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A modified Mainz II pouch technique for management of refractory vesicovaginal fistulas: Patient focused outcomes

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Abstract

Objective—To follow-up the quality of life outcomes in 2 women who underwent a modified Mainz II pouch procedure for refractory vesicovaginal fistulas.

Method—Two Nigerian patients were located after undergoing a modified Mainz II pouch procedure. They were interviewed 1–2 years post procedure regarding subsequent sexual function, pregnancy outcomes, and daily life.

Result—After undergoing the procedure the patients had resumed sexual function, had become pregnant, and had delivered viable neonates. They were also able to provide for their families.

Conclusion—A urinary diversion procedure for management of refractory vesicovaginal fistula can restore quality of life.

Keywords

refractory vesicovaginal fistula; Mainz pouch; sexual function; patient outcomes

1. Introduction

A significant issue for vesicovaginal fistula surgeons is the management of those patients whose defect is seemingly irreparable, especially patients who have failed one or more repair attempts by an experienced surgeon. Extensive review of the literature reveals that such patients are typically excluded in some case series [1–10] or casually mentioned in others [11–15]. Many surgeons have ultimately resorted to some type of ureterosigmoid diversion, although this procedure has been considered as a last resort or an admission of defeat by others [16, 17].

In Africa, considerable emphasis is placed on natural body image. Several surgeons have reported that other types of diversion, such as an ileal conduit, are not accepted socially, nor are the appliances for the collection of urine consistently available [11,18]. Dr Catherine

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Hamlin wrote that a woman is seldom sent back to her village with any type of permanent ostomy [19].

We discuss a modification of the Mainz II ureterosigmoid diversion procedure [20] performed in Jos, Nigeria, since 2001, and report on 2 patients who have conceived and delivered after this diversion procedure.

Historically, follow-up of these patients has been difficult and inconsistent. Little is known about subsequent sexual function and pregnancy after such a diversion procedure. A single report from Ghana described a patient who had undergone a traditional ureterosigmoid diversion, and who conceived and delivered a viable infant [21]. It was reported to us that 2 or more of the first 15–20 patients we treated with a modified Mainz II pouch diversion had returned pregnant. Two were located and interviewed in January, 2006, and are the subjects of this report.

2. Methods

The Mainz II pouch has been verified as a low pressure continent reservoir [22]. High pressure peristaltic contractions, which may contribute to reflux of fecal material into the ureters with the traditional technique, are interrupted with this type of pouch. Both the low pressure and increased volume of the reservoir are advantages over the traditional ureterosigmoid implants, which lack such a reservoir. In the modified protocol the sigmoid colon was expanded into a pouch that is somewhat smaller than the double fold of the original Mainz II pouch. Patients gave informed consent for the surgery and the primary author was invited back to interview the patients.

Prior to surgery it was recommended that every patient should home and explain the need and nature of diversion to the family. If the patient returned and wanted to proceed an examination was conducted to ensure that the rectum was intact, that there was good sphincter tone, and that the pelvic muscles could be contracted well. A process of rectal training was initiated whereby enemas were given in gradually increasing amounts and the patient was taught to hold the volume by contracting the pelvic floor muscles. The patient was cleared to undergo the procedure when she was able to retain 200 cm³ for at least 2 hours.

A full liquid diet was started 3 days before surgery. Nearer to the surgery date the patients were given castor oil followed by cleansing enemas for mechanical preparation of the bowel. Two doses of neomycin sulfate (when available) and erythromycin were given the afternoon prior to surgery.

In the operating room empiric broad spectrum antibiotics (usually gentamicin and ampicillin) were given. After general endotracheal anesthesia a rectal tube was inserted. A laparotomy was performed and the distal ureters were mobilized down to the level where they pass under the uterine arteries. Each ureter was clamped and cut proximal to this juncture. The distal stump was tied off and the proximal end of the ureter was held with a stay suture. A 15 cm linear incision was made along the antimesenteric border of the sigmoid colon, starting as near to the rectum as possible. The mobilized distal ureters were implanted using an open technique very similar to that described by Godwin et al. [23]. The submucosal tunnel was made intracolic, but no particular effort was made to keep the anastomoses retroperitoneal. Stents were used routinely and brought out inside the lumen of the rectal tube.

The defect created in the sigmoid was then closed transversely, with the former apices of the incision coming together in the middle and the former midpoints becoming the new apices, in 2 continuous layers of 000-Vicryl (Ethicon, Somerville, NJ, USA; Fig. 1). The larger traditional Mainz II pouch is shown for comparison in Fig. 2. Either type of pouch can be fixed to the

psoas muscles, or to the sacral promontory if kinking of the ureters is a concern. The rectal tube and ureteral stents are typically left in place for 5–7 days.

3. Results

Patient 1 had an arranged marriage at the age of 15. She was in labor for 2 days after an uneventful pregnancy and eventually delivered a stillborn male neonate. The labor and delivery occurred at her adoptive father's home, as is the tribal custom for primigravidas, and she was attended by an untrained aunt. Immediately after delivery she experienced urinary and fecal incontinence. She was very weak and was taken about 30 km to a district hospital where she remained hospitalized for 2 months. Her general condition improved and the fecal incontinence resolved, but nothing was done for her urinary incontinence. Two months later she returned to the same hospital for follow-up, but no treatment was offered for her vesicovaginal fistula. She presented to the Vesicovaginal Fistula Clinic in Jos, Nigeria, 2 years later and a physical examination revealed a complex circumferential fistula involving the bladder neck and proximal urethra (Waldijk type IIBb) [24]. A transvaginal vesicovaginal fistula repair was attempted. The fistula was successfully closed, but the patient remained totally incontinent through a short patulous urethra. The urethra was rigidly fixed and so a sling procedure was deemed to be not worth attempting. After counseling and discussion with her family she opted for a modified Mainz II pouch ureterosigmoid diversion procedure (approximately 3 months after the unsuccessful repair attempt). Recovery was uneventful except that she reported some fecal soiling at night.

