

CHAPTER 11

POST-OPERATIVE CARE AND COMPLICATIONS OF FISTULA REPAIR

Section 11.1: Routine post-operative care
Section 11.2: Complications and mortality in fistula surgery

(11.1) ROUTINE POST-OPERATIVE CARE

Post-operative care can be summarized by the three D's:

- (1) Drinking: Check that the patient is drinking plenty of fluids.
- (2) Draining: Check that the catheters are draining.
- (3) Dry: Check that the bed is dry.

(1) (DRINKING) FLUID INTAKE

- Give up to 3-4 litres of intravenous fluids in the first 24 hours post-operatively, as the patient is unlikely to be drinking well at this stage. Proper fluid intake will ensure a good flow of clear urine at all times and help prevent clot formation and catheter obstruction.
- Start oral fluids on the first post-operative day, or earlier if tolerated. In some units, oral fluids are tried after 4 hours although vomiting is common.

(2) (DRAINING) URINARY DRAINAGE VIA FOLEY CATHETER

Make sure the Foley catheter is above her leg (and not kinked) and is not running underneath it to avoid the weight of her leg blocking it. The Foley catheter can connect to either:

- *Closed system:* Drain into a collection bag. There is a risk that the tubing may kink or twist so make sure the bag is placed on a chair below the level of the bed. If the bag is left on the floor, it may get kinked and blocked. The bag should be at a lower level than the bladder to drain well. It is better not to tie the bag to anything (including the bed) as this may pull on the catheter when the patient turns in the bed. However, another option is to make a urine bag holder from metal wire and hang it on the bedside.
- *Open system:* The catheter can be connected to an intravenous giving/ tubing set or any plastic tubing and drain directly into a bucket or basin. Alternatively, some units use the usual urine bags but just cut the bag off and use the tubing. The advantages of this method are:
 - The flow (drop by drop) of urine can be observed by the patient, relatives and staff so blockage is easily recognized.
 - There is no danger of urine bags not being emptied and getting over-full.
- *Mixed system:* In this case, the closed system is used, but the drainage valve at the bottom of the bag is opened at night time so that the urine drains into a bucket. In this way, there should be no risk of the bag becoming over-full during the night when everybody is asleep. The patient can then close the drainage valve at bottom of the bag in the morning.

Causes of a blocked Foley catheter

Blockage of the Foley catheter can occur secondary to: (a) Blood: haematuria is more persistent following abdominal surgery than vaginal procedures. (b) Crystals/ debris even if the urine appears clear. This is much more likely if the urine is concentrated. (c) Purulent (infected) urine. (d) Twisting or kinking of catheter. To prevent blockage, instruct the patient to drink 4 litres per day to keep the urine output at 2-3 litres/ day.

- If most of the urine is draining through the ureteric catheters and very little through the Foley catheter, pull the ureteric catheters back 1 cm to encourage more to drain via the Foley so that the Foley stays patent.
- If the Foley catheter falls out on the ward with the balloon deflated, it is better to reinsert a new catheter. If not readily available, at least test the balloon of the (old) catheter before re-inserting as it may have been pricked by a needle during the repair.

	<p>If no urine is flowing, first consider a blocked catheter.</p> <ul style="list-style-type: none"> ➤ The catheter should be irrigated with 10-20 ml of saline or distilled water. ➤ If irrigation fails to unblock a catheter, then change the catheter, preferably in the operating room in lithotomy position. <p></p> <p>The patient and her relatives should be warned to report if either of these occur:</p> <ul style="list-style-type: none"> ➤ The catheter stops draining. This is easier to see if open drainage is used. <li style="text-align: center;">or ➤ If the patient experiences suprapubic pain.
<p></p> <p>When flushing the catheter, fluid must go in and come out. This is because sometimes the catheter is blocked by a blood clot near the tip of the catheter. This can have a valve effect i.e. it lets fluid in but does not let it flow out.</p>	

Management of the ureteric catheters

The ureteric catheters (if present) are left in for various times to allow any ureteric/ meatal oedema to subside. However, tubes are also foreign bodies and increase the risk of pyelonephritis so should be removed as soon as possible. If the ureters are:

- Well away from the fistula repair: take out catheters at end of operation, if used at all.
- 1-2 cm from the fistula edge: leave catheter in for 5 days.
- < 1 cm i.e. close to fistula edge: leave catheter in for 7 days.
- Re-implanted or wrapped in or if this is the only functioning kidney: leave catheter in for 10- 14 days.

