Female Urology - Incontinence

Supratrigonal VVF Repair by Modified O’Connor’s Technique- An Experience of 26 Cases

Divakar Dalela a, Priyadarshi Ranjan b,*, Pushpa Lata Sankhwar c, Satya N. Sankhwar a, Vineet Naja a, Apul Goela a

Department of Urology, King George Medical University, Lucknow, UP, India
Department of Surgery, King George Medical University, Lucknow, UP, India
Department of Obstetrics and Gynecology, King George Medical University, Lucknow, UP, India

Abstract

Objective: To report the technical modifications of O’Connor’s procedure and their outcome in 26 supratrigonal vesico vaginal fistulae.

Materials and methods: Twenty-six cases of supratrigonal VVF (17 primary, 9 recurrent) were operated using the described modifications. It consisted of approaching the bladder transperitoneally, without dissecting the retropubic space, making a short sagittal or parasagittal cystotomy in between stay sutures, liberal use of bladder rotation flaps instead of midline closure, using single layer, continuous, closely placed, interlocking stitches for bladder as well as vaginal approximation and universal use of vascularised tissue interposition.

Results: Mean fistula size was 2.8 cm (range 1.0 to 3.7). Mean operative time was 104 minutes, and blood loss was insignificant. Three patients required ureteroneocystostomy. All patients were dry after 2–3 weeks of suprapubic and per urethral catheter drainage. One patient persisted with stress urinary incontinence. No patient on follow up complained of features suggestive of prolonged ileus, peritonitis or adhesive intestinal obstruction.

Conclusion: Modified O’Connor’s repair is safe and achieves excellent functional results. It requires a shorter cystotomy instead of bi-valving of the bladder, thus minimizes tissue trauma, intraoperative blood loss and operating time. It also gives option of tailoring the cystotomy in sagittal or parasagittal line, according to the site and size of the fistula, and thus permits closure of fistula by rotation of bladder flap into the defect without any lateral traction on the bladder edges. Retropubic dissection and drainage of the retropubic space is also not required.

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* Corresponding author. Sector-20, house-no-25, Indira Nagar, Lucknow, UP 226016, India. Tel. +91 9352211703. E-mail address: priyadarshiranjan@sify.com (P. Ranjan).

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1. Introduction

Vesicovaginal fistula (VVF) is a distressing disease with social, hygienic, urological, and psychosexual consequences. Supratrigonal VVF results from a variety of causes—rarely considered in the past to see iatrogenic fistula, while in developing world obstetric etiology prevails. In the west, 90% cases are caused by inadvertent trauma to the bladder during surgery [1]. Hysterectomy accounts for 75% of such fistulae [2]. Recent meta-analysis by Gilmour suggests that iatrogenic bladder injury occurs in 10.4 per 1000 cases [3].

In developing countries, such fistulae often result following caesarean section for prolonged/complicated obstructed labour where a combination of surgical trauma and ischemia (caused by fetal head compression) jointly contribute to the occurrence of fistula. The variations in the degree of ischemic damage and resultant fibrosis have forced surgeons to modify their techniques to achieve the best results [4].

The O’Connor operation has been the most accepted method of repairing such supratrigonal VVF till date. The traditional O’Connor’s technique utilizes suprapubic access for extra-peritoneal dissection of the retropubic space to dissect the urinary bladder, followed by long sagittal cystotomy (bi-valving the bladder) carried till the fistula (Fig. 1). The fistulous tract is then excised followed by two-layered closure after tissue transposition in between the vaginal and the bladder walls. Herein we describe our modifications of the O’Connor technique for repairing a supratrigonal VVF using the trans peritoneal approach.

Fig. 1 – Traditional O’Connor’s procedure involves a long cystotomy coursing through the anterior wall and dome of the bladder (bi-valving).

2. Materials and methods

Twenty-six patients (17 primary, 9 recurrent) admitted between January 2000 to June 2004 with supratrigonal VVF were operated using these modifications. The interval between the onset of leakage and final surgical correction ranged from 6 weeks to 8 years (median 10 weeks). A detailed medical history was recorded focusing on the cause of fistula and previous attempts at repair. None of the patients had received pelvic irradiation. Two cases had vesical calculus, which was removed by transurethral cystolitholapaxy 2–3 weeks prior to definitive closure. Both these patients had an obstetric fistula. Prior stone removal eliminates the potential source of infection and mucosal edema of the bladder and thus provides optimal bladder tissue for healing of the fistula [5]. We prefer transurethral cystolitholapaxy for such stones owing to its minimally invasive nature and the ability to break even large stones [5].

Vaginal assessment was done to inspect and palpate the vaginal opening of the fistula. Any local genital infection was treated before surgery. Cystoscopy was done to establish the supratrigonal location of the fistula and assess its proximity to the ureteric orifices. An excretory urogram was performed in selected patients where ureteric orifices were too close to VVF. One patient had bilateral and 2 patients had unilateral ureteric orifice involvement.