The patient remarried sometime after the operation. She denied any dyspareunia and conceived almost 3 years later. During the pregnancy she intermittently attended an antenatal clinic in Jos and noted that the fecal soiling at night worsened during the pregnancy. She underwent an elective cesarean delivery at 39 weeks of pregnancy in March, 2004, and delivered a healthy female neonate.

At the visit to the family compound in January, 2006, the patient recanted the information that prior to the diversion procedure she had been confined to her uncle's compound. She had been sent to extended family in the Middle East to obtain treatment, but was told that the fistula was too complex. The 22 month old child was healthy and the patient appeared healthy and happy. She was reincorporated into village life, worked in the house, on the farm, and with the family's livestock. She attends the village market and occasionally takes other villagers into a large city, about an hour away by service taxi, for medical care.

Patient 2 had an arranged marriage to a cousin within the clan when she was 16. The patient conceived at approximately 24 years of age and her pregnancy was uneventful. She was in labor for 4 days at home with only her mother and father attending. She was then taken to a hospital in the state capital about 50 km from her home village and has no recollection of events at the hospital. She eventually delivered a stillborn female neonate. She remained in the hospital for 13 days and urine leakage started on postpartum day 5. She remained secluded at home for about 1 year before being taken back to the state capital, this time to a traditional healer, to treat footdrop. A distant relative who was working with expatriates told her family about the vesicovaginal fistula program in Jos, where she was then taken by her brother.

Her defect was severe and complex (Waldijk type IIBb) [24]. She had no urethra. A neourethra was constructed from local tissue in 2000—over 1 year after her delivery—but the repair broke down despite a Martius graft. She was reexamined 3 months after the operation and there was only a thin layer of fibrous tissue overlying the symphysis pubis. She was counseled and consented to undergo a modified Mainz II pouch procedure, which was conducted in early 2001. We visited her home several months after the diversion and her father asked if she could

return to her husband, and about the possibility of pregnancy. They were informed that pregnancy, while not likely to occur, was not totally impossible. The patient denied dyspareunia and reported that she continued having regular menses throughout her ordeal. She conceived approximately 2 years after returning to her husband, and her pregnancy was uncomplicated. She stayed with friends in Jos intermittently in early pregnancy and from the seventh gestational month until delivery. A healthy male neonate was delivered at term by elective cesarean in early April, 2004. Little mention was made in her operative notes about the pouch and minimal adhesions were noticed. The only problems she mentioned during and following the pregnancy were nocturnal fecal soiling and some intermittent right flank pain, which was occasionally associated with vomiting.

Prior to her urinary diversion she generally stayed indoors at the family compound while she recovered from her traumatic delivery and while she was incontinent. Since the diversion procedure she has been able to go to the market and was able to return to her husband. This latest reunion had occurred at the market where she had walked at least 7 km carrying a 30–40 pound calabash of grain on her head. The neonate born subsequent to the diversion procedure was doing well at 21 months of age.

4. Discussion

Consistent follow-up in these patients is extremely difficult secondary to cost and logistics. However, it is apparent that the modified Mainz II pouch procedure has the ability to allow these young women, who have sustained extensive childbirth injury, a chance to resume a functional life in their society. Both of the patients reported here were able to resume sexual activity with subsequent childbirth. They were also able to contribute to their tribes and family from an economic perspective.

The described modification of the Mainz II pouch differs from the original description in that the pouch is somewhat smaller in volume. This modification was thought to be a more expeditious way to accomplish the formation of a pouch and continue to facilitate a break in the peristaltic contractions of the colon. It is not known whether this modification inhibits peristaltic increases in intraluminal pressure as effectively as the originally described pouch. Immediate perioperative complications may include blood loss, infection, paralytic ileus, and problems with inadequate urine output. For the majority of time we have been doing the modified Mainz II pouch procedure, electrolyte testing was not available and pre- and postoperative intravenous urography was, and remains, cost prohibitive. Serum blood urea nitrogen (BUN) and creatinine levels were monitored pre- and postoperatively and follow-up postoperative rectal training was performed. Patients were requested to return for further follow-up in 3 months and as needed.

As this is a newly described procedure without adequate comparative trials we do not recommend this procedure over the larger traditional Mainz II pouch. These trials could perhaps compare associated morbidity, time of the procedure, and the association with persistent nocturnal fecal soiling.

In conclusion, despite the well known limitations of follow-up in this patient population, we were able to determine that women undergoing this procedure are able to resume sexual function, become pregnant, deliver a viable or infant child, and become reincorporated into their society. This procedure does provide a viable option for those patients having the most complex refractory fistulas. Clearly, prevention of these types of injuries is optimal, but until that time, the modified Mainz II pouch is a continent diversion providing an alternative to a life of poor quality and total rejection by society.

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Figure 1A

Figure 1B

Figure 1C

Figure 1.

Figure 1A and 1B. 15 cm longitudinal incision along the antimesenteric side of the distal sigmoid colon from point A to point B.

Figure 1C. The midpoints of the incision X and Y become the new apexes as the colon is closed transversely. The ureters are seen coming into the sides of the pouch posteriorly via submucosal tunnels.

Figure 2.
Traditional Mainz II pouch diversion.