	<p>It is important not to remove the ureteric catheters too early. I know of several cases where the surgeon removed the catheters at the end of the operation only to have to take the patient back for re-operation due to anuria.</p>
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- If there is no urine draining from the ureteric catheters, then they should be flushed with 1-2 ml water (injected via a needle). If the fluid will not go in, withdraw the catheter slightly in case it is against renal tissue. If no urine continues to flow through the catheter, remember that the urine often drains around the catheter rather than down it so you do not need to be too concerned.
- Because of the risk of pyelonephritis, some surgeons keep the patient on a prophylactic antibiotic while the ureteric catheters are in place e.g. oral ciprofloxacin.

CAUSES OF ANURIA

If urine is not draining from the Foley or ureteric catheters:

- *Pre-renal:* Not getting enough fluids.
- *Renal:* Renal failure is a possibility. This can be secondary to sepsis originating from the site of surgery.
- *Post-renal:*
 - (a) *Ureter:* If no urine flows post-operatively, suspect that both ureters have been obstructed.
 - (b) *Bladder:* There may be a hole in the bladder that was not repaired and urine may be leaking intra-peritoneally (this is very rare) or into the vagina (failed fistula repair).
 - (c) *Urethra:* The catheter may be blocked.
 - (d) The drainage tube might be the site of a blockage, especially if it is attached to a bag and it is kinked where the tube enters the urine bag.

Case History: A patient failed to pass urine post-operatively. The surgeon undid the repair vaginally and repaired it six months later. A better alternative, if you can catheterize both ureters, would be to re-do the repair immediately. The problem with leaving the fistula open after having done all the dissection is that it may create more scarring and tissue distortion.

Case History: A patient was noted not to be passing urine on day 2 post-operatively. The records were unclear if she had been passing urine on day 1. She was febrile. When taken back to theatre, the repair was opened up and purulent material poured out. She made a good recovery as the anuria was secondary to sepsis. The VVF was repaired about 6 months later.

Diagnosis and management of the causes of anuria

Step 1 (Post-renal):

- Flush the Foley catheter with 10 ml; this may help to dislodge blood clot. If fluid fails to go in or fluid goes in but does not come out, change the catheter.
- Make sure the tubing is not kinked.
- Reduce any pressure in the bladder by removing the vaginal pack and deflating the Foley balloon (partially or fully).
- Do ultrasound of kidneys: hydronephrosis develops within hours if there is complete obstruction.

Step 2 (Pre-renal) = Give a fluid challenge of 500 –1000 ml. Exclude shock.

Step 3 (Renal) = Give frusemide 10-20 mg IV. May also give 200 ml of 20% mannitol.

Step 4 = If anuria persists for more than 24 hours, the options are to:

- Take back to theatre and open the repair. Usually, the urine starts flowing immediately. If it does not, give frusemide or mannitol before you decide that you have done the wrong procedure!
- Re-implant both ureters abdominally if the bladder is large enough.
- Perform bilateral nephrostomies. In cases where there is no permanent obstruction, as the swelling settles she will hopefully start draining from the ureters into the bladder again. After 10-14 days, to test the nephrostomies, inject dye into the tubes and see if it comes out in the Foley catheter. You should wait for the urine to clear between testing the right and left sides. This should confirm that the ureters are open. If the ureter fails to open after several weeks, it will have to be re-implanted abdominally.

The 4 F's: Flush, Fluids, Frusemide and Free the sutures or the ureter.

Case History 1: A patient had a large VVF repair done vaginally. During the operation, both ureters were in the angles of the repair and were catheterized. On day 2, both ureteric catheters were accidentally pulled out as they had not been well secured at the end of the operation. The patient failed to pass any urine and after 24 hours, bilateral nephrostomies were performed (see Appendix 5). One of the ureters re-opened but the other needed re-implantation; this was done at 6 weeks after the initial repair was well healed.

