The Use of Pedicled Omental Graft in the Transperitoneal Repair of Vesicovaginal Fistula

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To assess the role of pedicled omental graft in the treatment of vesicovaginal fistula, a prospective study was conducted from January, 1996 to December, 2003 in the department of surgery Allama Iqbal medical College / Jinnah hospital, Lahore. 17 patients with vesicovaginal fistula were included in the study. All were having symptoms of persistent leakage of urine per vagina. Seven patients had history of prolonged obstructed labour. 9 patients developed this complaint after hysterectomies for benign conditions, and one patient suffered this complication after caesarian section. An initial operation and prior attempts at fistula repair had been performed in 5 patients. All patients were treated with trans peritoneal repair of VVF with pedicled omental graft. All fistulas healed successfully with this technique at first attempt. One patient (5.8%) had detrusal instability and one patient had superficial wound infection (5.8%).

Key words: vesicovaginal fistula, transperitoneal approach, omental pedicled graft.

Vesicovaginal fistulas (VVF) represent a significant morbidity in female urology. Continual wetness, ordour, and discomfort cause serious social problems. VVF usually result from local trauma and necrosis following prolonged obstructed labour or an iatrogenic event during gynaecological surgery or radiation given to pelvic organs. In cases of iatrogenic events fistulas are typically supratrigonal and occur when the procedure is technically difficult or the ability of local tissue healing is altered by fibrosis, infections or previous radiotherapy.

Injury to urinary bladder with development of fistula was first mentioned 1030 AD in the opus called Al-Kanoon by Arabic physician and philosopher Avicenna (Ali Ibne-Sina)[1]. he noted, "in cases which women are married too young and in patients who have weak bladders, the physicians should instruct the patients in way of prevention of pregnancy. In these patients the fetus may cause a tear in the bladder that result incontinence of urine. The condition is incurable and remains so until death"[2].

The oldest evidence of obstructed labour and vesicovaginal fistula can be found in the remains of queen Henhenit, the wife of Egyptian ruler around the time of 2050 BC. Queen Henhenit belongs to the dubious honour of having suffered the most antique vesicovaginal fistula documented[2].

In 1849, Dr. Marion Sims completely closed the enormous vesicovaginal fistula of Anarcha[2]. Since then many techniques for repair of VVF have been reported by using the vaginal[3], transvesical or transpritoneal approach [4]. Although the surgical results are mainly related to the etiology of fistula and experience of surgeon, success is achieved in 65–96% of cases[5,6]. The surgical failure usually represent a burden for surgeon and the patient who suffer from the distress and social limitation imposed by urine leakage. Thus every one involved in the care of such patients has appreciated the need for a reliable and successful technique.

The omentum is uniquely adopted for resolution of local inflammatory process, not only on account of its blood supply, but also its abundant lymphatic drainage, which reabsorbs inflammatory cell debris and macromolecular protein exudates. Omentum has well-established p lace in complex urinary tract reconstructions in general[7].

We present our experience with the treatment of supratrigonal VVF corrected with transpritoneal supravesical approach with the use of pedicled omental inter position graft.

Patients and methods:

This prospective study was conducted over eight years starting from January, 1996 to December, 2003 in the department of Surgery, Allama Iqbal Medical College / Jinnah hospital, Lahore. During this period 17 patients who presented with the diagnosis of VVF were treated with O'Conor supravesical transpritoneal technique[8].

Indications for transpritoneal repair were; indurated vaginal epithelium approximately 2cms in circumference around the fistula, fistula more than 2cm in diameter, a vault fistula with poor vaginal exposure, and fistulas involving the ureters[3,9,10].

