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Laparoscopic uterus preserving repair for vesicouterine fistula: Feasibility and outcome

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Abstract
Objective: The purpose of this study is to study the feasibility and outcome of laparoscopic uterus preserving repair of vesicouterine fistula in female patients presenting with urinary incontinence and gross cyclical hematuria following a cesarean delivery.
Materials and Methods: It was a retrospective study that included 5 patients of vesicouterine fistula admitted to our hospital. The patients were given a conservative trial before taking up them for surgical repair. Laparoscopic repair was performed 6 months after the cesarean delivery. Uterus was preserved in all cases.
Results: The average operative time was 130.6 minutes. There were no major perioperative complications. The average hospital stay was 3.6days. There was no failure and patients were made catheter free after 14 days of surgery. Two of our patients had conceived and successfully completed pregnancy after repair of fistula.
Conclusion: Laparoscopic uterus preserving repair of vesicouterine fistula appears to be feasible procedure with good results.

Keywords: Cyclical hematuria, uterus preserving technique, vesicouterine fistula

Introduction
Vesicouterine fistula is an abnormal communication between the urinary bladder and the uterus. Though it is still considered as the least common urogyneacological fistula, but its prevalence has been increasing in parallel with the rising number of lower segment cesarean sections performed worldwide [1]. Until 1986 Tancer reported 74 cases, and now lower segment cesarean section still remains the most common cause of vesicouterine fistula [2]. Besides cesarean section the other causes of vesicouterine fistula are induced abortion, hysterectomy, dilation and curettage and ruptured uterus during obstructed labor. In rare instances placenta percreta, displaced intrauterine device, uterine artery embolization, brachytherapy, and traumatic bladder catheterization have all been reported to cause vesicouterine fistula [2, 3, 4, 5, 6].
Vesicouterine fistulae may or may not manifest with continuous urinary incontinence because of the sphincter-like activity of the cervix; the exception is in the setting of an incompetent cervix wherein urinary leakage is constant. It may manifest as menouria and cyclic hematuria in the setting of urinary continence [7]. Diagnosis is confirmed by cystoscopy and radiological studies. Cystoscopy usually reveals a midline defect in the posterior wall of bladder and communication can be confirmed by passing a guide wire from bladder and retrieving it from uterus. A cystogram usually reveals a communication in posterior wall of bladder with filling of contrast in uterine cavity in lateral view. Intravenous urography is done to exclude associated upper tract injuries. Some of vesicouterine fistulas heal spontaneously following prolonged catheterization or hormonal manipulation, but surgical management remains the definitive treatment for most of the cases [2] Laparoscopic repair of these fistulas with preservation of uterus has been reported and it offers the advantage of minimal access surgery along with preservation of fertility. The aim of this study is, to study the feasibility and outcome of laparoscopic uterus preserving repair of vesicouterine fistula in females.

Material and Methods

This was a retrospective study that included all patients of uterovesical fistula that were admitted to our institute. The demographic profile of the patients was recorded. The presenting complaint and etiology of fistula was noted (Table-1). Cystogram and intravenous urography was performed in all patients to detect the fistula and rule out associated upper tract injuries. The diagnosis was confirmed by rigid cystoscopy under spinal anesthesia. In case of obvious fistula guide wire was passed from the bladder and retrieved from uterus to confirm the communication. In two cases guide wire could not be negotiated and methylene blue was injected into uterine cavity and fistula confirmed by efflux of dye into bladde (Figure-1).