Case History 2: A patient had a VVF repair. The right ureter was not found despite the intra-operative administration of frusemide. The left was catheterized. On day 10 when the left ureteric catheter was removed, the patient became anuric. Ultrasound showed bilateral hydronephrosis. Anuria persisted more than 24 hours despite frusemide and fluid challenge. The left ureter was re-implanted abdominally. At laparotomy, the bladder was very small, with thickened walls. The left ureter was approximately 2 cm in diameter and very oedematous. Comment: It is unusual for ureters to obstruct so late but it seems to happen occasionally. The only mistake you can make is taking the ureteric catheters out too early. The other management option here would have been to do a temporary nephrostomy as in Case History 1.



It is useful to summarize the indications for urgent intervention when the ureter(s) are obstructed. Pain alone is not an indication.

- (1) Obstruction in the presence of renal failure.
- (2) Obstruction in the presence of a unilateral kidney.
- (3) Obstruction in the presence of sepsis.

(3) (DRY) IS URINE IS LEAKING? DOES SHE HAVE AN URGE TO VOID?

Check daily that the patient's bed is dry. Most breakdowns of repair occur around day 8-9 post-operatively. If there is urine leaking, first check that the catheter is not blocked by gently flushing it with normal saline. If urine continues to leak, it is best to do a dye test to locate the problem.

If dye is leaking around the catheter (through the urethra): this may be due to:

- A weak bladder neck: This occurs more often when the ureteric catheters are in place as all the tubes keep the urethra open.
- A very contracted bladder.

There is no specific action to take. There is no point inserting a larger catheter. If you are not certain if the leak is around the catheter or not, press firmly with your finger against the urethra as this will stop any leak around the catheter.

If dye leaks through the vagina:

- (a) If it is a large leak with a hole or the catheter felt anteriorly on vaginal examination: the repair has failed and no specific action is taken.
- (b) If the leak is small with no hole felt: leave the catheter in for an extra 2-3 weeks and repeat the dye test. It is worth elevating the foot of the bed and getting the patient to lie prone as much as possible to reduce the leakage (see Fig.11.1). She should only be allowed up for the toilet. A small leak will often close with prolonged drainage as long as most of the urine is draining through the catheter.
- (c) If the dye test is negative but there is clear urine in the vagina, there is likely to be a ureteric fistula.

If a patient has the urge to void: Bladder spasms: are more common after Day 7. The patient may develop pain, urge to pass urine or sudden leakage of urine from around the catheter. Get the patient to drink plenty, exclude infection and a blocked catheter. Oxybutynin or Buscopan 10 mg tds may be given to reduce bladder spasms. As a routine for all cases, only put 5-8 ml into the balloon of the Foley catheter to reduce the risk of spasms.

! Rule of thumb: early breakdowns of VVF repairs (first 5 days) will not heal with prolonged catheter drainage but late ones (7-14 days) may.

! Tip! Always consider an unrecognized ureteric fistula especially if she starts leaking urine in the first few days post-operatively. Do an ultrasound of the kidneys to look for hydronephrosis and do a dye test which should be negative.



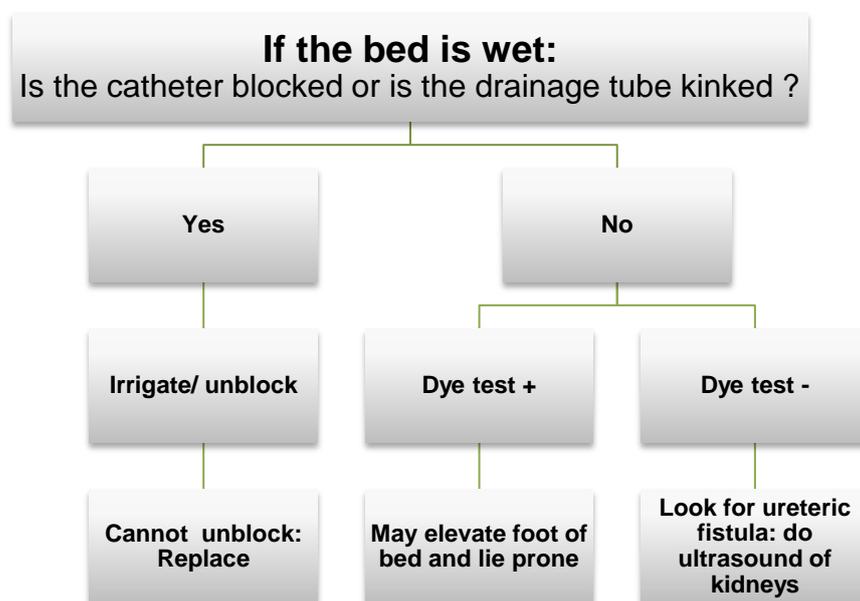
Summary: If the bed is wet, check for:

