**Vesico-vaginal fistula**
Fistula is an abnormal epithelialised tract between 2 epithelialised surfaces
VVF common in developing countries due to birth trauma; uncommon in
developed world – typically iatrogenic

**Aetiology (developed world)**
Congenital
Acquired
  Iatrogenic
    Surgical
      Hysterectomy*
      Anterior colporraphy
      Colposuspension
      Subtrigonal phenol

Radiotherapy
Non-iatrogenic
  Advanced pelvic malignancy
  Tuberculosis
  Obstructed labour
  Foreign body erosion

* Hysterectomy accounts for ~ 90% of iatrogenic causes. Bladder injury
  complicates 0.5-1% of all hysterectomies. Incidence of fistula 0.1%.
  Fistula 3 x more common with abdominal than with vaginal
  hysterectomy. NB. In the setting of a difficult hysterectomy, ureteric
  injury is the least likely cause of urinary fistula.

**Presentation**
**Persistent dribbling incontinence**
‘Serous’ discharge and failure to progress after gynae op
Occasionally normal voiding and small loss per vaginum

**Diagnosis**
**History**
  Gynae (malignancy, RT, surgery, endometriosis, cervical Rx)
  Obstetric (obstructed labour, caesarian)
  Urology (malignancy, RT, surgery, neurogenic bladder)

**Examination**
  Fluid for U+E
  Speculum vaginal examination (Cusco)
  Flexible cystoscopy
Three pad dye test occasionally helpful for occult cases.
  [Methylene blue instilled into bladder. Staining of
   upper/mid pads suggests VVF, staining of lower pad SUI.
   Attempts to use IV dye to identify ureteric involvement
   inaccurate and does not obviate requirement for RPG]

EUA, vaginoscopy, cystoscopy and bilateral RPG prior to
contemplating repair (biopsy of the fistula edge mandatory in all
patients with previous or suspected malignancy)
CT urogram with delayed images or VCUG for complex/occult cases

**Management**

(i) Conservative

Prolonged catheter drainage
- Appropriate for surgically unfit patients
- May occasionally suffice for patients with small non-epithelialised uncomplicated (no RT, malignancy, ischaemia TB) fistula following hysterectomy (give Abx; quote 10% cure rate)

**Unlikely to heal if remain open after 3 weeks of catheter drainage**

De-epithelialisation by curetage, silver nitrate, transvesical diathermy (Bugbee) and metal screws all tried followed by catheter drainage. Generally poor results (<10%) with established fistula

Nephrostomy for urinoma, obstruction, ureteric fistulae

(ii) Surgical

Standard surgical principles important: tension-free well vascularised anastomosis with avoidance of overlapping suture lines

Remember SNAP:
- **S** – eradicate sepsis
- **N** – ensure adequate nutrition (?pre-op topical oestrogen)
- **A** – define anatomy
- **P** – determine surgical plan if unexpected problems

Timing of surgery

<table>
<thead>
<tr>
<th>Type</th>
<th>Timing</th>
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<tbody>
<tr>
<td>Iatrogenic</td>
<td>2-3 weeks*</td>
</tr>
<tr>
<td>Obstetric injury</td>
<td>3-6 months</td>
</tr>
<tr>
<td>Radiation fistula</td>
<td>12 months + (allows tissue healing/angiogenesis following obliterative endarteritis)</td>
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* Traditional teaching recommended a delayed period for all fistulas. However early repair at 2-3 weeks believed to be equivalent to delayed repair, and reduces psychological and therefore medico-legal ‘complications’

However best chances of repair = first chance. Therefore:

- < 72 hrs immediate repair
- > 72 hrs 6-8 wks delayed uncomplicated
- 6 months baby/infected
- 12 months radiotherapy

Transvaginal and abdominal approaches described. In experienced hands minimally invasive TV approach a/w equivalent success rates (82-100%); depends on surgeons preference

Vaginal repair

- Labial stitches
- Ring retractor
- Weighted Simms speculum
- Interposition with Martius fat pad

Problems with supply of blood/proliferation
- Difficult to get Martius high (but dual supply - can divide below and rotate from above)
Vesico-vaginal Fistula

Alternative coverage with gracilis, gracilis-based myocutaneous flap, labial or gluteal flaps
Complications include recurrence, vaginal shortening/stenosis and ureteric injury
Abdominal approach reserved for complex fistulae and those requiring ureteric implantation, augmentation etc.
Abdominal repair
  - Bivalve bladder
  - Excise fistula
  - Close bladder 2 layers
  - Freshen and close vagina
  - Interposition with omentum if possible, or peritoneal window from pouch of Douglas
Irrespective of approach, excision of fistula tract not thought to be essential for adequate healing and may be detrimental (bleeding loss of reconstructive tissue)

Figure 4-12 Technique of vaginal repair of a post-hysterectomy VVF. A. Retraction including ring retractor, vaginal speculum, and Foley catheter in the VVF track. A Foley catheter is seen in the VVF track providing traction on the vaginal cuff. B. Mobilization of anterior vaginal wall flap. Laterall flaps are then reformed as well, thereby closing the VVF track. C. Mobilization of posterior vaginal wall flap. D. Initial layer of closure is performed without avoiding the edges of the fistula tract. E. The peritoneal fascia is obliterated with Lembert-type sutures. This layer of closure is perpendicular to the initial suture line. F. The vaginal wall flaps are advanced to avoid overlapping suture lines. (From: Genazzani AR, Silan S, Zimmino P, Leach GE. Vesico vaginal fistula. Reconstructive techniques. In: McMinn M, ed. Traumatic and Reconstructive Urology. Philadelphia, WB Saunders, 1996:317.)
Vesico-vaginal Fistula

A) Bladder opened and fistula exposed

B) Circumferential incision through vaginal wall

Bladder and vagina closed

Omentum interposed