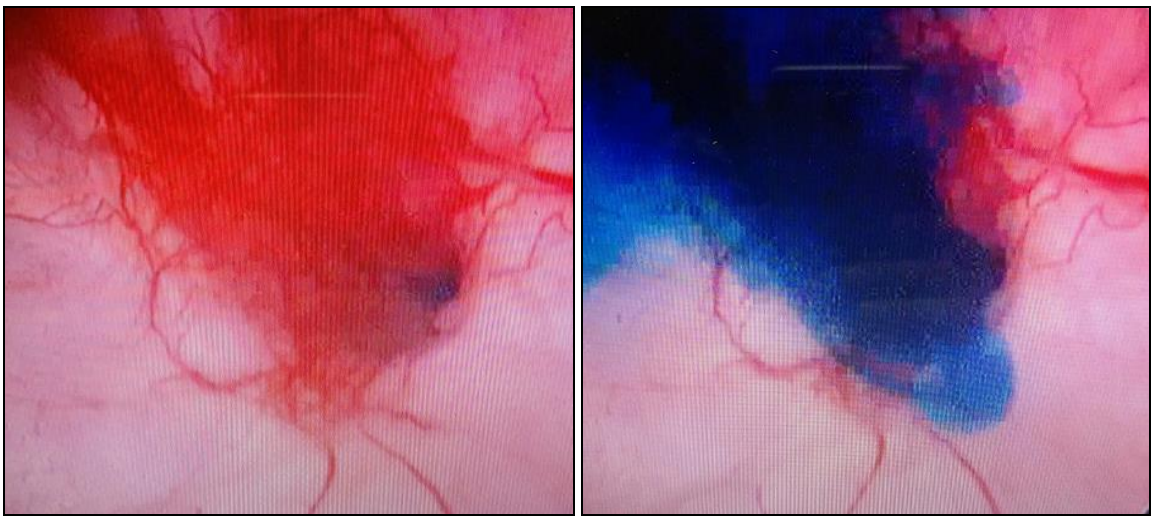

Fig-1: (A- cystoscopic view of vesicouterine fistula, B- efflux of methylene blue via fistula)

All patients were given a conservative trial of catheterization and hormone manipulation by oral contraceptive pills to induce amenorrhea. After 6 months of treatment none of the patient improved and surgical treatment was undertaken. All cases were repaired laparoscopically. The patientr were placed in the low lithotomy position along with Trendelenburg tilt. Cystoscopy was done and both ureteric orifices were cannulated with ureteric catheters. The omental adhesions in the pelvis were carefully released and the peritoneum between the bladder and uterus was incised. The plane between uterus and bladder was developed by sharp and blunt dissection. The fistula was identified by the previously placed guide wire (Figure-2).

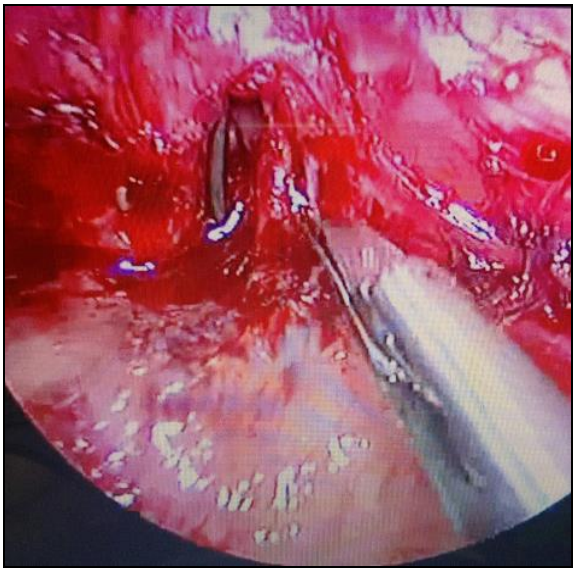

Fig 2: Fistula with guide wire across

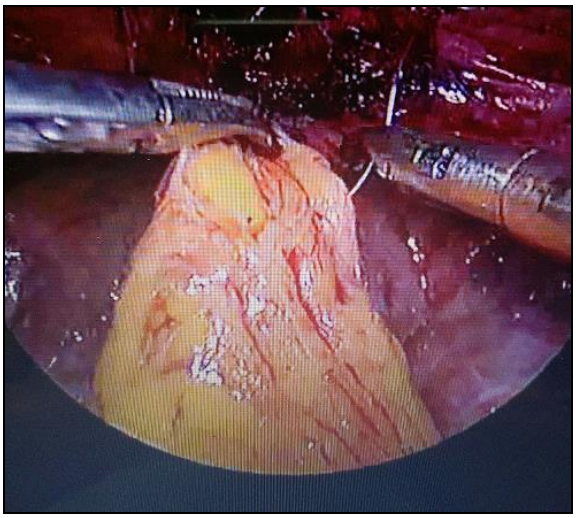

Fig 3: Omentum used to cover the repair

The margins of fistula were freshened and uterine defect closed by vicry 2-0 by free hand intracorporeal suturing. Omentum was brought down and sutured to cover the repair (figure-3). Then defect in bladder was repaired by vicryl 2-0 in single layer. A drain was left in pelvis and per urethral catheter was placed. Drain was removed on postoperative day second and ureteric catheters were removed on postoperative day 3. Patients received intravenous antibiotics (Ceftriaxone and amikacin) along with oral tolterodine 4mg daily in postoperative period. A cystogram was done 14 days after surgery and catheter was removed when integrity of bladder was confirmed. Patients were kept on oral contraceptive pills for 6 months following surgery. Two patients after conception were kept on follow up of urologist as well as obstetrician till cesarean delivery.