- Overflow: Is the catheter blocked or tubing kinked? Flush the catheter.
- Stress/ urge: Is she leaking around the catheter? The patient may only be wet on standing.
- Fistula: Is the repair broken down? Is there a ureteric fistula? In the event that a fistula fails to heal, it is usually best to wait at least 6 weeks before attempting repair again. If the fistula is small, mid-vaginal and not very lateral, some would attempt repair after 3 weeks.

! Tip! If the bed is wet, provided you are sure that the catheter is not blocked or kinked, immediate action is not required.

Fig. 11.1: In cases where there is leaking of urine with a positive dye test but no defect is felt, then it is worth elevating the foot of the bed as shown and getting the patient to lie prone as much as possible to reduce the leakage. If the patient is compliant, this is often successful.

 **Tip!** If she is leaking with the catheter in situ, the fistula is not likely to heal. If she only starts leaking after removing the catheter (or she is dry but has a positive dye test before you plan to remove the catheter), an extra 2-3 weeks of drainage may allow the fistula to heal.



Flow chart for managing a patient who starts to leak urine post-operatively.

	Do not be tempted to re-operate on a patient for leaking in the first 48 hours. This has been advocated in the past but the results are not good. You will only make the problem worse.
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(4) GENERAL AND VAGINAL CARE

- *Pack:* The vaginal pack can be removed after 24-48 hours.
- *Care:* The external perineal area should be cleaned twice daily while the Foley catheter is in situ.
- *Vaginal discharge:* If the patient is having a vaginal discharge post-repair with no fever: this can be due to either the sutures dissolving or a small area of necrosis on the suture line. In most cases, the only treatment needed is to do sitz baths. Antibiotics are usually not indicated. With a copious discharge, consider the possibility of:
 - Retained swab in the vagina or a swab left in between the bladder and vagina.
 - If a flap has been placed, it may be flap necrosis. In addition to excising the necrotic area, irrigate the vagina twice daily with saline.
- *Odour alone:* If there is a mild odour from the vagina, in the absence of pyrexia or obvious breakdown of the wound, this usually indicates a hygiene problem. Clean the vulva and instruct the patient to have sitz baths.
- *Bed rest/ mobilization:* There are no fixed rules about this. Whatever the patient's activity, it is important not to have any pull on the catheter. Early mobilization reduces chest infections, venous thrombosis and ileus. Even if the open drainage method is used, the patient can walk around with the tubing draining into a bucket.

(5) REMOVAL OF URETERIC CATHETERS

When removing the ureteric catheters, it is a good idea to remove them one at a time. If after removing one, there is no urine coming through the Foley during the next 24 hours, then do not remove the second one as this would indicate that there is an obstruction on the side the catheter was removed. If you remove both at the same time, there is a possibility that both could obstruct.

Case History: A small, 1.5 by 2 cm juxta- cervical VVF with slight scarring was repaired with two ureteric catheters inserted during the operation and kept in post-operatively. The dye test after the procedure was negative. The patient was dry and both ureteric catheters were producing urine. After a week, the ureteric

catheters were due for removal. One came out easily but the other one was stuck. Over a few days, several attempts to pull it out failed. Then one time it was pulled on so hard that it broke. X-ray confirmed that the ureteric catheter was still partially in-situ. The patient started leaking and on inspection, there was a 1 cm defect in the repair now. Through that gap, the remaining broken ureteric catheter was removed. The patient had another VVF repair after 3 months.

Lessons: 1. Be very careful putting your stitches when closing the bladder not to catch the ureteric catheters. 2. Pulling hard on the ureteric catheter rips open the repair. Just wait till the ureteric catheter eventually comes out easily or falls out by itself.

