting and lying, but still able to void to some extent.* This does not often improve with time, and the patient will either need assistance with a urethral plug or a secondary stress operation, usually after 6 months of trial of pelvic floor exercises.
- *Wet all the time, not voiding.* This rarely improves with time. It is often due to a very small bladder and/or a functionless urethra. A urethral plug may be of benefit if the urethra is not too lax. Over time, intermittent occlusion of the urethra may help to expand the bladder, and a secondary stress procedure can then help. Patients who do well with the plug usually do well with a secondary stress operation.

Conservative management – pelvic floor exercises

In developed countries, there is objective evidence that pelvic floor exercises are of value in the management of stress incontinence. But the benefit has only been shown in motivated patients who have had proper instruction from a professional.

Great importance has been placed in the instruction of fistula patients in pelvic floor exercises. Unfortunately, the women with the worst stress incontinence are those who have ischaemic damage to the pelvic floor muscles. One has only to put two fingers in the vagina, and feel the fibrosis in the vagina and levator muscles and ask the patient to squeeze, to realize how little contraction there is.

Other patients with stress but with less damage will benefit from instruction – but only if this is done properly (Figure 9.1). It is essential to put two fingers in the vagina to help the patient to understand what to do and to check on progress. Simple verbal instruction is doomed to failure. The patient should also be taught to examine herself for feedback.

The routine taught at the Addis Ababa Fistula Hospital is for the patient to tighten her pelvic floor as strongly as possible for 5–10 seconds. She should continue to breathe normally. The squeeze is then repeated 10–20 times, with gaps of 10 seconds between. The patient should repeat this routine three times a day.

A happy event is that we sometimes see patients going home with moderate stress, but returning later to tell us that the incontinence has cleared up spontaneously after a few weeks.



Figure 9.1 Teaching pelvic floor exercises at the Addis Ababa Fistula Hospital.

Surgical management

At least 6 months should pass to allow time for spontaneous improvement. A secondary stress incontinence procedure can then be considered. First, the diagnosis must be confirmed and a dye test performed again. *It is very easy to overlook a tiny residual fistula.* The test should be done in theatre at the start of any proposed stress operation. If it is negative, incontinence can be demonstrated by removing the catheter with the dye still inside it: often, the dye just gushes out – if it does not, the patient should be asked to cough, whereupon incontinence is usually readily appreciated.

Until recently a simple cystometry was performed to aid selection. The bladder was filled with water through an open bladder syringe held vertically while compressing the urethra. If the bladder pressure was estimated to be more than 20 cmH₂O with only 100 cm³ in the bladder, operation was not recommended. This excluded about one-third of patients. Now, all patients are given a chance with the plication and sling, and the success rate (around two-thirds) has decreased only slightly.

Urethral plication with a fibro-muscular sling

The aim of the surgery is to lengthen and narrow the urethra and then provide support with a fibro-muscular sling (the sling is described and illustrated in Chapter 6).

Position the patient as for a fistula repair, and use an episiotomy if necessary. First, measure the length of the urethra as follows: insert a Foley catheter; inflate the balloon; pull the catheter until the balloon abuts the bladder neck; pinch the catheter at the level of the external urethral meatus; deflate the balloon; remove the Foley while still pinching it; re-inflate the balloon. The urethral length is from where the Foley is pinched to the balloon (Figure 9.2a). In Ethiopia, the average length before operation is 1.4 cm, which is less than half the normal length. Almost all patients will have a shortened urethra.