For this procedure, the patient is placed in trendelenberg position. The abdomen is opened via an infraumbilical midline/Pfannenstiel incision. The peritoneum is opened to approach the posterior surface of bladder. The bowel is gently packed with sponges before the cystotomy and effective suction is used to minimize urinary spillage. To elevate the posterior bladder wall, full thickness stay sutures are placed, using 0 chromic catgut, at the lower end of posterior wall of the bladder. An 18F Foley catheter is put in the bladder perurethrally, prior to placement of stay sutures, and the balloon is inflated up to 40–50 cc. It facilitates the perception of thickness of posterior bladder wall while placing full thickness stay sutures and at the same time prevents entrapment of anterior bladder wall. A short cystotomy beginning about 2–3 cms away from cul-de-sac is made in between these stay sutures, limited to the posterior bladder wall (Fig. 2). Routinely we use three fine malleable daever retractors to enhance the intra vesical visibility by appropriate retraction within the cystotomy. The shorter cystotomy does not compromise vision.

The proximity of the ureteric orifice to the VVF is assessed at this stage and only in those cases where orifice sits close to the fistula edge, a 5–6 Fr infant feeding tube is passed into the ureters before fistula dissection is commenced. As the dissection progresses towards and around the fistula, additional stay sutures are placed along the edges of the cystotomy at mirror image locations. These stay sutures later on act as guide for approximation of cystotomy edges. Apart from providing effective anchorage to lift up the posterior bladder wall, they also minimize oozing from the cystotomy edges, and are thus haemostatic.

In a small fistula, the cystotomy is extended to encircle the fistula and excision of the fistula is done as the traditional
technique. If the fistula is large (>2.5 cm), the cystotomy is directed in parasagittal line towards one side of the fistula (Fig. 3). It leads to formation of a flap of bladder wall after the fistula is excised (Fig. 4). This flap is subsequently rotated to close the bladder wall defect (Fig. 5). Complete excision of the fistula is done and the plane between bladder and vaginal wall is dissected as in traditional O’Connor’s procedure. This method of bladder closure ensures a tensionless suture line (Fig. 6). The vaginal wall is closed in single layer with continuous interlocking, closely placed stitches using either 1/0/2/0 polyglycaprone (monocryl) or polyglactin (vicryl) in a transverse line. Greater omentum is mobilized and is anchored to anterior vaginal wall to completely cover the vaginal suture line. In 2 patients, where omentum was considered insufficient, paravesical peritoneal flaps were used for interposition. The urinary bladder is also closed in single layer using 3/0 polyglycaprone or polyglactin by continuous interlocking, closely placed stitches. Suprapubic cystostomy (SPC) and per urethral catheters are placed to drain the bladder and the cystotomy is closed. The SPC is extraperitonealized and the laparotomy wound is closed in layers. No drain is placed routinely.

The suprapubic catheter is removed after 2 weeks and the per urethral catheter is removed after 3 weeks. The patients...
are advised for sexual abstinence for 3 months. All patients were advised to void at frequent intervals to prevent overdistension of the bladder. Patients desiring future pregnancy were advised strict antenatal monitoring, regular follow up in the antenatal clinic and elective caesarean section.

3. Results

Mean age of our patients was 21.4 (range-18 to 41) years. Four patients had fistula after hysterectomy (2-transvaginal hysterectomy and 2 transabdominal), while 22 patients had a VVF following manipulations for obstructed labour. Twenty out of 22 patients who had obstructed labor were short statured (height less than 5 feet). Nine patients had recurrent VVF, following previous attempts at repair. Four out of them had undergone transvaginal repair and 5 were treated transabdominally at peripheral centers (no records were available). One case had developed VVF 8 years earlier and had undergone three previous failed attempts at repair, twice vaginally and once transabdominally. Mean fistula size was 2.8 cm (range 1.0 to 3.7). Three fistulae were encroaching the ureteric orifice and they required additional ureteroneocystostomy. Eighteen patients had a larger fistula (>2.5 cm) and were managed using parasagittal cystotomy. All of them achieved tensionless closure using the above technique. It was possible to interpose greater omentum in 24 cases whereas in 2 patients the omentum was small and atrophic hence vascularised paravesical peritoneal flap was used.

Transurethral cystolitholapaxy was done in 2 patients having vesical calculi 2–3 weeks prior to VVF closure. Thus the bladder wall edema associated with stone was negligible at the time of repair and local tissue vitality was good.

Mean operative time was 104 minutes, intraoperative blood loss was insignificant and none of the patients required postoperative blood transfusion.

All patients were dry after 2 weeks of suprapubic and per urethral catheter drainage. The patients were followed up regularly in our out patients department, and were largely asymptomatic except some irritative lower urinary tract symptoms in 6 cases which settled spontaneously in 4–6 weeks. Postoperative micturating cystogram was done only in selected patients to document dryness. Since majority of our patients were young (mean age-21.4 years) and were desirous of future pregnancy all patients were advised caesarean section. Four patients became pregnant and had a successful outcome of pregnancy by elective caesarean section, with no resultant urological inirmitry. Only 1 had stress urinary incontinence associated with urethral incompetence. She later on underwent colposuspension and was relieved. Laparotomy wound was infected in 1 patient, which healed by secondary intention. No patient on follow up complained of features suggestive of adhesive intestinal obstruction, prolonged ileus or peritonitis. Only 21 patients reported for follow up after 1–5 years and they were urologically asymptomatic and continent. Three patients had dysparaunia prior to surgery, possibly due to previous surgery, which was not relieved.