Case History: A patient had a VVF repair. The left ureteric catheter never drained post-operatively. She presented on Day 10 with pain and a mass on the left side. At laparotomy, it was found that the left ureter had been perforated by the ureteric catheter. After drainage of the fluid, the left ureter was re-implanted into the bladder. Lesson: Never use force when inserting a ureteric catheter.

(6) REMOVAL OF THE FOLEY CATHETER

The purpose of the catheter after a repair is to allow the bladder to heal while empty and decompressed so that there is no tension on the repair site. The catheter is kept in until there is sufficient wound healing at the repair site which depends on a number of factors: (a) The size and complexity of the repair (b) Whether it is a first or repeat repair (c) The repair technique and skill of the surgeon (d) Patient factors which may affect healing such as diabetes or HIV.

Browning (unpublished data) found that most of his repair breakdowns occurred between day 7 and 9 so it would seem sensible to keep a catheter in for at least this duration.

The ideal duration of bladder catheterization in post-fistula repair patients is unknown. Although widely used in practice, the traditional 14 – 21 days duration of catheterization after fistula repair has been challenged more recently.

Nardos showed that the outcome of postoperative catheterization for 10 days was not inferior to that for 14 days. However, this randomized trial excluded repeat repairs and circumferential defects. All cases were performed or supervised by an experienced fistula surgeon.

Reference: Nardos R, Menber B, Browning A. Outcome of obstetric fistula repair after 10-day versus 14-day Foley catheterization. Int J Gynaecol Obstet. 2012;118:21-3.

Barone in another randomized trial showed that seven days of bladder catheterization was not inferior to 14 days. The problem with this trial is that it only included simple fistulas and even then no clear definition of a simple fistula was given but would usually mean mid-vaginal, not much scarring, not involving the urethra and < 3 cm size.

Reference: Barone, MA, Widmer, M, Arrowsmith, S et al. Breakdown of simple female genital fistula repair after 7 day versus 14 day postoperative bladder catheterisation: a randomised, controlled, open-label, non-inferiority trial. Lancet Vol 386 No 9988 pages 56-62 July 2015.

Fistula surgeons need more evidence to be able to reduce the duration of postoperative bladder drainage without the anxiety about increased repair breakdowns. This is partly based on the experience of seeing fistulas which initially have a positive dye test at the time of intended catheter removal that go on to heal with an extra 2-4 weeks of catheterization.

In developed countries, there is a great pressure to minimize the length of stay in hospital and there is usually an excellent back up health system so that readmission can be undertaken quickly and without difficulty. In developing countries the pressures are different. It is extremely difficult for patients to be readmitted or to come back for another operation in the future. The journey home itself is a hazard as it can be many hours without the ability to void. Therefore, a more conservative approach is better to ensure a healed wound will stay healed. My advice would be if there is any concern, it is usually better to maintain catheter drainage a little longer rather than to remove it too early. So 14 days should stay the norm but may be reduced in very simple fistulas or where the surgeon is experienced. The following are some of the less conservative practices in use:

- If bladder fistula and first repair = 10- 12 days.
- If bladder fistula and repeat repair = 12- 14 days.
- Following repair of surgical / iatrogenic fistulas = 12 days.

Before you remove: Do a dye test immediately before removing the catheter. If positive, keep the catheter in for up to 6 weeks. Repeat the dye test every 2 weeks until negative.



Top Tip! An important rule is that if the patient is dry with the catheter in, the fistula will heal.



- You must warn the patient that if she fails to pass urine within two hours of removal of the catheter, she must report to the medical staff. Otherwise, a full bladder can put the repair under tension and this can lead to breakdown of the repaired fistula.
- 1-2 hourly voiding initially should be encouraged. It may also be necessary to wake up patients once or twice during the night for the same reason.
- Check the residual urine volume at the end of the day the catheter is removed (see below).

If the balloon of the Foley catheter will not deflate: This is not an uncommon situation depending on the quality of the catheters used. There are several options:

- (i) You can burst the balloon by inserting a needle through the vagina/ bladder which is easy to do if you apply a little traction on the catheter to steady it. However, there is a risk that the balloon will not only burst but break up, leaving fragments in the bladder and risk of stone formation. So you must check that the balloon is complete on removal.
- (ii) Cut the catheter proximal to where the urine and balloon channels meet. Sometimes this alone allows the fluid in the balloon to drain. If not, inject 1-2 ml of halothane or ether into the balloon channel close to the urethra. You have to draw the halothane up in a syringe and inject it quickly as it can start dissolving the syringe. Wait a few minutes for it to dissolve the balloon before you start pulling on the catheter.

