

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 (MCU) 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 polyhydramnios. 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

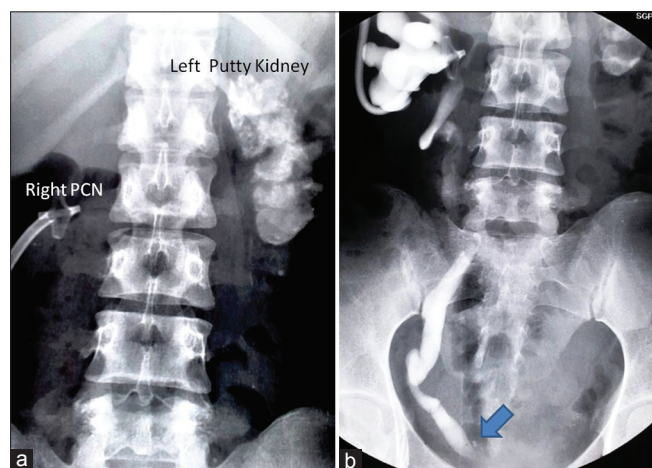


Figure 1: Preoperative percutaneous nephrostogram, (a) Scout film showing right PCN and left calcified (Putty) kidney. (b) Nephrostogram showing gross right hydronephrosis. Arrow is indicating smooth narrowing at the vesico-urethral junction



Figure 2: Post-operative micturating cystourethrogram (MCU) showing normal augmented bladder with DJ stent *in situ*

ureterovaginal 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.

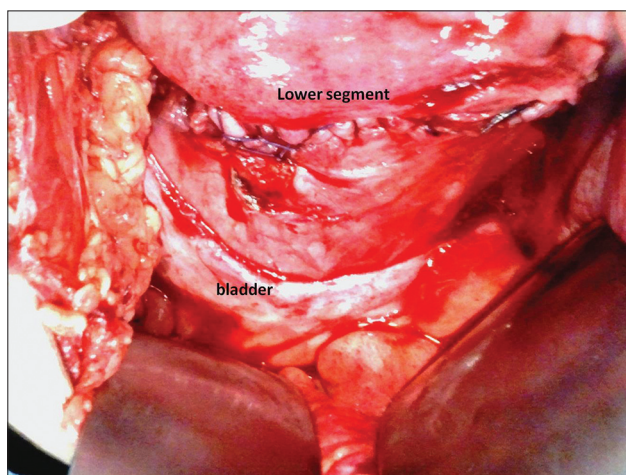


Figure 3: Intraoperative photograph showing incised lower segment and undisturbed bladder

DISCUSSION

AC in females is usually performed for small contracted bladder due to variety of inflammatory conditions, neurogenic bladder, idiopathic urge incontinence, or enuresis.^[2] The first pregnancy in a patient with AC for tubercular cystitis was published in 1955.^[3] 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

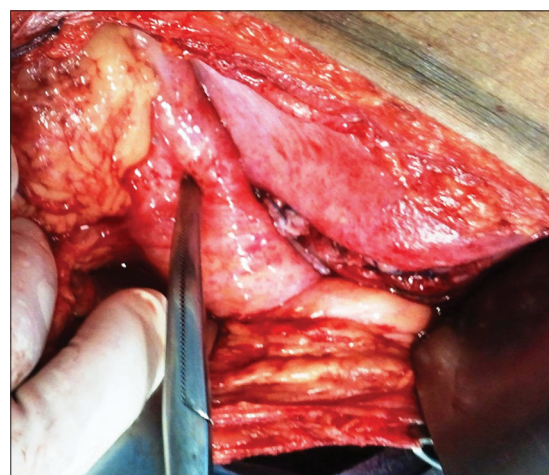


Figure 4: Intraoperative finding: Forceps indicating the bowel loop, which was used previously for augmentation

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

Study (author, year; ref)	N	Basic pathology	Complications during pregnancy			Delivered by
			UTI	HDN	Others	
Hill <i>et al.</i> , 1990; ^[4]	2	Urinary diversion Urinary diversion (underwent AC+AUS)	Recurrent PN	-	Led to premature labour	VD
			-	-	Malfunction of device	VD
Yamazaki <i>et al.</i> , 1997; ^[5]	1	Spina bifida occulta	Frequent e/o febrile UTIs Severe PN in 25 th week	In 2 nd trimester	HDN required DJ stenting	Classical CS
Yamamoto <i>et al.</i> , 1997; ^[6]	1	Spina bifida (5 patients, of which 1 underwent AC)	Febrile UTI once	Transient	-	CS
Taniguchi <i>et al.</i> , 2002; ^[7]	2	Spina bifida	Febrile UTI twice, required IV antibiotics+CIC	-	-	VD
		Congenital hourglass bladder	Febrile UTI at 19 th week	At 19 th wk, required indwelling urinary catheter	Lt PCN done at 29 th week due to PN and HDN, Also required ritodrine drip to inhibit premature contraction	VD
Quenneville <i>et al.</i> , 2003; ^[8]	3	Sacral lipoma (Underwent RFS)	Twice	-	-	VD
		Traumatic paraplegia (Underwent RFS)	Severe PN at 28 th wk, required hospitalization	-	Delivered with the aid of forceps, urinary leakage reappeared	VD
Sheikh <i>et al.</i> , 2006; ^[9]	1	Meningo-myelocele	Once	-	-	VD
		Interstitial cystitis	-	-	-	CS

