

Free bladder mucosal autograft in the treatment of complicated vesicovaginal fistula

F. SHARIFI-AGHDAS, N. GHADERIAN and A. PAYVAND

Urology-Nephrology Research Center, Labbafi Nejad Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Objective To describe an effective and simple method for repairing complicated vesicovaginal fistula using a free bladder mucosal autograft.

Patients and methods The study included 14 patients with an iatrogenic vesicovaginal fistula after hysterectomy or prolonged obstructed labour. An initial fistula repair had been attempted in 12 patients. All patients were then repaired using a free bladder mucosal graft technique 3–24 months (mean 8) after the fistula was diagnosed.

Results Of the 14 patients 12 had an immediately successful result, with no evidence of leakage, but two required prolonged catheter drainage. Thirteen

patients remained dry at the follow-up 3–15 months later. Two patients had stress urinary incontinence and three patients had urinary tract infection.

Conclusions The free bladder mucosal autograft technique is a simple, effective and fast method for vesicovaginal fistula repair. The technique produces an excellent repair of complicated vesicovaginal fistula, and appears to be more physiological and easier to perform than other transabdominal techniques.

Keywords vesicovaginal fistula, bladder, surgery, mucosal graft

Introduction

Vesicovaginal fistulae are one of the most troublesome complications of pelvic surgery in women [1]. The abdominal approach is mostly used where there is a large defect (> 2 cm), a high fistula, simultaneous ureterovaginal fistula, additional intra-abdominal pathology and when the vaginal anatomy precludes adequate exposure [2]. Complicated vesicovaginal fistulae include giant fistulae of > 5 cm in diameter (usually of obstetric origin), multiple recurrent vesicovaginal fistulae, and fistulae associated with radiation therapy [3]. We describe a simple method for repairing complicated vesicovaginal fistulae using a free bladder mucosal graft in patients in whom previous conventional repairs had failed.

Patients and methods

The study included 14 patients with complicated vesicovaginal fistula (mean age 48 years, range 33–80 at the time of surgical repair). Their main complaint was urine loss through the vagina after gynaecological surgery. Patients were referred to the hospital 3 months after their last surgery or at the time of the initial injury. The diagnosis of the fistula was confirmed by excretory urography, VCUG and cystoscopy. Twelve patients had undergone a mean (range) of 2.4 (1–4) previous surgical

attempts at fistula repair. All fistulae were located either above or near the trigonal area of the bladder, but the vesico-urethral junction or bladder neck were unaffected. Patients were discharged from the hospital after a mean (range) of 17 (10–30) days after surgery. The mean (range) operative duration was 137 (100–190) min. At the follow-up visits subjective and objective findings were assessed, including a vaginal examination, VCUG and cystoscopy.

Patients were given antibiotics (cephalosporin plus aminoglycoside) and a vaginal douche the day before the operation to reduce the risk of surgical infection. The abdominal skin incision depended on previous scars and was proportional to them. The approach to bladder was extraperitoneal, with a midline cystostomy and ureteric catheters inserted. The bladder mucosa adjacent to the fistula was incised, but no attempt was made to excise the fistulous tract. One to three sutures (mean of two) were used to approximate the edges of the fistula to reduce the dimensions of the mucosal graft required. A free bladder mucosal graft was obtained from an unaffected part of the bladder mucosa (Fig. 1a), placed over the fistulous tract and secured in place with interrupted 4/0 or 5/0 polyglactin sutures (Fig. 1b). The mucosal surface of the graft faced the bladder lumen. Sutures were placed through the juxtaposed mucosa of the adjacent fistula and then through the mucosal graft. The graft was ≈30% larger in all dimensions than the fistula tract.