If the Foley catheter has been caught by a suture, it is best to leave it in place and wait for the suture to dissolve. The balloon is deflated and often the catheter falls out. If not, each week gently pull in order to see if the catheter will come out. However, if you pull hard, you may tear the repair open.

Post-operative care after procedures for stress incontinence:

It is simpler to leave in the Foley catheter for seven days as there is a high risk of retention when removed earlier. Retention of urine is the main problem of which to be aware. Often the patient develops overflow which may only present as leaking. Therefore it is important to check residual urine volumes as a routine.

(7) URINARY RETENTION POST CATHETER REMOVAL

Some patients (estimated to be about 10%) develop urinary retention when the catheter is removed after fistula repair. With retention of urine, some will not pass any urine, some will pass small amounts frequently (overflow) and others are completely wet. It is not always obvious so a high index of suspicion is required.

Diagnosis: After any repair or operation for stress incontinence, the patient should have at least one measurement of residual urine volume. This is best done at the end of the day that the catheter is removed and repeated the following day. A residual of < 50% of the voided volume e.g. if patient voids 100 ml and the residual is < 50 ml, is acceptable. If the residual is high:

- Put the catheter back in for another week. If after one week it is still high, teach the patient intermittent self-catheterization after each void (Fig. 11.2).
- Another option is to do what is known as bladder re-training. The Foley catheter is left on free drainage for two days. It is then clamped and released every two hours and left on free drainage over night. Do this for two days and remove the Foley and re-check residual volume. In one unit 70% of patients are voiding normally after this time. However, there is a danger in clamping urethral catheters unless you are 100% confident in nursing staff – otherwise 2 hours becomes 4, 6, 8 hours, and you rapidly end up with an over-distended hypotonic bladder (and long-term voiding problems).
- Another option is to try conservative steps without catheterizing like double voiding and suprapubic pressure. Double voiding means emptying the bladder twice, usually 15 seconds after the first void. Residual volumes with these steps should also be checked.
- Do intermittent self-catheterization (see Fig. 11.2). Once the voided to residual ratio reaches 2:1 or the residual is less than 150 ml, the patient can stop doing intermittent catheterization. If she is going home and may not be able to return for follow-up, tell her to keep doing it until there is little or no urine coming out when she introduces the catheter.

- *With non-atonic bladders* i.e. sensation of fullness and obstructed voiding, she will probably need to do self-catheterization 3- 5 times a day. Some patients get wet with a few hundred mls of urine probably because obstruction makes the bladder unstable.
- *With atonic bladders* i.e. no sensation of fullness and overflow when the bladder gets up to about one litre, she will only need to self-catheterization 1-2 / day. This will empty one litre of urine and the bladder then takes many hours to refill to this volume. Doing self-catheterization once a day is enough to protect the kidneys from bladder pressure. Many atonic bladders never recover. If there is recovery then she will have return of sensation and begin to void but before you stop self- catheterization you need to be sure the residuals are not above 500 ml which still has a risk of damaging the kidneys.



Intermittent self-catheterization

- The patient is best taught while sitting on a bed or the floor. No vulval swabbing is necessary. A combination of using a mirror and self-palpation is used. The right-hand stretches the labia apart while the left-hand inserts the catheter.
- She should wash her hands before the procedure.
- After use, the catheter is cleaned by washing with water.
- The procedure should be performed as frequently as necessary to keep the bladder volumes below 500 mL.

Fig. 11.2: Shows the position for self-catheterization. A mirror (orange frame) is used as shown so the patient can see her urethral opening.

(8) DISCHARGE HOME

- It is a good idea to keep the patient in hospital for a minimum of two days after removal of catheter for two reasons:
 - Infection: The risk of urinary tract infections is high especially after removal of the catheter.
 - If the patient is leaking or in case of retention, the best chance of cure is if the catheter is re-inserted in the first month.
- The patient is advised:
 - Not to have coitus for three months. It is also advised to avoid heavy lifting for three months.
 - She should be advised on family planning.