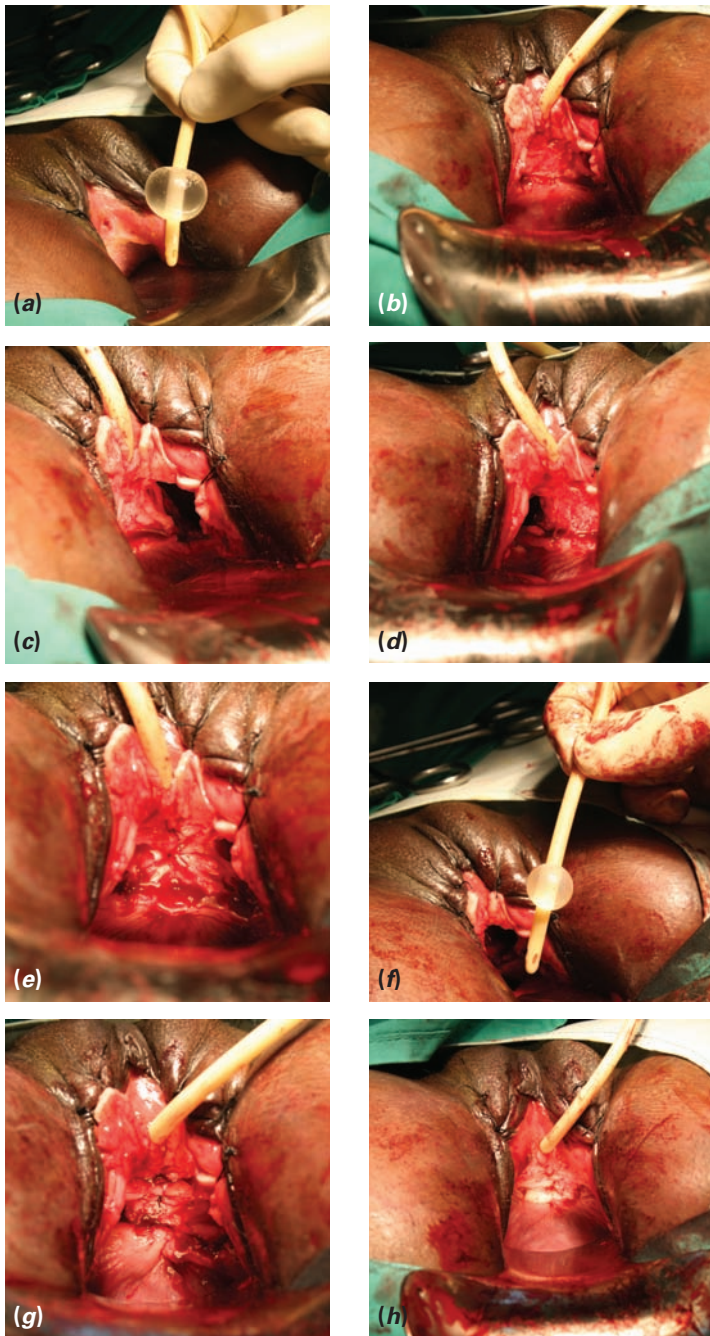


Figure 9.2 Urethral plication with a fibro-muscular sling. (a) The urethral length is 1.5 cm. (b) The vaginal flaps are elevated. (c) The right para-vesical space is opened. (d) The left para-vesical space is opened. (e) Plication has been completed. (f) The urethral length is now 3 cm. (g) The fibro-muscular sling is made over the plicated urethra. (h) The vaginal incision is closed.

Next, reflect the vagina mucosa. Make a vertical incision through the vagina along the urethra, with a metal catheter in situ, beginning just proximal to the external urethral meatus. This incision should be the length that you would like the urethra to be: about 3–4 cm. Make the incision into an inverted ‘T’ incision, with the arms of the ‘T’ extending onto the lateral vaginal walls. Reflect these flaps either side, and suture them out of the way to the labia majora (Figure 9.2b). Dissect a little under the horizontal incision to mobilize the distal bladder. With scissors, dissect the urethra and bladder off from the lateral attachments, opening the para-vesical space on either side (Figure 9.2c, d).

Great care should be taken, as it is easy to open the bladder here and create another fistula. If this happens, it is usually because the first operation was for a circumferential fistula that was not repaired in a circumferential manner. Re-repair is extremely difficult, but must be attempted.

