Repair of Bladder Fistulae

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VESICOGENITAL FISTULAE

Vesicovaginal Fistula

Leakage of urine through an abnormal communication between the bladder and the vagina, or vesicovaginal fistula, can be one of the more troubling disorders faced by women so afflicted. In some cultures, uncontrolled leakage of urine from the vagina results in social ostracism (1, 2). In others, women may simply be embarrassed and may view the condition as quite incapacitating. There is little doubt that patients are quite grateful when this condition is corrected.

Most vesicovaginal fistulae were historically caused by childbirth injuries, but improvements in management of labor and delivery have resulted in this condition becoming much rarer after childbirth. Currently, these types of fistulae most often result from complications of hysterectomy or other pelvic operations (3). Cancer- or radiation-induced tissue necrosis can also cause vesicovaginal fistula, and such fistulae are generally more difficult to treat successfully (2).

Historically, the first successful repair of vesicovaginal fistula is credited to Marion Sims (4). He failed in more than 100 attempts before succeeding in May 1849, when he performed curative surgery in a slave who herself had already suffered 29 unsuccessful operations. Interestingly, other surgeons reported cures prior to Sims, so it is unclear why history credits him with the first success. For example, Hayward reported two successes, the first in 1839 and the second in 1847, while Gosset related a cure in 1834 (4).

Current methodology for repair of vesicovaginal fistula emphasizes a number of important principles. These include (1) total separation of the tissues comprising the wall of the vagina and the wall of the bladder, (2) closure of the defects with nonoverlapping suture lines, (3) where possible, interposition of alternative tissue between the two suture lines, (4) control of urinary infection, (5) avoidance of postoperative bladder distension, and (6) attention to proper hemostasis throughout (4, 5). It is still controversial as to the optimum timing of repair of traumatic vesicovaginal fistula. Some believe in repair within a few weeks (6, 7), whereas others recommend the more traditional allowance of a 3-mo delay in order to permit subsidence of edema, inflammation, and the catabolic state that ordinarily persists for a period of time following the initial (causative) surgery. In general, transvaginal repair may be performed sooner after an abdominal causative surgery as the lack of intra-abdominal adhesions via the vaginal route permit earlier repair. There exists no evidence that one cannot successfully operate earlier in the post-event period, assuming there is absence of infection, severe inflammation, or other adverse factors that may preclude a successful repair. Thus, one should try to ensure that the first attempt is performed under the best of conditions.

One debatable advantage to waiting 3 mo before surgery is that a few fistulae may close spontaneously, especially small ones, thus saving the patient an operation (8). Furthermore, although intravaginal, very small fistulae can sometimes be cured with simple fulguration and continuous bladder drainage (9). This may certainly be worth trying before performing an open surgical procedure.

Fistulae resulting from radiation therapy or cancer represent more difficult problems than do traumatic fistulae resulting from pelvic surgery or birth injury. These have a higher recurrence rate and are usually best treated with a transabdominal or suprapubic, transvesical approach (discussed later) (10–12). In most such cases, this facilitates interposition of fresh tissue, such as omentum, between the bladder and the vagina, and has been shown to maximize the success rate of reparative surgery.

Transvaginal Repair

Repair of vesicovaginal fistulae can be successfully performed through either a transvaginal or a suprapubic approach. In this section, transvaginal repair will be discussed first and its advantages described. First and
foremost, a transvaginal repair tends to be lower risk and much less painful than an abdominal repair. This type of repair can often be performed on an outpatient basis or at least with 23-h observation (minimal hospital time). Recovery from surgery also tends to be quicker than for an abdominal operation. The basic principles listed earlier should be followed, and in addition, patient selection for this approach is a key to success. If the fistula is located anatomically in a particular patient such that surgical exposure will be compromised by the vaginal approach, then a suprapubic approach is preferable.

Exposure

A vaginal approach may be performed in either the lithotomy or the Kraske (jackknife) position (Fig. 31.1). The latter has the advantage of permitting the surgeon to work in a normal, comfortable position and is preferred by some authors for that reason. (Repair from the perspective of the Kraske position is illustrated herein; by simply turning the figures upside down, one can obtain the perspective for a surgical approach from the lithotomy position.) One begins by utilizing wide adhesive tape to spread the upper thighs and buttocks laterally. Redundant labia majora may be sewn apart with temporary stay sutures of 2-0 silk clipped to the drapes. A Sims retractor or equivalent is used to retract the posterior vaginal wall upward.

One next inserts a Foley catheter through the fistulous tract into the bladder, and the balloon is then inflated (Fig. 31.2). If one has chosen to use a urethral catheter rather than a suprapubic catheter (for bladder drainage), then this should be kept well out of the way from the dissection; leading it down in a dependent fashion is straightforward if the patient is in the Kraske position. If the fistulous tract is too small to permit insertion of a small catheter (8 or 10 French), the tract can be dilated with a hemostat, lacrimal probes, or Hagar dilators first. If cystoscopy has not been performed recently, or if there is some doubt about location of the fistula (and catheter) within the bladder, then a cystoscopy may be performed at this time. The catheter will help to stabilize the bladder wall during excision of the fistulous tract.

Dissection and Hemostasis

The vaginal mucosa is first injected with 1% xylocaine with epinephrine to facilitate hemostasis and create a plane of dissection in the vaginal wall (Fig. 31.3). Furthermore, there should be minimal bleeding, and thus, no extensive electrocautery or suturing should be needed during the fistulous exposure to minimize potential devascularization. A circumferential incision around the fistula (and catheter) is created through the vaginal mucosa, including an adequate margin of normal tissue, while the catheter is placed on gentle traction to allow the fistula to be brought into the operative field. An inverted J incision is made around the fistula to permit exposure of the flaps prior to fistula closure. The vaginal mucosa is opened by means of sharp dissection with either Metzebaum scissors or curved thoracic scissors.

The issue of fistula tract excision is controversial, but the advantage of leaving it intact is that it allows a strong epithelialized layer to permit closure sutures to be anchored securely (Fig. 31.4). Fistula tract excision may enlarge the fistula, increase bleeding (i.e., one may need to use electrocautery and risk further devascularization injury), or create poor tissue for anchoring closure sutures. The fistula should be closed in at least two and preferably three layers in a tension-free fashion. There should be at least one layer for the bladder and separate layers for the pubocervical fascia and vaginal mucosa.