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: Cesarean section

problems encountered in these patients are UTI, HDN, or deterioration in renal function.^[1,4]

Asymptomatic bacteriurea 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 their review.^[4] Several authors have suggested the use of long-term prophylactic antibiotics throughout pregnancy especially in patients with reflux.^[1] Some authors have also suggested the urethral catheterization, stenting or even PCN for the management of severe infections during pregnancy.^[5,7] Pyelonephritis may lead to the premature labor.^[4,11] Taniguchi *et al.* described a case in which they required drip infusion of ritodrine hydrochloride from 21st week of pregnancy to prevent premature contraction due to pyelonephritis.^[7]

There are some anatomical alterations which occur after bladder augmentation. Entero-cystoplasty is fixed cranially by the mesentery, laterally by ureter, and caudally by the trigone and urethra.^[1] When the uterus enlarges, it pushes the mesentery to one side and reaches to the ventral abdominal wall. During cesarian section there is possibility of damage to augmentation or its blood supply. Previous pelvic surgery may also predispose to marked adhesions. For these reasons, some authors advocate the upper-segment cesarian section rather than the LSCS.^[12]

The patients with AC who also undergone the vesical neck reconstruction or artificial urinary sphincter are particularly at the risk of damaging continence mechanism. Hill *et al.* have found the malfunction of artificial urinary sphincter after vaginal delivery in their patient.^[4] On the other hand, Quenneville *et al.* found no adverse effect of vaginal delivery on continence mechanism in two patients with rectus fascial sling, when he kept the bladder empty at the time of delivery.^[8] Several authors have recommended the cesarian section in patients with AC with bladder neck reconstruction, whether the vaginal delivery is not considered a contraindication in patients with AC alone.^[4,11]

Another problem in patients with AC is metabolic complications like hypokalemic hyperchloremic metabolic acidosis, hypocalcemia, hypomagnesemia, and vitamin B₁₂ deficiency,^[1] 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.

REFERENCES

- Hautmann RE, Volkmer BG. Pregnancy and urinary diversion. *Urol Clin N Am* 2007;34:71-88.
- Niknejad KG, Atala A. Bladder augmentation techniques in women. *Int Urogynecol J Pelvic Floor Dysfunct* 2000;11:156-69.
- Ojerskog B, Kock NG, Philipson BM, Philipson M. Pregnancy and delivery in patients with a continent ileostomy. *Surg Gynecol Obstet* 1988;167:61-4.
- Hill DE, Kramer SA. Management of pregnancy after augmentation cystoplasty. *J Urol* 1990;144:457-90.
- Yamazaki Y, Yago R, Toma H, Onodera J, Nakabayashi M. Pregnancy after augmentation cystoplasty. A case report. *Nihon Hinyokika Gakkai Zasshi* 1997;88:632-5.
- Yamamoto M, Yamada K, Hirata N, Kawata Y, Hirayama A, Kashiwai H, Momose H, *et al.* Pregnancy and delivery in the patients with spina bifida—report of 5 case. *Nihon Hinyokika Gakkai Zasshi* 1997;88:1005-12.
- Taniguchi A, Kakizaki H, Murakumo M, Nonomura K, Koyanagi T. Management of pregnancy and delivery after augmentation cystoplasty. *Nihon Hinyokika Gakkai Zasshi* 2002;93:39-43.
- Quenneville V, Beurton D, Thomas L, Fontaine E. Pregnancy and vaginal delivery after augmentation cystoplasty. *BJU Int* 2003;91:893-4.
- Shaikh A, Ahsan S, Zaidi Z. Pregnancy after augmentation cystoplasty. *J Pak Med Assoc* 2006;56:465-7.
- Khoury JM, Timmons SL, Corbel L. Complications of enterocystoplasty. *J Urol* 1992;40:9-14.
- Hill DE, Chantigian PM, Kramer SA. Pregnancy after augmentation cystoplasty. *Surg Gynecol Obstet* 1990;170:485-7.
- Greenwell TJ, Venn SN, Creighton S, Leaver RB, Woodhouse CR. Pregnancy after lower urinary tract reconstruction for congenital abnormalities. *BJU Int* 2003;92:773-7.

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