The next step is to plicate the urethra and distal bladder with three or four interrupted sutures in the midline. These aim to pick up the pubo-cervical fascia, or at least its remnants, to narrow the urethra and pull the walls of the distal bladder together. This has the effect of producing a lumen inside that will have its diameter narrowed to resemble that of the urethra (Figure 9.2e).

Measure the length of the urethra again to see if it has lengthened. The average length of the urethra had doubled to 3 cm in the Ethiopia series of 72 consecutive cases (Figure 9.2f).

Perform a dye test to ensure that the bladder has not been opened accidentally.

Make a sling by grasping the fibro-muscular tissue on each side, developing a block of tissue to be sutured together in the midline (Figure 9.2g). Of course, a sling may have been made at the primary operation, but additional tissue can usually be found to make another one. Note that there may be brisk bleeding as the pedicle is elevated. This can be a source of postoperative bleeding if it is not carefully attended to.

The vagina is now repaired (Figure 9.2h). Take a deep bite though the lateral vaginal incision to include the bed of the pedicle. This reduces any dead space and bleeding.

The Foley catheter is left on free drainage for 3 days, and the patient is encouraged to drink as usual. After removal of the catheter, the patient is encouraged to void every 2 hours. After 2 days, the residual urine after voiding should be measured. It should be less than 100 cm³. If it is not, the patient is deemed to have urinary retention, which needs treatment – see below. The patient is also shown how to perform pelvic floor exercises. The patient is assessed, and any remaining stress is quantified into the scale referred to previously so see if there has been any improvement from before the operation.

Complications

Complications of this procedure include:

- accidental re-opening of the fistula in about 5% of cases
- ligation of ureters if the sutures have been placed too deep (this has not been recognized in our experience)
- retention of urine in 15% of cases.

Management of retention

A few patients cannot pass urine at all and must have the catheter re-inserted; others have a degree of retention that, if undetected, could lead to overflow incontinence, urinary tract infection and even stone formation.

All patients should have their residual urine measured before being allowed home. If it is more than 100 cm³, proceed as follows:

- Replace the catheter, and repeat the measurement in 48 hours.
- If the residual urine is still more than 100 cm³, teach the patient double voiding. In this, the patient voids as normal, perhaps with supra-pubic pressure – pushing on this area with her hand. She then stands up and walks around for a few moments while the bladder ‘readjusts’ to having a smaller volume of urine in it, and then she tries to void again.
- If this does not fix the problem after another 48 hours, teach her clean intermittent self-catheterization. She should try to void as much as she can and then pass a short stiff catheter into her bladder to drain the remaining urine. She washes the catheter and keeps it clean to use the next time. Most patients will improve in time, although there may be a small group in whom the bladder never regains the capacity to empty, so self-catheterization may be for life. In this case, the patient should be provided with a metal catheter.

We have heard from one surgeon that the incidence of retention will be reduced if the catheter is left in for 10 days post operation rather than 3 days as we practise. This requires further investigation.

Results

These have been promising in the short term.¹ Two-thirds of patients went home dry. This includes a few who needed to be taught self-catheterization for retention. Of the remaining one-third, half were improved (from being wet all the time to wet only with coughing or wet on walking), and some of the others gained benefit from using a urethral plug.

My experience with only 24 operations of plication and sling is not quite as good as that of Andrew Browning. In a few patients, I cannot find any tissue for a sling, so just do a plication. Sometimes, this is barely possible because of fibrosis. It is difficult for a visiting surgeon to know his results compared with a resident one. Approximately half of my patients are reported as dry after catheter removal, and I

have not been aware of retention as a problem – but this could well have been overlooked. I have only once re-opened a fistula. It is possible that I have not been radical enough in performing the plication and sling. I still use this as my first choice for severe stress, as the operation is relatively easy to do and does not preclude other procedures such as fascial slings later.

The procedure clearly shows promise, but time will tell if others can reproduce Andrew Browning's very encouraging results.