	<p>Make sure the patient empties her bladder regularly on the trip home. Patients often try to hold on for eight hours or more in a bus, then feel a pop and they start leaking! It is safer to give a supply of diapers for the journey home to avoid this problem.</p>
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(11.2) COMPLICATIONS AND MORTALITY IN FISTULA SURGERY

Before any operation, check: (a) Indication (b) Which operation (c) Fitness of the patient: Avoid booking a patient who is not fully fit just because there is a slot on the list the next day.

(1) HAEMORRHAGE

Exclude bleeding disorders if any of these occur. Check the platelet count and look for splenomegaly (hypersplenism).

- *Primary (in the first 24 hours post- operatively) vaginal:* Never manage this problem on the ward; always take the patient back to the operating room. Either suture the bleeding point or re-pack with a pack soaked

in adrenaline (1 ampoule of 1 in 1000 diluted in 200 ml saline). Suturing the pack in place with 2-3 sutures in the labia majora is a useful tip. Also, elevate the foot of the bed when back on the ward.

- **Secondary (after 24 hours and before 6 weeks) vaginal:** This is less common and may be due to infection or unrecognized slow primary haemorrhage. After resuscitation, take the patient back to the theatre. Look for any arterial bleeders, which are seldom found. So in most cases just insert a pack with adrenaline into the vagina for 24 hours. Elevate the foot of the bed when back on the ward. Rarely haemostatic agents such as Floseal, Surgicel or even balloon tamponade may be required.
- **Primary bladder:** This is uncommon. The initial treatment is to flush the bladder until the urine is clear and this may avoid having to reopen the bladder. If clot retention develops, you may have to take the repair down to find the bleeding point.

Case History A patient developed severe pain a few hours post-repair. The catheter was found to be blocked and when it was changed, 300 ml of blood came out. The patient was taken back to the operating room and the repair reopened. A bleeder was found and the bladder was closed again.

- **Secondary bladder:** This is also uncommon. The first step is to put in a large bore Foley (preferably 20-24 F unless contraindicated by urethral reconstruction). This decreases the risk of clot retention. Then using a bladder syringe, push in 60 ml saline and forcibly pull it back out. Use one syringe-full at a time. This only works when a big Foley is in place. Continuous bladder irrigation has to be used with great caution in the post-operative care of fistula patients because if there is more fluid going in than coming out, it will blow the repair.

Case History: A patient had a VVF repair performed vaginally. On day 2 post-operatively she developed haematuria with clots. The bladder was irrigated with a syringe/ saline 1- 2 times daily. This was continued 1- 2 times daily. As the haematuria persisted, on day 6, the patient was taken for suprapubic cystostomy (extra- peritoneal approach). There was a small bleeder to the right of the ureteral orifice which was ligated. The bladder incision was closed and a suprapubic catheter was inserted. Continuous bladder irrigation was performed for two days with saline solution 1 litre 8 hourly. The patient had no more problems post-operatively and the fistula healed well.

(2) TRAUMA TO SURROUNDING STRUCTURES DURING REPAIR

- Trauma occurs most commonly to the ureters. The ureters are particularly at risk with repeat repairs as it can be difficult to visualise the ureters through a small scarred fistula. Most ureteric injuries go unnoticed and symptoms like pain and vomiting are unreliable indicators although when they occur, you should at least investigate with an ultrasound of the kidneys.
- Rectal injuries occur occasionally when cutting scar in the vagina.
- Haematometra and secondary infertility may occur if the cervix is closed over.

(3) FAILURE OF REPAIR

Failure may occur of the repair with the result that the patient may now be inoperable. If an RVF fails, leakage of stool may lead to sepsis.

(4) HYPONATREMIA

This has been reported with a large intake of water. The patient may present with confusion. Hypertonic saline and frusemide are used in the treatment. To avoid this complication, patients should not be encouraged to take more than 4 litres per day.

