



Medical Sciences

LAPAROSCOPIC APPROACH TO VESICOVAGINAL FISTULA: OUR EXPERIENCE

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Abstract

Introduction: Most Vesicovaginal fistulas in the industrialized world are iatrogenic, Though they may also result from congenital anomalies, malignant disease, inflammation and infection, radiation therapy, iatrogenic (surgical) or external tissue trauma, ischemia, parturition and a variety of other processes. Vesicovaginal fistulas (VVF) represent, by far, the most common type of acquired fistula of the urinary tract. The goal of treatment of these fistulas is the rapid cessation of urine leakage with return of normal and complete urinary and genital function.

Materials and Methods: Female patients presenting with iatrogenic Vesicovaginal fistula formed the study group. A detailed history and physical examination was carried out. Imaging included intravenous urogram, cystogram, computerised tomography, MR imaging and retrograde ureterogram as felt necessary. Surgical repair of Vesicovaginal fistula was carried out through a laparoscopic approach.

Results: 24 women presented with VVF, of these 19 underwent laparoscopic transperitoneal repair, whereas 5 underwent laparoscopic transvesicoscopic repair. The intraoperative blood loss was minimal (< 100 ml) and no major perioperative complications were noted.

Conclusions: Minimally invasive approaches to repair vesico-vaginal fistulas are feasible, safe and associated with minimal blood loss, hospital stay and morbidity.

Keywords: Laparoscopy, Minimally invasive, Vesicovaginal fistula

Introduction

Today most Vesicovaginal fistulas in the industrialized world are iatrogenic, however they may also result from congenital anomalies, malignant disease, inflammation and infection, radiation therapy, iatrogenic (surgical) or external tissue trauma, ischemia, parturition and a variety of other processes. Classification is generally based on the organ of origin in the urinary tract and the termination point of the fistula (e.g. vagina, skin). The presenting symptoms and signs are variable and depend to a large degree on the involved organs, the presence of underlying urinary tract obstruction or infection, the size of the fistula and the associated medical conditions (e.g. malignant neoplasm). Vesicovaginal fistulas represent, by far, the most common type of acquired fistula of the urinary tract¹.

Since Vesicovaginal fistulas are almost universally unexpected they usually result in a great deal of inconvenience, discomfort, and physical disability for the affected individual. Considerable emotional and psychological distress often accompanies the diagnosis and subsequent treatment. Nevertheless, minimizing the patient's discomfort, maintaining a positive and honest physician-patient relationship while providing constant reassurance, and, perhaps most important, pursuing expeditious and successful

treatment of the fistula will most often result in a satisfactory, nonconfrontational, mutually satisfying long-term outcome. Although some Vesicovaginal fistulas will heal with conservative management surgery often assumes a role in the definitive repair. Repair and reconstruction of Vesicovaginal fistulas are sometimes complex. These need to be approached on an individual case by case basis as repair may involve some innovative and even improvisational manoeuvres in the operating room. Principles of surgical management of Vesicovaginal fistula include adequate exposure with debridement of devitalized and ischemic tissue, removal of involved foreign bodies or synthetic materials from the region of fistula, careful dissection or anatomic separation of the involved organ cavities, watertight closure, use of well vascularised healthy tissue flaps for repair, multiple layer closure, tension-free non-overlapping suture lines, adequate urinary tract drainage or stenting after repair, treatment and prevention of infection and maintenance of hemostasis².

Minimally invasive approaches to Vesicovaginal fistula repair would be ideal. Laparoscopic approaches to Vesicovaginal fistula (VVF) have been reported³⁻⁶. It is unclear whether the laparoscopic approach offers any distinct advantages. We report our experience with laparoscopy in the management of Vesicovaginal fistulas.

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Materials and Methods

Female patients presenting with iatrogenic VVF and referred to Dept of Urology for further management formed the study group. A detailed history was noted and physical examination done. All patients underwent three swab test, followed by ultrasonography examination of the urinary system. Urine was sent for detail examination and culture. Patients were put on antibiotics. Imaging studies were done as and when felt necessary, which included Intravenous urogram, Cystogram, Magnetic resonance imaging and computerized tomography. All patients underwent cystoscopy examination to note the number, size, relation to ureteric orifices and surrounding area of the fistula. Vaginoscopy was done at the same time to note the fistula opening.

All laparoscopic procedures were done under general anaesthesia with the patient in modified lithotomy position. In most cases of Vesicovaginal fistula (VVF), a transperitoneal access was gained using a 10 mm umbilical port for the telescope and two or three 5 mm working / instrument ports placed laterally and inferior to the umbilicus. An Harmonic scalpel and/or bipolar cautery was used for dissection and haemostasis. The bladder was dissected free from the vagina up till the level of the fistula. The posterior bladder wall was incised vertically in proximity of the VVF. Once the communication between the bladder and vagina became evident, the fistulous tract was excised, creating a lateral margin of viable tissue wide enough to allow subsequent closure. The rent in the bladder and vagina were closed separately and healthy omentum was interposed in-between these two. Bladder was closed using 3/0 vicryl and the vagina was repaired using 2/0 vicryl.

