Delivery after augmentation cystoplasty: Implications and precautions

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Abstract

A young female with history of genitourinary tuberculosis with solitary functioning kidney became pregnant 1 year after augmentation cystoplasty (AC) with ureteric reimplantation. Throughout pregnancy she had two episode of febrile urinary tract infection. Her renal function remained normal. She was planned for cesarian section due to obstetric indications. Despite altered pelvic anatomy, we successfully did the lower segment cesarian section. We reviewed the literature regarding pregnancy in patients with AC to find that what the treating Urologist and Gynecologist should know about these rare cases. Various complications which should be anticipated and measures to prevent them are also discussed.

Key words: Augmentation cystoplasty, cesarian section, delivery, pregnancy
INTRODUCTION

Although pregnancy rate after complex urological procedures is increasing due to better understanding and management of underlying problems, the literature about delivery in patients with augmentation cystoplasty (AC) is still limited.[1] We are reporting an interesting case of delivery in a primigravida with solitary functioning kidney and the history of AC with ureteric reimplantation. Throughout pregnancy she had two episode of febrile urinary tract infection (UTI). Her renal function remained normal. She was planned for cesarian section due to obstetric indications. Despite altered pelvic anatomy, we successfully did the lower segment cesarian section.

We reviewed the literature regarding pregnancy in patients with AC to find that what the treating Urologist and Gynecologist should know about these rare cases. Various complications which should be anticipated and measures to prevent them are also discussed.

CASE REPORT

A 23-year-old female presented to us with history of frequency, bedwetting, and recurrent fever for last 10 years. She also had several episodes of gross hematuria and occasional right flank pain. For last 2 years, urinary frequency gradually increased to every 15 minutes interval. The only significant past history was anti-tubercular treatment for pulmonary Koch’s 12 years back. The patient was evaluated outside. Her urine microscopy showed pus cells, but the culture was sterile. Ultrasonography (USG) and intravenous urography showed right gross hydro-ureteronephrosis (HDUN) with small contracted left kidney with severe calcifications. Micturition cysto-urethrogram (MCT) showed no vesico-urethral reflux, but was suggestive of “Thimble bladder.” Cystoscopy showed small contracted bladder and ureteral orifices couldn’t be identified due to edematous changes. Bladder biopsy showed granulomatous changes. In view of solitary functioning right kidney with gross HDUN, percutaneous nephrostomy (PCN) was done outside. The patient was referred to us for further management.

We did right nephrostogram, which showed gross HDUN with smooth tapering at the right vesicoureteric junction [Figure 1]. Her serum creatinine was normal. We performed the augmentation ileal cystoplasty with right ureteric reimplantation. Postoperative course was uneventful. Double J stent was removed after confirming normal MCU without leak [Figure 2]. The patient was symptomatically improved.

She became pregnant after 1 year of AC. At that time, she had no urinary complaint and her continence was normal. Throughout pregnancy she had two episode of UTI, treated with intravenous antibiotics. We kept her on low dose prophylactic antibiotic therapy. Her antenatal USG showed symmetrical intrauterine growth retardation with polyhydroamnios. On routine antenatal investigation she found to have hypothyroidism, for that the thyronorm (75 μg) was started. Throughout the pregnancy she maintained the normal serum creatinine levels.

At full term, the induction of labor was tried, but was unsuccessful. As the pregnancy was high risk in view of primigravida with solitary functioning kidney, hypothyroidism, and the history of previous urological reconstruction, the cesarian section was planned in the presence of urologist. The abdomen was opened with previous midline scar. Intra-operatively the

![Figure 1: Preoperative percutaneous nephrostogram, (a) Scout film showing right PCN and left calcified (Putty) kidney, (b) Nephrostogram showing gross right hydroureteronephrosis. Arrow is indicating smooth narrowing at the vesico-urethral junction](image1)

![Figure 2: Post-operative micturating cystourethrogram (MCU) showing normal augmented bladder with DJ stent in situ](image2)
urterovaginal fold was clearly visible. Urinary bladder was in place [Figure 3]. Few dense adhesions were seen between omentum and parietal peritoneum. Bowel loop, which was used for augmentation, was visible on right side of bladder and was undisturbed [Figure 4]. Incision was given over lower uterine segment and a live female baby of 2 kg was delivered. The cord blood sample was taken for the thyroid screening. The post-operative course was uneventful and the patient was discharged on day 3. At 3 month follow up, the patient had no urinary complaint.