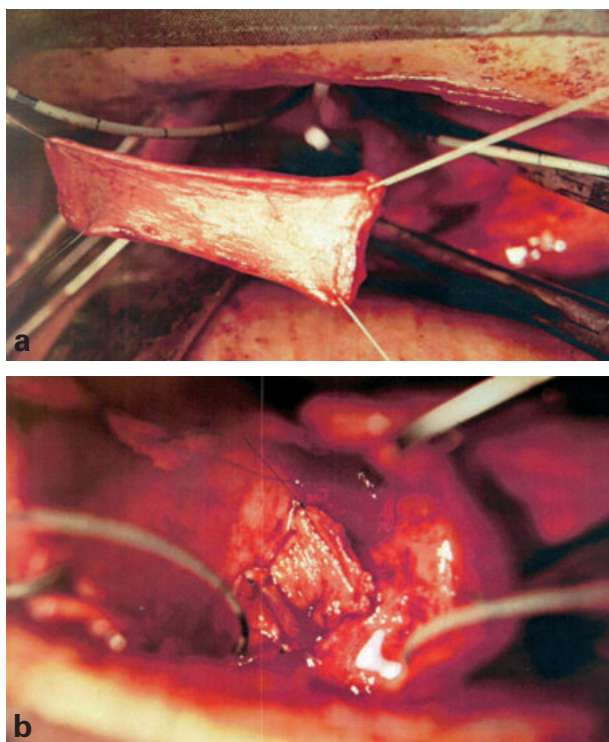


Fig. 1. a, An appropriate bladder mucosal graft is retrieved from an unaffected part of the bladder mucosa; b, the free mucosal graft is sutured to the adjacent urothelium covering each fistulous tract using interrupted 4/0 or 5/0 polyglactin sutures.

The donor bed was allowed to repair spontaneously. The cystostomy tube and urethral catheter were left in place and the bladder repaired in two layers.

Results

Most of fistulae were the result of gynaecological procedures (13 hysterectomies) and one was caused by prolonged obstructed labour. None of the patients had a history of malignancy or pelvic radiation. Previous attempts at repair were by either abdominal or vaginal approaches. Two patients had simultaneous ureterovaginal fistula, in which the ureters were reimplanted during the vesicovaginal fistula repair.

The urethral catheter was left *in situ* for 5 days, and the cystostomy tube for 21 days in 12 patients and 28 days in two (because of the suspicion of vaginal leakage on the cystogram). Twelve patients had immediate success, with no evidence of leakage. Two patients required prolonged catheter drainage because of suspected leakage. Three patients had recurrent UTIs and two had stress urinary incontinence. One of the 14 patients had an abdominal wound infection which was successfully treated after changing the antibiotic. Thirteen patients

remained dry at the follow-up a mean (range) of 7 (3–15) months after surgery.

Discussion

The bladder mucosal graft has been used in urethroplasties for many years. In 1985, Coleman *et al.* [4] reported good results in treating vesicovaginal fistulae using a bladder mucosal autograft in a canine model and in a woman with recurrent multiple vesicovaginal fistulae. In the same year, Brandt *et al.* [5] also reported successful closure of vesicovaginal fistula using bladder mucosa.

In 1993, Raz *et al.* [6] reported success in nine of 11 patients who were repaired using a flap of peritoneum through a transvaginal approach. In 1998, Ostad *et al.* [2] reported good results for vesicovaginal fistula repair using bladder mucosa. In the same year, Brandt *et al.* [7] reported a success rate of 96% in 80 women repaired using bladder mucosa. The early (<2 weeks) and late results in the present study were similar (12 of 14 and 13 of 14).

Brandt *et al.* [7] removed the fistula tract and the surrounding fibrosis, with the graft was positioned so that the blood bed faced the bladder and the mucosal surface faced the vagina; eventually the posterior bladder wall was sutured over the graft. In the present method no attempt was made to excise the fistulous tract, but the bladder mucosa next to the fistula was incised circumferentially, resulting in a blood-bed that revascularized the mucosal graft.

The recurrent UTI in three patients during the first year after surgery was probably caused by prolonged catheterization and hospitalization, but it had no adverse effect on the final result. In the two patients with stress urinary incontinence the fistula did not extend to the vesico-urethral junction or bladder neck, so the incontinence was probably secondary to relaxation of the pelvic floor as a result of the hysterectomy.

In conclusion, the bladder mucosal autograft technique is simple and quick, involves minimal mobilization of the bladder and less dissection of the fistulous tract. The peritoneal cavity is not opened nor the bladder split, to avoid the risk of infection and peritoneal irritation. The graft acts as a biological dressing, avoiding crossed scar tissue formation that could result in a new vesicovaginal fistula.

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Authors

F. Sharifi-Aghdas, Assistant Professor of Urology.

N. Ghaderian, Urologist.

A. Payvand, Urologist.

Correspondence: F. Sharifi-Aghdas, Urology-Nephrology Research Center, Labbafi Nejad Hospital, Boostan 9st Padsaran Avenue, Tehran, Iran.

e-mail: fsharifiaghdas@yahoo.com