4. Discussion

O’Connor’s technique is advocated as the gold standard technique for managing supratrigonal VVF [10]. Traditional technique described by O’Connor involves extraperitoneal approach to the urinary bladder [11]. It involves dissection of the urinary bladder extraperitoneally in the retropubic space. A longitudinal cystotomy is made on the anterior wall of bladder, which is advanced, coursing through the dome of the bladder, backwards towards the fistula. It results in a long cystotomy which almost bivalves the bladder. The vaginal wall is closed in 2 layers and a vascularised tissue is often interposed in between before the closure of bladder. It can be local pelvic tissue, retro pubic fat or the greater omentum after opening up the peritoneal cavity. Recently use of free grafts has also been described [12]. Ureteric catheters are placed and the bladder is closed over...
suprapubic and per urethral catheters. A drain is put in the retropubic space.

The modifications, we used in our patients consisted of approaching the bladder transperitoneally (without doing any dissection in retropubic space), which provides quick access to the posterior wall of the bladder. Stay sutures provide effective anchorage to lift up the posterior wall and minimize the oozing from the cystotomy edges. The cystotomy is very small and avoids classical bivalving of the bladder, which accounts for increased blood loss and prolonged operative time. Some people have even speculated its role in enhancing postoperative voiding dysfunction and reflux [12].

It is also possible to direct the cystotomy in parasagittal line if the fistula is large and medial side of the bladder may be rotated as a flap into the bladder defect. Thus, it minimizes the traction on the lateral edges of the bladder defect, which is inevitable when such a large fistula is closed using sagittal cystotomy. The fistulous edges are excised and the closure of both vaginal as well as bladder defect is done in single layer using closely placed interlocking stitches. We prefer to use polyglecaprone (monocryl) for this purpose as it glides through the tissues without any abrasive effect. Approaching the urinary bladder directly through the peritoneum has not added to peritonitis, adhesive intestinal obstruction or prolonged ileus, instead it allows an early inspection of omentum and offers a wider field of vision for the surgeon. The urinary spillage is negligible and of no consequence. A table enumerating the advantages and disadvantages of our modifications is enlisted (Table 1). We prefer to use omental interposition in all patients. In case it is short or atrophic we have used paravesical fat/peritoneal flap.

Our approach has given us 100% success in terms of achieving continence. Ever since transabdominal approach to VVF has been described, [13] continuous refinements in the technique have given better results. Several surgical techniques have been used in these cases with failure rates ranging from 4 to 35% [14,15]. Nesrallah LJ evaluated the success rate of transperitoneal O’Connor’s procedure to be 100% [10] and consider it to be the gold standard for supratriagonal fistulae. In a series of 23 VVF, Cetin concluded that the fistulas located above the interureteric ridge and fistulas encroaching the ureteric orifices, were good candidates for suprapubric approach [16]. In a series of 68 VVF, Motiwala and colleagues attributed the success of transvesical technique to simple access, construction of a vascularised flap and utilization of vicryl suture [17]. A recent review by Huang has emphasized the importance of individually tailoring the technique and approach for each fistula [18]. Regardless of whether a transabdominal or transvaginal approach is selected, the concepts of using healthy tissue, tension free closures and reinforcing the closures in high risk situations will ensure success nearly in all times. Transabdominal-transvesical approach is the preferred method of managing large supratriagonal VVF [6,7]. Mondet evaluated the anatomic and functional results of transperitoneal-transvesical fistula repair and concluded that it to be the reference treatment for complex supratrigonal VVF [8]. Leng and coworkers also reported that limited transvesical repair of uncomplicated supratrigonal VVF offers reliable success with minimal morbidity and hospital stay comparable to the transvaginal approach [9]. Recently laparoscopic VVF repairs are gaining importance [19]. Consensus is emerging that laparoscopic repair of VVF is feasible and efficacious. The modified O’Connor’s approach as described by us may be adopted in laparoscopic surgery as well.

5. Conclusion

Vesicovaginal fistulas represent a distressing urological condition for the patient and demand meticulous skilled surgical attention [20,21]. We
have suggested some modifications to the original technique of O’Connor’s repair by approaching the fistula transperitoneally, making a smaller cystotomy limited to the posterior wall, liberal use of stay sutures to enhance exposure and reduce bleeding, using parasagittal cystotomy in large VVF’s and totally avoiding retropubic dissection and drain. These modifications have minimized intraoperative blood loss and operating time without compromising the exposure and ultimate outcome. Since the retropubic space is not disturbed, it leaves the option for subsequent SUI surgery. The modifications are simple to understand and easily practicable.

References