In the last three years we have been using the transvesicoscopic route to repair Vesicovaginal fistulas. The bladder was fixed to the anterior abdominal wall using a suture loop technique under cystoscopic guidance. A 5 mm endoscopic port was placed into the bladder under cystoscopic guidance in the midline halfway between the umbilicus and pubic symphysis. Two more 5 mm working/instrument ports were placed 5 cm laterally and inferior to the endoscopic port on either side. The vagina was packed with betadine packs so as to prevent gas leak. The fistula was inspected, a circum fistula incision was made and the bladder dissected away from the underlying vagina. The edges of the fistula were excised. Once adequate dissection was achieved, the vagina was sutured vertically and the bladder edges sutured horizontally. The port sites were closed at the end of the procedure under cystoscopic guidance. The bladder was catheterized at the end of the procedure.

Post-operatively the patients were observed for urine output as well as urinary leak through drain and vagina. Patients were put on anticholinergics to reduce

the chance of pericatheter leak. All patients were followed up. Imaging (ultrasonography, Intravenous urography, cystography, MR Urography) were done as felt appropriate to note the healing of the fistula.

Results

During the period Jan 2002 to Dec 2009, 36 female patients were referred to the Dept. of Urology for management of iatrogenic urogynecologic fistula. Of these 24 had Vesicovaginal fistula (VVF), 7 had ureterovaginal fistula (UVF) and 5 had vesicouterine fistula (VUF).

Of the 24 women presenting with Vesicovaginal fistula, 18 had undergone abdominal hysterectomy, 4 had undergone vaginal hysterectomy and 2 had undergone uterine myomectomy. Conservative treatment with a period of catheterization was earlier attempted by the treating gynaecologist. On failure of conservative means, these patients were referred for further management. All these patients were taken up for laparoscopic repair only after a period of 12 weeks after initial surgery. Three swab test, cystogram and/or MR imaging confirmed the lesion. Cystoscopy revealed a single supra trigonal fistula in 22, whereas two patients had two fistulas close to each other. Laparoscopic transperitoneal repair was carried out in 19 patients and transvesicoscopic repair in the remaining five. None of the patients needed perioperative blood transfusions. The mean blood loss was 80 ml and the mean operating time was 165 min. No major intra-operative or post-operative complications were noted in any patient. Subcutaneous emphysema was noticed in one patient undergoing transvesicoscopic repair. Two other patients had prolonged ileus. The catheter was removed on the 8th post-operative day. Three swab test, cystogram and cystoscopy done 6 weeks later confirmed healing of the fistula. Mean follow-up period was 39 months and none of the patients had recurrence of symptoms.

The mean hospital stay was 5.4 days in all these 24 patients. None of these patients needed perioperative blood transfusions and the mean analgesic requirement was < 150 mg of Inj. diclofenac sodium given in divided doses. The patients were mobile within 12 hours and started orally within 18 hours.

Discussion

Vesicovaginal fistula (VVF) is the most common acquired fistula of the urinary tract¹, and has been known since ancient times. The etiology of VVF differs in various parts of the world. In the industrialized world, the most common cause (>75%) of VVF is injury to the bladder at the time of gynaecologic, urologic or other pelvic surgery^{7,8}. The rate of iatrogenic bladder injury during abdominal hysterectomy is estimated to be

between 0.5% and 1%⁹. The incidence of fistula after hysterectomy is estimated to be approximately 0.1% to 0.2%¹⁰. In the developing world, where routine perinatal obstetric care may be limited, VVF most commonly results from prolonged obstructed labor due to cephalopelvic disproportion, with resulting pressure necrosis to the anterior vaginal wall, bladder, bladder neck, and proximal urethra from the baby.

Laparoscopy has become increasingly popular in urology, reducing the invasiveness of treatment and shortening the period of convalescence. Laparoscopic surgery offers the patient less morbidity and quicker recovery than the traditional open surgery. Nezhath et al³ first reported the laparoscopic repair of a Vesicovaginal fistula (VVF), and later assessed the laparoscopic closure of intentional and unintentional bladder lacerations in a series of 20 cystotomies. Von Theobald et al⁴ used an omental J-flap interposition during the laparoscopic repair of VVF. Nagraj et al¹¹ reported on their series of 13 patients who underwent transperitoneal laparoscopic repair of VVF. They followed the same principles as in open surgery. The surgery was successful in all and they concluded that laparoscopic approach was less morbid and equally effective as compared to open surgery. Similarly Otsuka et al¹² retrospectively reviewed their experience with laparoscopic approach for VVF. Seven women (age 37 to 74) underwent laparoscopic approach for repair of VVF. Conversion to open was necessary in one patient due to prolonged operating time. They reported that laparoscopic repair of VVF was safe and provided excellent results.