Other stress procedures

Ideally, urodynamic assessment should both help us to understand the cause and help in selection of surgery. It was available at the Addis Ababa Fistula Hospital to Carey and colleagues when they first introduced the rectus fascial sling there.²

A random group of incontinent patients were assessed urodynamically. Only 41% were found to have genuine stress incontinence with a compliant bladder. A similar percentage were found to have detrusor instability as well, which was thought to be a contraindication to surgery; the remainder had either a very small bladder or retention with overflow. Only the first group had the operation. Of these, 78% were dry on discharge, although some relapses were seen later.

Good urodynamic facilities continue to be used at the Addis Ababa Fistula Hospital to select patients for the rectus fascial sling, which is the preferred operative method there. At present, only patients with a bladder capacity of 200 cm³ or more are accepted. About 70% of patients with serious stress fulfil these criteria. Small capacity of the bladder rather than bladder wall instability appears the main contraindication in the other 30%; they are managed with urethral plugs where possible. In the hands of one surgeon who specializes in this procedure, at least 40% of these selected cases appear cured and another 40% considerably improved. Publication of the results of these urodynamic studies and the surgical outcomes is anxiously awaited.

For the vast majority of surgeons working without urodynamic facilities, some simple observations can be made that may help in selection. We are indebted to David Lyth working at the Aberdeen Clinic and Fistula Centre in Freetown, Sierra Leone, for the following suggestions. First, patients can be asked to wear pads for 24 hours to get an idea of the amount of wetness, and any urine voided in that time should be measured. Residual urine should be measured in the un-anaesthetized patient, and the bladder capacity is measured by gradually filling the bladder through an open syringe held 20 cm above the level of the bladder. Provided that there was no pre-existing retention, a good bladder capacity (250 cm³) is a favourable sign. The catheter is removed, leaving the fluid inside. If it then squirts out, this suggests an unstable bladder – a predictor of a poorer operative outcome. On the other hand, those patients in whom there is leakage only on coughing should do better. The best prognostic sign for a successful rectus sling operation is a good result using a urethral plug.

We have little personal experience of this operation. The principle is illustrated in Figure 9.3. A strip of rectus fascia is taken via a supra-pubic incision and passed under the urethra. The dissection is started under the mid-urethra, passing laterally on each side into the retro-pubic space. Forceps are passed behind the pubis, pressing hard against bone to minimize the risk of opening the bladder, until the rectus sheath is reached. Strong sutures attached to each end of the fascial strip are used to manoeuvre the sling through this tunnel and under the urethra. It is then sutured to the rectus sheath just above the pubis. There is general agreement that the sling should be pulled up more tightly than one would for patients in developed countries. A guide is that it should be tight enough for a 14 Fr catheter to encounter significant resistance. Over-tightening may predispose to retention, but patients may prefer to self-catheterize than be wet.

There are many ways of performing the operation that are described in standard operative textbooks of urology or gynaecology, but it should be appreciated that in patients in developed countries the urethra is substantially intact, whereas in fistula patients requiring surgery it is usually short, surrounded by fibrosis and functionless. Methods applicable to fistula patients are described by Judith Goh and Hannah Krause in their book³ and by Michael Breen in his lecture notes.⁴

Kees Waaldijk, who has vast experience of fistula surgery in Northern Nigeria, has evolved his own operation for stress incontinence, which has been used in over 500 cases. This involves a radical plication of urethra and bladder base – even more so than in Andrew Browning's operation. A form of colpo-suspension is then performed in which the bladder base is hitched up, using the remaining pubo-cervical fascia, to the arcus tendinus region on the pelvic side wall. All this is done from below through the widely opened para-vesical space, using an aneurysm needle