**DISCUSSION**

AC in females is usually performed for small contracted bladder due to variety of inflammatory conditions, neurogenic bladder, idiopathic urge incontinence, or enuresis. The first pregnancy in a patient with AC for tubercular cystitis was published in 1955. Till date only few case reports are published on this issue [Table 1].

The goal in management of these patients is delivery of a healthy baby with preservation of renal function. The main

![Figure 3: Intraoperative photograph showing incised lower segment and undisturbed bladder](image1)

![Figure 4: Intraoperative finding: Forceps indicating the bowel loop, which was used previously for augmentation](image2)

**Table 1: Important studies of delivery in patients with augmentation cystoplasty**

| Study (author, year; ref) | N | Basic pathology | Complications during pregnancy | Delivered by |
|--------------------------|---|-----------------|--------------------------------|--------------|
| Hill et al., 1990;[6]     | 2 | Urinary diversion | Recurrent PN                   | VD           |
|                          |   | Urinary diversion (underwent AC+AUS) | Recurrent PN                   | VD           |
| Yamazaki et al., 1997;[8] | 1 | Spina bifida occulta | Frequent e/o febrile UTIs      | Classical    |
| Yamamoto et al., 1997;[8] | 1 | Spina bifida (5 patients, of which 1 underwent AC) | Severe PN in 25th week Febrile UTI once | CS           |
| Taniguchi et al., 2002;[7] | 2 | Spina bifida | Febrile UTI twice, required IV antibiotics+CIC | VD           |
|                          |   | Congenital hourglass bladder | Febrile UTI at 19th week At 19th wk, required indwelling urinary catheter | VD           |
| Quenneville et al., 2003;[8] | 3 | Sacral lipoma | Twice                            | VD           |
|                          |   | (Underwent RFS) | -                               |              |
|                          |   | Traumatic paraplegia | Severe PN at 28th wk, required hospitalization | VS           |
|                          |   | (Underwent RFS) | -                               |              |
| Sheikh et al., 2006;[9]  | 1 | Meningo-myelocele | Once                            | CS           |
|                          |   | Intestinal cystitis | -                               | DCS          |

N: Number of patients, AC: Augmentation cystoplasty, AUS: Artificial urethral sphincter, UTI: Urinary tract infection, PN: Pyelonephritis, HDN: Hydronephrosis, PCN: Per cutaneous nephrostomy, RFS: Rectus fascial sling, VD: Vaginal delivery, CS: Cesarian section
problems encountered in these patients are UTI, HDN, or deterioration in renal function.[1,4] Asymptomatic bacteriuria occurs in 50-100% patients with AC but only 4-43% has significant UTI.[10] In pregnancy with AC this risk obviously increases due to the altered anatomy, pressure effect, and urinary stasis. Hill et al. found the presence of UTI in 9 of 15 (60%) patients in the presence of Urologist, who is well familiar with the anatomy of augmented bladder.

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Another problem in patients with AC is metabolic complications like hypokalemic hyperchloremic metabolic acidosis, hypocalcemia, hypomagnesemia, and vitamin B12 deficiency,[10] but we have not encountered these problems in our patient.

We recommend some important aspects about the management of pregnancy in patients with AC. Regular urinalysis and aggressive treatment of any urinary infection, if found should be done. It is important to monitor the renal function and to look for hydronephrosis on USG. If cesarian section is planned, it should be preferably done in the presence of Urologist, who is well familiar with the anatomy of augmented bladder.