Results

There were total 5 patients that were diagnosed with uterovesical fistula. The average age of patients was 32.6 years. Three of the patients had previous caesarian deliveries and two were primipara. Continuous urinary incontinence following cesarean section was the chief complaint in four cases while cyclical hematuria was presenting symptom in one case. The cases were confirmed by cystoscopy and cystography. All cases were given a conservative trial by prolonged catheterization and oral contraceptive pills before taking them up for surgery. All cases were repaired laparoscopically and uterus was preserved. The average operative time was 130.6 minutes. None of patients had any major complication. The average hospital stay was 3.6 days.

Table 1: Demographic profile of patients with presenting symptoms

Patien no.	Age in years	Etiology	Presenting Symptoms	Duration of conservative management
1	35	Cesarean section	Continuous Incontinence	4 weeks catheterization with hormone therapy for 6 months
2	38	Cesarean section	Continuous Incontinence	6 weeks catheterization with hormone therapy for 6 months
3	28	Cesarean section	Continuous Incontinence	4 weeks catheterization with hormone therapy for 5 months
4	36	Cesarean section	Continuous Incontinence	4 weeks catheterization with hormone therapy for 6 months
5	26	Cesarean section	Cyclical hematuria	6 weeks catheterization with hormone therapy for 6 months

The catheter was removed after 14 days following normal cystogram. Two of our patients conceived after 1 year and 1. 7 years following surgery and completed their pregnancies. Both babies were delivered by elective cesarean section (Table-2).

Table 2: Babies were delivered by elective cesarean section

Patient no.	Surgical procedure	Operative time	Hospital stay	Complications	Conception
1	Laparoscopic uterus preserving	130 min.	4 days	nil	Nil (on contraceptive pills)
2	Laparoscopic uterus preserving	128 min.	3 days	nil	Nil (on contraceptive pills)
3	Laparoscopic uterus preserving	135 min.	4 days	nil	1.7 years after surgery
4	Laparoscopic uterus preserving	120 min.	4 days	nil	Nil (on contraceptive pills)
5	Laparoscopic uterus preserving	140 min.	3 days	nil	1 year after surgery

Discussion

Though a rare urogynecologic fistula, the prevalence of vesicouterine fistula is on rise in parallel with the increase in number of cesarean sections performed worldwide. The only cause of fistula in our study is cesarean section. Repeated cesarean section poses greater risk of fistula due to progressive devitalisation and scarring [1]. It can present as continuous incontinence, cyclical hematuria, menouria, infertility or hematuria [7]. Most common presentation in our study was continuous urinary incontinence. Diagnosis is confirmed by combined cystoscopy radiological studies (Cystogram). Treatment options for vesicouterine fistula include conservative, medical and surgical treatments. Spontaneous resolution of vesicouterine fistula has been reported in literature and these authors recommend delayed repair of these fistulae as many of them can resolve spontaneously [8]. Small immature fistulas can be treated by prolonged catheterization alone or fulguration of the tract followed by prolonged catheterization [9]. In our study all surgical repairs were done six months following cesarean section and after the failure of the fistula to close following catheterization for 4 weeks. Medical management consists of hormonal manipulation by oral contraceptive pills or by luteinizing hormone –releasing hormone analogues to induce involution of the puerperal uterus that results in the closure of fistula [10]. The mature fistulas older than 6 weeks usually don't respond to hormonal manuplation [11]. Our patients had received oral contraceptive pills for 6 months before surgical intervention was undertaken to repair fistula.

Surgical treatment is considered as the definitive treatment for vesicouterine fistula and it depends on the reproductive wishes of the patient as well as other surgical factors [12]. Transabdominal hysterectomy with bladder closure can be done in patients who don't have the reproductive wish. Uterus preserving surgery is usually considered for the patients who want to preserve their fertility. Removal of uterus in young females is a psychological trauma. Laparoscopic and robotic assisted repair of this fistula has been reported [13]. We had repaired all the 5 cases of uterovesical fistula by laparoscopic approach and uterus was preserved in all cases. Laparoscopic uterus preserving technique not only offers the advantages of minimal access surgery but also preserves fertility and avoids the psychological trauma of hysterectomy. Conception and successful pregnancy is possible after repair of vesicouterine fistula [14]. Two of our patients conceived after surgery and completed their pregnancy. Both babies were delivered by elective cesarean dissection since there is fear of scar rupture in vaginal delivery. Pregnancy after fistula repair should be considered as high risk and followed properly till elective cesarean delivery.

Conclusion

Laparoscopic uterus preserving repair of vesicouterine fistula is a viable option for vesicouterine fistula. Besides cosmetic advantages and rapid recovery it preserves fertility and avoids the psychological trauma of hysterectomy.

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