The fistulas developed after abdominal hysterectomies in 9 patients, after prolong labour in 7 patients. In one patient VVF resulted from accidental transaction of urinary bladder during caesarian section. Of the 17 patients 5(29%) had undergone one or more previous s urgical a ttempts a t fistula repairs including one attempt in one patient 2 attempts in two patients, and 3 attempt in two patients. All the patients presented with urinary l oss t hrough v agina. O ne o ut of 17 patients (6%) had the additional symptoms of foot drop after prolonged labour. Diagnoses of fistulas were confirmed by excretory urography, cystoscopy, methylene blue test and often-retrograde pyelography. Preexisting urinary tract infections

were treated with appropriate antibiotics. Sufficient time (2 months) between the diagnosis and repair was given to allow improvement of local inflammatory changes.

The patient was given general anaesthesia and placed in low lithotomy position with legs abducted and supported in moderate Trendelenberge position. A Foleys catheter was passed per urethra. Abdomen, perineum and vagina were cleaned and draped. The peritoneal cavity was accessed through vertical midline incision. The intraoperative contents were mobilized cranially and pelvic contents were exposed with the self-retaining retractor. Intestines were packed out of way. Urinary bladder was opened along the sagital plane near the dome of bladder between stay sutures. Urinary bladder and overlying peritoneum were successively divided down to the area of fistula. Both the ureteric orifices identified and cannulated with 6F paediatrics feeding tubes for easy identification. Fistula tract was identified. Fistulous tract along with fibrotic margins were excised. Bladder was separated from vagina widely on either side. To facilitate the dissection of vesical wall a gauze ball mounted on a long forceps was introduced into the vagina so that it could be palpated in retrovesical region. The vagina was closed with inverting interrupted 2/0 polyglactin sutures in two layers in transverse fashion.

An omental pedicled flap was planed. Avascular adhesions of the omentum with transverse colon were separated. The left gastroepiploeic and short gastric vessels were divided and ligated with absorbable sutures. The greater omentum was mobilized on right gastroepiploeic artery. The hepatic flexure and ascending colon was mobilized. A routine appendicectomy was performed in each case to avoid the possibility that a subsequent appendicitis or emergency appendicectomy might compromise the immediately adjacent pedicle. The omentum based on right gastroepiploeic pedicle was passed behind the ascending colon and into the pelvis. The distal end of the omentum was stitched to the distal limits of space between vagina and urinary bladder. The ureteric feeding tubes were taken out. Urinary bladder was closed in two layers in longitudinal fashion with 2/o polygalactan sutures after passing 22F suprapubic cystostomy tube through separate stab incision. Unilateral ureterovesical reimplantation was performed in three patients to allow safer closure of fistulas, which were involving, or too close to the ureteral meatus. A 22F nelaton drain was passed in pelvis. Abdomen was closed with non-absorbable sutures after repositioning the gut into its place. Pelvic drains were removed when the output became minimal. Urethral catheter was removed 21 days after surgery.

Results:

Seventeen patients of VVF were repaired with pedicled omental graft through trans peritoneal approach during 8 years from January 1996–December 2003.

Etiological factors were, prolonged obstructive labour in 7 patients (41%), hysterectomies in 9 patients (59%), and accidental injury to bladder during caesarean section in one patient. Out of prolonged obstructed labour group 6 patients belong to younger age group (18 –23 year), seventh was 25 years old. All the patients who belong to obstructed labour group were primary Para.

Table 1

Age Group	n=
18-23 Years	6
23-28 Years	4
28-33 Years	3
33-38 Years	4

All the patients were cured of VVF at first attempt with this technique (100%) with no surgical reintervention or recurrence at last follow-up (6-90 months). One of the 17 patients (5.8%) had superficial wound infection, which was successfully treated with parental antibiotics. One out of 17 patient (5.8%) had detrusal instability, which was treated with oxybutynin. Except for minor complications of wound infection and detrusal instability success turned out to be 100% with technique of pedicled omental graft in transpritoneal repair of VVF.

Discussion:

VVF always represent devastating medical condition with profound effects on both physical and psychological health of the patient. VVF is more common in developing world and relatively uncommon in developed world[5,11]. In developed world >90% of VVF are caused by inadvertent injury to the bladder during surgery[3,12], where as in developing world >90% of VVF are caused by obstetrics complications[11,13]. In our study 47% of the VVF are due to obstetrics complications and 53% due to inadvertent injury to urinary bladder which is in between the two ends.