(5) SEPSIS

Despite the use of prophylactic antibiotics, in the only large study of post-operative mortality associated with repair of genital fistulas, nearly half of all deaths were related to sepsis. Sepsis is also the commonest cause of morbidity in the post-operative period. The site of sepsis is most often in the genital or urinary tract. *Reference: Mortality risk associated with surgical treatment of female genital fistula. Ruminjo J et al: IJGO 126 (2014) 140-145.*

- In genital tract infection, pyrexia and a bad vaginal odour are the more obvious signs. The diagnosis is confirmed as pus is released when the vaginal incision is opened. Always exclude a retained swab in the bladder or in the vagina as a cause of sepsis.
- Urinary tract infections are seen much more commonly than genital tract infections and are the commonest cause of severe sepsis. High fluid intake reduces the risk of pyelonephritis.

- Infections often go unrecognised until it is too late. In addition to fever, look for tachycardia, tachypnea, hypotension and altered mental state.
- Temperature should be recorded at least daily in all post-operative patients. In febrile patients, after excluding malaria, start antibiotics and consider if intravenous fluids are needed.

SEPTIC SHOCK/ RENAL FAILURE

Shock is treated with a combination of crystalloid fluids ± vasopressors.

Fluids: If the systolic blood pressure is < 90 mmHg give :

- Initial fluid bolus (30 ml/ kg) unless there is convincing evidence of significant pulmonary edema e.g. give 3 liters administered in the first three hours.
- Subsequent fluid therapy should be administered in well-defined (e.g. 500 ml), rapidly infused boluses. The clinical and hemodynamic response and the presence or absence of pulmonary edema must be assessed before and after each bolus.
- Patients with septic shock often require a total of 4-6 litres or more of crystalloid solution.

Vasopressors: For patients who remain hypotensive despite adequate fluid resuscitation (eg, 3L in first three hours), vasopressors should be given. A simple regime is to add one ampoule of adrenaline (1 mg or 1 ml of 1:1000) to 500 ml of crystalloid. This is then run at a rate to keep the systolic blood pressure over 90 mm Hg. If hypertension develops, the rate is reduced. In hypotensive patients, the pulse usually reduces with adrenaline as the blood pressure rises so do not be worried about giving it just because there is already tachycardia.

- If haemoglobin levels fall below 7 g/ dL, red blood cell (RBC) transfusion is recommended to a target haemoglobin range of 7-9 g/ dL.
- Supplemental oxygen should be administered to all patients with suspected sepsis

Oliguria/ Renal failure: (a) Pre-renal: fluid challenges as above. (b) Post-renal: Do ultrasound of bladder and kidneys to exclude this. (c) Renal: If still oliguric after fluid challenge, give 200 ml of 20% mannitol. Also frusemide 40 mg hourly provided the systolic blood pressure is > 90 mmHg.

CONCLUSIONS

- Many of the post- operative problems can be prevented by taking time during the surgery to avoid injury to the ureters, ensuring good haemostasis and giving adequate antibiotic prophylaxis.
- Encouraging a high fluid intake post-operatively also helps to avoid many problems especially blockage of the catheters and urinary infections.
- As problems may still occur post- operatively, routine observations are important to identify problems early. Sepsis remains the biggest killer in the post-operative period.

	<p>Mortality following fistula surgery is generally low. However, it is higher in:</p> <p>(a) Patients who have been sick postpartum and lost a lot of weight. Delay any surgery until she has regained her normal body weight.</p> <p>(b) Patients who need a second operation soon after the first. It is usually the second mistake in response to the first mistake that kills the patient. Therefore consider the following: While haemorrhage or sepsis need urgent surgery, in other conditions alternatives to surgery (e.g. nephrostomy for obstructed ureters) may be better. Also, consider more expert anaesthesia or surgical help.</p> <p>(c) Older patients who often have unrecognised medical problems. While there is no fixed upper age limit for fistula surgery, remember little old ladies can be big trouble!</p> <p>Before any operation, ask yourself: (a) What is the indication? (b) What is the correct operation (c) Is the patient fit for surgery?</p>
<p>KEY STEPS TO AVOID COMPLICATIONS IN FISTULA SURGERY</p> <ul style="list-style-type: none"> • <i>Haemorrhage:</i> have blood available especially for complicated cases. Optimise haemoglobin pre-operatively. Use diluted adrenaline infiltration. Do staged VVF + RVF repairs. • <i>Infection:</i> make sure antibiotic prophylaxis is given. Ensure good fluid intake post-operatively. • <i>Trauma:</i> the ureters are always closer than you think. Know where they are at all times. 	