Robotic surgery with its numerous advantages over conventional laparoscopy has assumed an ever expanding role in pelvic and pelvic floor reconstructive surgery. Melamud et al¹³ reported the first case of robotic assisted laparoscopic repair in a 44 year old woman who presented with VVF following vaginal hysterectomy. Sundaram et al¹⁴ reported on a case series of five patients who underwent robotic assisted laparoscopic repair of VVF. Their data showed that robot assisted VVF repair was feasible and resulted in lower morbidity, shorter hospital stay and quicker recovery. Hemal et al¹⁵ reported their experience with robotic reconstruction for recurrent supratrigonal VVF and concluded that robotic repair provided excellent results. Louis and Sharon¹⁶ reviewed the literature regarding robotic use in urogynecologic surgery and reported that feasibility and safety of performing robotic urogynecologic procedures was well demonstrated. They further stated that the role of robotics in urogynecologic procedures will continue to grow, as there was an increasing access to the robotic platform.

Our series of 24 patients demonstrates that laparoscopic approaches are feasible in treating Vesicovaginal fistulas. The operative morbidity is less,

blood loss is minimal and postoperative pain / need of analgesics is less. Overall the approach is safe and associated with good and reliable results.

Conclusions

The presenting symptoms and signs of urogynecologic fistulas are variable and depend to a large degree on the size of the fistula. The goal of treatment of vesico-vaginal fistulas (VVF) is the rapid cessation of urine leakage with return of normal and complete urinary and genital function. Minimally invasive approaches to repair of these Vesicovaginal fistulas would be ideal. Laparoscopic approaches are feasible, safe and are associated with minimal morbidity, blood loss and hospital stay.

References:

1. Gerber GS, Schoenberg HW: Female urinary tract fistulas. *J Urol* 1993; 149:229-236.
2. Rovner ES. Urinary tract fistula: in Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA. Ed Campbell-Walsh Urology, 9th ed, Saunders Elsevier, Philadelphia 2008; p 2323
3. Nezhath CH, Nezhath F, Nezhath C, Rottenberg H: Laparoscopic repair of a vesicovaginal fistula: A case report. *Obstet Gynecol* 1994; 83(pt 2):899-901.
4. von Theobald P, Hamel P, Febraro W: Laparoscopic repair of a vesicovaginal fistula using an omental J flap. *Br J Obstet Gynaecol* 1998; 105:1216-1218.
5. Miklos JR, Sobolewski C, Lucente V: Laparoscopic management of recurrent vesicovaginal fistula. *Int Urogynecol J Pelvic Floor Dysfunct* 1999; 10:116-117
6. Ou CS, Huang UC, Tsuang M, Rowbotham R: Laparoscopic repair of vesicovaginal fistula. *J Laparoendosc Adv Surg Tech A* 2004; 14:17-21.
7. Lee RA, Symmonds RE, Williams TJ: Current status of genitourinary fistula. *Obstet Gynecol* 1988; 72(pt 1):313-319.
8. Tancer ML: Observations on prevention and management of vesicovaginal fistula after total hysterectomy. *Surg Gynecol Obstet* 1992; 175:501-506.
9. Keettel WC, Sehring FG, deProse CA, Scott JR: Surgical management of urethrovaginal and vesicovaginal fistulas. *Am J Obstet Gynecol* 1978; 131:425-431
10. Harris WJ: Early complications of abdominal and vaginal hysterectomy. *Obstet Gynecol Surv* 1995; 50:795-805.
11. Nagraj HK, Kishore TA, Nagalaxmi S: Early laparoscopic repair for supratrigonal Vesicovaginal fistula. *Int Urogynecol J* 2007; 18:759-762

12. Otsuka RAP, Amaro JL, Tanaka MT, Epacagnan E, Mendes JB, Kawano PR, Fugita OEH. Laparoscopic repair of Vesicovaginal fistula. J Endourol 2008;22:525
13. Melamud O, Eichel L, Turbow B, Shanberg A. Laparoscopic Vesicovaginal fistula repair with robotic reconstruction . Urology 2005;65:163-168
14. Sundaram BM, Kalidasan G, Hemal AK. Robotic repair of Vesicovaginal fistula: Case series of five patients . Urology 2006;67:970-973
15. Hemal AK, Kolla SB, Wadhwa P. Robotic reconstruction for recurrent supratrigonal Vesicovaginal fistulas. J Urol 2008;180:981-985
16. Louis MM, Sharon B. Role of robotic surgery in urogynecologic surgery. Curr Opinion Urol 2010;20:70-74.