

CHAPTER 1A

DIAGNOSING THE CAUSE OF URINARY INCONTINENCE

When a patient presents with leakage of urine (especially postpartum), beware of causes other than a fistula. Table 1 summarizes the possible causes of leakage and treatment.

TABLE 1: CAUSES AND TREATMENT OF URINE INCONTINENCE POSTPARTUM		
Type	Diagnosis	Treatment Options
<i>Stress</i>	Urine leaks via urethra with cough or Valsalva and retention of urine is excluded.	<ul style="list-style-type: none"> • Conservative: Pelvic floor exercises • Urethral plugs (if available) in severe cases only • Surgery.
<i>Urgency</i>	History of urinary frequency and nocturia i.e. getting up >2 times per night. Exclude infection and diabetes.	<ul style="list-style-type: none"> • Pelvic floor exercises; reduce caffeine intake • Anti-cholinergics e.g. Oxybutynin 5 to 15 mg/day. • Bladder drills: timed voiding.
<i>Overflow</i>	The bladder is enlarged. The residual urine volume is high. Often wet day and night.	<ul style="list-style-type: none"> • Catheterization: intermittent or continuous drainage • Timed voiding and double voiding. • Alpha blockers to relax bladder neck.
<i>Fistula</i>	If the patient is wet day and night, always consider a fistula, either bladder (vesico-vaginal) or ureteric.	<ul style="list-style-type: none"> • If vesico-vaginal fistula (VVF), catheter treatment only works in small (< 3 cm) and early (< 3 weeks) fistulas. • Surgery for the rest.

TABLE 2: DIAGNOSING THE CAUSE AND SITE OF URINARY INCONTINENCE	
HISTORY: There are four key points which should be evaluated especially when language is a barrier:	
<i>(1) Urine</i>	Ask when she leaks: If she leaks urine day and night, she probably has a fistula. <ul style="list-style-type: none"> • <i>To exclude other causes:</i> If leaking only occurs during the day and she is dry at night, this suggests stress incontinence. • <i>To elicit site of fistula:</i> If she passes urine normally as well as leaking, this suggests a ureteric fistula or a small bladder fistula.
<i>(2) Bowel</i>	<ul style="list-style-type: none"> • Ask about leakage of stool or flatus to exclude a recto-vaginal fistula (RVF). If you do not ask this specifically, the patient may not volunteer the information and it can be easy to miss an RVF or a 4th degree tear on initial examination. • Ask about constipation as frequency and urgency of micturition may be secondary to this, especially in younger patients.
<i>(3) Last menstrual period</i>	<ul style="list-style-type: none"> • Assess the possibility of pregnancy, which is easy to over-look in these patients, as amenorrhea may be present for other reasons. • Operating during pregnancy should be avoided because of increased vascularity and risk of miscarriage.
<i>(4) Surgery+ Past history</i>	If leaking started soon after childbirth or surgery, then it is more likely to be due to a fistula. <ul style="list-style-type: none"> • Ask about any previous operations including attempts at repair. • Ask about the delivery. If the baby is alive, this suggests either: <ul style="list-style-type: none"> ○ an iatrogenic fistula involving the bladder or the ureters if she had a CS ○ stress incontinence if she delivered vaginally.
EXAMINATION	
<ul style="list-style-type: none"> • General: Assess temperature, nutritional status and Haemoglobin. Poor nutritional status means that any surgery should be postponed, in some cases for many months. • Abdominal: Examine especially for an enlarged uterus or bladder. Check for splenomegaly as often associated with a low platelet count and potential bleeding problems during surgery. • Pelvic: The order of pelvic examination is shown in the following flow chart. Examination is performed with the aid of a Sims speculum as in Fig. 1.1 b and c. • Legs: Look for the presence of a foot drop as the patient walks in. If present, encourage to walk with a stick or a walking frame. 	

 **Tip!** If a probe or Foley catheter fails to pass through the urethra, this usually indicates that there is a stricture due to a circumferential juxta-urethral VVF.

 **Tip!** Even if you see urine coming through the urethra, the patient may also have a small fistula.

 **Rule of thumb!** Urine incontinence after vaginal delivery + Baby still alive = stress incontinence.

<p>Inspection Is she wet? Look for any excoriation of the skin.</p> <p>Is urine coming from urethra or vagina? Ask her to cough to look for stress incontinence.</p>	<p>Palpation Feel for an obvious fistula or full bladder on pelvic exam. If bladder full, ask her to empty and then measure residual urine.</p>	<p>Speculum Look for defect and pass probe through it. If no obvious fistula, do a dye test.</p>	<p>Catheterize Check for any stricture. Do a dye test up to 180 ml to look for VVF. If dye test negative, look carefully for any urine in vagina = ? ureteric fistula.</p>	<p>After removing catheter Look for any leakage from urethra and vagina. If not, get her to cough. May do a void test and measure residual volume.</p>
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To diagnose a VVF: First feel on vaginal examination. Then confirm this by seeing it with the aid of a speculum and if necessary by doing a dye test. The lithotomy position is one way to examine the patient although it is easy to miss distal fistulas near the urethral meatus. Sims position with the patient lying on her side is a better way to look for a fistula as it gives a good view of the anterior vaginal wall. Note that the patient's right leg does not have to be held up although an assistant retracting the upper buttock improves the view as in Fig. 1.1 b and c.