Women with obstetric fistula may have associated foot drop. A study from Nigeria showed that 65% of the women with obstetrics fistula currently or previously had symptoms of perineal nerve injury, including finding of foot drop[10]. At the Ethiopian fistula hospital 20% of the patients were reported to have foot drop[14]. in our study one out 17 patients (5.8%) presented with foot drop. The foot drop is thought to result from excessive compression of sacral nerve plexus by faetal head.

In most case definite cure of VVF requires surgery, in particular large VVF never resolve with conservative management[15]. Several surgical techniques have been used in the management of VVF with failure rate from 4 – 35%[5,6]. The principles of successful surgical repair are that it is tension free, water tight, and uninfected using a well vascularised flaps. Regardless of the approach used it is important to recognize that the first attempt at surgical closure has highest success rate[16].

The ideal time interval between onset of fistula and surgical repair is controversial. Some authors prefer early

intervention[17] (<3 months), while other advocate delayed (>6 months[18]) closure[19]. In general we suggest an interval 8 weeks (early closure) between the diagnosis of VVF and its repair, which is favored by many authors[9,20]. This shortens the length of hospital stay for patients and alleviates much of the morbidity endured[21,22]. Early repair doesn't appear to affect closure adversely and avoid the discomfort and psychosocial consequence of prolonged urinary leakage[9]. However, in all cases early repair is not appropriate. A longer interval should be adopted when the fistula results from radiotherapy or if there is extensive tissue damage due to infection, surgical trauma, or cellulitis. Surgical timing and route of repair are best tailored to individual patient[9].

Regardless of the approach selected, vascularised interposition flaps may be required to reinforce the repair. Some surgeons recommend the use of flaps in repairing all but the smallest fistula[23]. When the viability of the tissue used in the repair is doubtful importance of bringing well vascularised tissue into repair site is undisputed. The omentum is the preferred interposition flap in trans abdominal VVF repair. When possible we use the omental flap, which provide tissue support that allows definite closure of the path and permits mobility of the neighboring tissues. The omentum has an efficient lymphatic system which resorbes cell remnants and local exudates thus reducing the chance of infected fluid collection[7].

The trans peritoneal supravesical technique provides adequate mobilization of the bladder and vaginal wall, complete excision of fibrotic, and devitalized tissues and efficient closure of healthy layers without tension. This technique also allows safe uretero-vesical reimplantation when required, as well as mobilization of pedicled omental interposition between the vagina and bladder. These principles explain the absence of recurrence in our study. The reported success rate of VVF repair in the literature varies from 87– 96% by vaginal route[3,13], and 85– 100% by abdominal route[24,25,26] . Since we successfully repaired the fistula in all patients (100%) our study is comparable to others[18,27].

References:

1. Kremling H. Labour induced bladder injuries: historical observation" Gynakol geburtshilfliche Rundsch 1996:36 (4): 197-200.
2. Zacharin R F. Obstetric Fistula. New York, NY, Springer Verlag / Wien, 1988.
3. Eilber. Karyn Schlunt. Kavaler et al. Ten year experience with trans vaginal vesicovaginal fistula repair using tissue interposition. J. Urol. 169 (3) :1033 – 1036; March, 2003.
4. Langkilde N C, Pless T K, Lundbeck F. Surgical repair of vesicovaginal fistulae– a ten year retrospective study. Scand. J. Urol. Nephrol. 1999. April 33 (2): 100-3.
5. Goodwin W E, Scardino P T. Vesicovaginal and ureterovaginal fistula: a summary of 25 years of experience. 1980. J. Urol. 123 : 370.
6. Wein A J, Malloy T R, Carpiniello V L. Repair of vesicovaginal fistula by suprapubic transvesical approach. Surg. Gynaecol. Obst. 1980. 150 : 57.
7. Tuner-Warwick, R. T. The use of Omental pedicle graft in urinary tract reconstruction. J. Urol. 1976. 116: 341 – 347.
8. O'Conor V J, Sokol J K, Bulkly G J. Suprapubic closure of vesicovaginal fistula. J. Urol. 1973. 109: 51.
9. Blaivas, Jerry G, Heritz Dianne M, Romanzi Laun J. Early versus late repair of vesicovaginal fistula: vaginal and abdominal approaches. J. Urol. 1995. 153 (4): 1110 – 1112.
10. Waaldijk K. Elkins T E. The obstetric fistula and perineal nerve injury: an analysis of 947 consecutive patients. Intl. Urogynaecol. J. 1994. 5: 12–14.
11. Lawson, J. Vesicovaginal fistula: a tropical disease. Trans. R. Soc. Trop. Med. Hyg. 1989. 83 : 454 – 456.
12. Tancer M L. Observations on prevention and management of vesicovaginal fistula after hysterectomy. Surg. Gynaecol. Obstet. 1992. 175 (6): 501 – 6.
13. Raut V, Bhattacharya M. Vesical fistulae – an experence from developing country. J. Post Grad. Med. 1993. 39: 20-1.
14. Arrowsmith S, Hamlin E C, Wall L L. Obstructed labour injury complex : obstetric fistula formation and multifaceted morbidity of maternal birth trauma in the developing world. Obstet. Gynaecol. Surv. 1995. 51 : 568–574.
15. Lee A L, Symmonds R.E., Willium T J. Current status of genitourinary fistula. Obstet. Gynaecol. 1988. 72 : 313 – 9.
16. Elkins, T. E. Surgery for the obstetric vesicovaginal fistula: a review of 100 operations in 82 patients. Am. J. Gynaecol. 1994. 170 : 1108 –1120.
17. Blandy J P, Badenoch D F, Fowler C G, Jenkins B J. Early repair of iatrogenic injury to ureter or bladder after gynaecological surgery. J. Urol. 1991. 146 (3) 761–5.
18. Ostad M, Uzzo R G, Coleman J, young G P. Use of free bladder mucosal graft for simple repair of vesicovaginal fistula. Urology. 1998. 52 (10) 123–126.
19. O'Conor, V. J. review of an experience with vesicovaginal fistula repair. J. Urol. 1980. 123 : 367.
20. Kostakopoulos A, Deliveliotis C, Louras G, Giftopoulos A. Early repair of injury of injury to the ureter or bladder after hysterectomy. Intl. Urol. Nephrol. 1998. 30 (4): 445–50.
21. Soong, Y., Lim, P. H. Urological injuries in gynaecological practice – when is the optimal time for repair. Singapore Med. J. 1997. 38 (11) : 475 –8.
22. Waaldijk, K. The immediate surgical management of fresh obstetric fistula with catheter / or early closure. Intl. J. Gynaecol. Obstet. 1994. 45 (1) : 11 – 6.
23. Arrowsmith, S.D. genitourinary reconstruction in obstetric fistula. J. Urol. 1994. 152 : 403 – 6.
24. Sharifi Aghdas F, Ghaderian N, Payvand A. Free bladder mucosal autograft in the treatment of complicated vesicovaginal fistula. BJU Intl. 2002. 89 suppl. 1, 54 –6.
25. Mondet F, Chartier Kastler E J. Anatomic and functional results of transpritoneal – transvesical vesicovaginal fistula repair. Urology. 2001. 58 (6) : 882 –6.
26. Nesrallah Luciano J, Srougi Miguel Gittes, Ruben F. The O'Conor's technique: the gold standard for the supratrigonal vesicovaginal fistula repair. J Urol. 1999. 161(2): 566– 68.
27. Evans D H, Madjar S, Politano V A. Interposition flaps in transabdominal vesicovaginal fistula repairs : are they really necessary? Urology. 2001. 57(4):670–4.