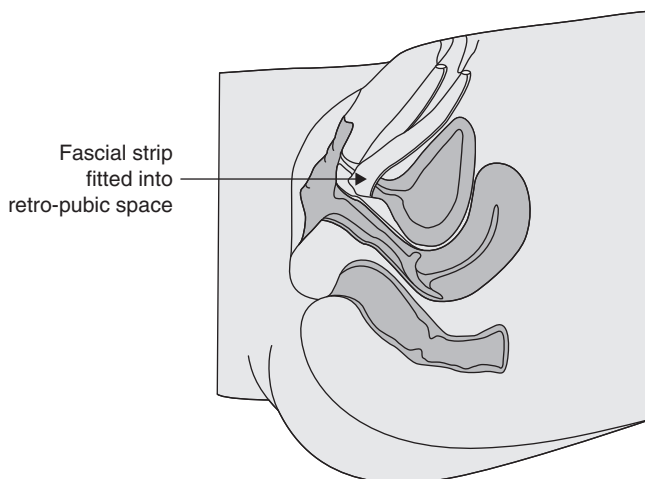


Figure 9.3 Rectus fascial sling in position.

for access. This has worked well for Waaldijk, with up to 60% of selected patients being completely dry. However, this method has not been widely used by others.

Finally, it should be mentioned that some enthusiastic visiting surgeons have performed tension-free tape operations on selected patients. The trans-obturator method has been favoured because such good results are reported in non-fistula patients. However, our fistula patients are young, usually with scarred, rigid, shortened urethras – quite different from patients in developed countries. It is not surprising that several unsatisfactory results have occurred, with a serious risk of later erosion of the tape. We see no place for its use on a casual basis.

Only a few surgeons are regularly operating for stress incontinence. Clearly, the problem of post-repair incontinence is a major one, and there is an urgent need for full-time fistula surgeons to report selection criteria and results – both good and bad. Whatever procedure is adopted, it is probably only the full-time fistula surgeons who take an interest in this problem who will achieve good results. At present, in the best hands, only 50% of patients who are wet post-repair can be made dry, and we know nothing of long-term results. Improvements may come when we learn how to select patients better by simple observation and measurements and can define the best surgical procedures.

Urethral plug

The urethral plug is a small, simple device that, as the name suggests, merely plugs the urethra to stop urine draining out (Figure 9.4). It can be used for any patient who is still severely bothered by her incontinence.



Figure 9.4 (a) Urethral plug. (b) Insertion of the urethral plug. The patient is watching with a mirror. (c) The plug in position.

There are a few patients in whom plugs will not work. These are usually patients with very small bladders or very wide urethras.

The plug is inserted into the urethra with the aid of an introducer. The patient should be able to do this quite easily herself after a few lessons. She may be helped by using a small hand-held mirror. The introducer is removed after insertion and kept in a safe place. When she feels urine in the bladder or urine starts to leak around the plug, often signalling a full bladder, the introducer is put back inside the plug to allow its withdrawal.

With increasing experience of plugs, Andrew Browning has seen some patients in whom there has been a demonstrable increase in bladder size over time and who have stopped using the plug because they are continent.

Some risks are involved with use of urethral plugs, namely infection and trauma to the urethra causing bleeding and pain. To minimize these, the patient is told to use the plug for only 12 hours a day – either all night or all day, but not both.

There have also been reports of plugs being lost in the bladder. Where an operating cystoscope was not available, the plug had to be removed by open cystotomy.

The plug is meant to be a single-use device, but, owing to its cost, this is clearly not possible in the developing world. The patient is taught to clean it with soap once a day and to wash it after each application, along with increasing the amount of fluid that she drinks. This reduces the chance of infection, and one plug can last up to about a month with this regime. The patient can return for follow-up and assessment if she needs more plugs.

Urethral plugs have a role to play in the management of intractable incontinence, but can be safely used only in the setting of a permanent fistula unit. Plugs are used at the Addis Ababa Fistula Hospital and its satellite centres and the Aberdeen Clinic and Fistula Centre in Freetown. Further studies from these centres on longer-term use of plugs are awaited with interest.

References

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3. Goh J, Krause H. *Female Genital Tract Fistula*. Brisbane: University of Queensland Press, 2004.
4. Breen M. *Teaching Notes for Obstetric Fistula Repair*. CD, available from Michael Breen, Monze Hospital, PO Box 660029, Monze, Zambia (mbreen@zamnet.zm).