Fig.1.1a: Sims position



Fig. 1.1b: Shows a metal catheter being passed through the fistula.

You are looking for:

- Any defect, scarring or granulation tissue in the anterior vaginal wall from the cervix to the urethral opening.
- Get the patient to cough and look for a spurt (jet, squirt) of urine coming through a small defect.
- You need to confirm the presence of a defect by passing a small dilator via the urethra and then out through the fistula (Fig. 1.1b). Alternatively, just do a dye test without probing.
- Note the site, size and scarring around any fistula found.

To do a dye test: If a vesico-vaginal fistula (VVF) is not obvious, diluted methylene blue or gentian violet is placed in the bladder via a Foley catheter. With a very small fistula, it may be necessary to insert up to 180 ml. A swab should be held over the urethral opening to prevent any leakage around the catheter. After instilling dye, ask the patient to cough or perform a Valsalva manoeuvre.

Fig. 1.1c: Shows a dye test being performed. The dye is just visible in the vagina. Note that an assistant is retracting the upper buttock.



If positive dye test

- If dye is seen in the vagina, this indicates a VVF.
- If a vesico-uterine fistula is suspected (post-Caesarean section), it helps to pass a dilator into the cervix which allows the dye to come out faster through the cervix.

If negative dye test

There are two main possibilities:

- (a) She may have a very small VVF or a vesico-uterine fistula with the dye taking several minutes to flow into the vagina.
- (b) She may have a ureteric fistula. Look for clear urine in the vagina. In either case, it is worth doing a swab test.

! Top tip! Swab Test: Put 2-3 dry swabs (gauze or cotton wool) in the vagina. After injecting 180 ml of dye into the bladder, remove the catheter and get the patient to walk around for 30 minutes. Then remove the swab:

- If the swabs are wet but not stained with dye, this suggests a ureteric leak either post-surgery or congenital ectopic ureter.
- If the inner swab is stained with dye = VVF but repeat the dye test in theatre.
- If only the outer swab is stained with dye = ? stress

Double Dye Test: This can be used to confirm a ureteric fistula. It can only be performed by administering phenazopyridine taken three hours before examination which turns the urine in the kidneys and ureters orange. With ureteric fistulas, there will be orange fluid in the vagina. A positive phenazopyridine test result with a negative blue test result strongly suggests a ureteric fistula. An alternative dye is to give Indigo carmine IV.

	Pain is an unusual symptom in VVF patients so if present exclude the presence of a bladder stone or tumour. If there is purulent urine, this also indicates the presence of a stone, tumour or a retained swab in the bladder from a previously attempted repair.
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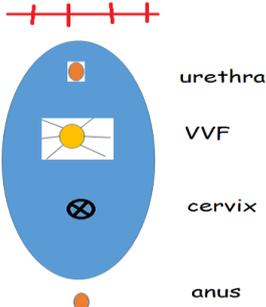
DIAGNOSIS OF URETERIC FISTULA (see also chapter 9)

- Ask your patients to drink 1 liter of water just before you examine them. You can organize your waiting area as a drinking area. This makes the examination much easier so that you can often diagnose a ureteric fistula at the first examination as you should see clear urine in the vagina with a negative dye test.
- It is common that a wrong diagnosis of vaginal discharge is made especially if she is not well hydrated.
- The patient will often give a history of pain in the renal angle before the urine starts leaking. Ask about this.

Rules of thumb: (a) In a patient with clear urine in the vagina + negative dye test = ureteric fistula. (b) Negative dye test + scar on the abdomen = ureteric fistula. (c) If a patient with urinary incontinence is also febrile, exclude a ureteric fistula. Fever is uncommon with bladder fistulas.

If congenital ectopic ureter is suspected: This is usually diagnosed in a child or adolescent although may be an adult. It is worth doing an examination under anaesthesia. In addition to doing a dye test, give fluids and frusemide intravenously. As the amount of urine coming through the ectopic ureter may be small, you have to examine the whole vagina carefully over 30 minutes to see the spurt/ jet of urine. If you see a jet/ spurt of urine, try to pass a ureteric catheter up the track to see if urine flows through the catheter. This will help localize the side especially if the opening is in the midline. If the opening is to one side, then that is the affected side.

- Ideally, an intravenous pyelogram is performed as other abnormalities may be present as well.
- If the child is very young, surgery can be delayed until later as there is not usually any obstruction.
- Diagnosis of ureteric fistula + no previous surgery = think of ectopic ureter irrespective of the age of the patient.

BRIEF HISTORY, EXAMINATION AND INVESTIGATION IN A FISTULA CASE	
	<ul style="list-style-type: none"> • Previous repairs or any surgery? • Urethra: Length/stenosis; Is she wet at night or only during the day? • VVF: Site/ Size/ Scarring / Single or multiple/ Stones excluded/ Vaginal length • Last menstrual period: exclude pregnancy • RVF: does she leak stool or flatus? <p>Ultrasound of the kidneys is useful in all cases but especially to help diagnose a hydroureter and hydronephrosis which will help localize the side of a ureteric fistula.</p>

POSTPARTUM STRESS INCONTINENCE

- This is a relatively common problem due to weakness of the pubo-cervical fascia and the pubo-urethral ligaments so that it can no longer support the posterior urethra. Stretching and attenuation of the fascia may occur during pregnancy or childbirth. There is either a midline defect of the fascia or the whole fascia is overstretched. Separation of the pubic symphysis is a factor in some cases. Up to 30% of women will develop transient incontinence for up to 6 months after delivery and most patients improve with time.
- The normal (mobile) urethra requires a non-mobile fascia and vagina to close against. If the fascia and vagina become too mobile (i.e. it is an early form of cystocele), then the urethra does not function properly. This results in urethral hyper-mobility.
- While there has never been a randomized controlled trial to show that pelvic floor exercises are effective, the woman may feel better subjectively. If, by contracting the pelvic muscles prior to and during a cough, a woman is able to decrease her leakage, then simply learning to use pelvic muscles may be an effective therapy for her.
- Another option is to place a Foley catheter for 4 weeks. Since the endopelvic fascia is defective or overstretched, by keeping the bladder empty this will contribute to better healing of the endopelvic fascia.
 - (a) *If she leaks only on coughing or straining*, it is worth trying conservative steps for 6-9 months. If the problem persists, then surgery may be considered. The options are:
 - Fascial plication: The defect is usually due to overstretching of the endopelvic fascia or a midline defect in it. Usually, a midline plication of the fascia works well and is a low complication

procedure (see section 6.3 for technique). There is not usually any anterior defects so the fascia does not need to be re-attached to the pubic bone but always check that the fixation is intact.

- Synthetic sling: Success rates long term are 90%. Mesh is designed so that the mobile urethra can descend and close against the sling so it should work well in this condition.
 - Autologous fascia sling.
- (b) *If she is leaking all the time*, not just with a cough or strain, then it is unlikely to fully resolve. In these cases, surgery can be performed earlier if the problem persists more than 12 weeks post-partum. This partially depends on how far the patient lives and whether she is likely to come back for review.

	Having a catheter in even for a short time may compromise sphincter function; stress incontinence is very common immediately on catheter removal, but sometimes resolves a minute or two later, as normal closure function returns.
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OVERFLOW INCONTINENCE (atonic bladder): This occurs after a prolonged labour with overstretching of the bladder muscle. In labour, the fetal head compresses the urethra resulting in a full bladder. The patient often presents with leaking of urine rather than retention or incomplete emptying. Palpate and scan for a full bladder. On ultrasound, the bladder size is > 15 cm and the bladder pressures stay low despite high volume filling so the upper urinary tract stays normal. The initial treatment is to leave a catheter in for 4 weeks. If the problem persists, either continue with an indwelling catheter for another 4 weeks or teach the patient intermittent catheterization. See chapter 11.

	With overflow incontinence, because urine comes through the urethra when the patient coughs, it is often misdiagnosed as stress incontinence although usually the patient is wet in the bed as well as with standing. The diagnosis is made by measuring the residual urine after voiding. Most healthy young women should have a residual urine volume under 100 mls. Alternatively, if the residual volume is more than 50% of the volume of urine passed, it is high.
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Patients with spina bifida often present to fistula camps with urinary incontinence. In spina bifida, the bladder neck can be either: (a) Closed: resulting in high pressure and overflow incontinence. The treatment is intermittent catheterization (b) Open: resulting in stress incontinence. These cases may be suitable for a sling procedure.

Enuresis in young adults: Exclude secondary causes e.g. diabetes, infection, constipation. Advise setting an alarm after 2-3 hours of sleep to empty bladder. Also, reduce fluid and caffeine intake in the evening. Bed wetting alarms are now an option (30\$). Drugs: Imipramine 50 mg nocte; Anti-cholinergic oxybutynin 5 mg nocte.

