

Garland ileal reconstruction of the urinary tract for bilateral severe obstructive uropathy: A case report

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Abstract

Ileum as a ureteral substitution is gold standard option in case of large ureteral defects when other options seem to be undesired. We report a 53 years old female patient with bilateral obstructive uropathy due to iatrogenic cause, who was managed with garland ileal substitution for bilateral ureters after stabilization of renal function.

Keywords: Garland ileal reconstruction, Pelvio- ileal anastomosis, Ileo- ureteral anastomosis, Hydronephrosis.

Introduction

The use of ileal segments for ureteral substitution has become a valuable procedure in reconstructive urology since its first description in 1906 by Shoemaker and later popularized by Goodwin et al in the late 1950s.^{1,2} To repair large ureteral defects, ileal ureter remains a viable option. When alternatives such as ureteroureterostomy, ureteral reimplantation, psoas hitch, Boari flap, autotransplant or endoscopic management are not possible or desired, ureteral substitution with ileum is desirable.^{3,4} Recent decades have seen the indications for its use broaden, although it was initially described for tubercular obstruction. Little is known about long term outcomes following this technique, even though ureteral substitution with ileum is being practiced for over half a century.⁴

Case Report

A 53-year-old obese female patient, presented to the urological department in Ruby hall clinic, Pune with vomiting and fever for 3 days, pain in abdomen and burning no chest pain on and off for the past 4 months. Pain was vague in nature, dull aching, non radiating, aggravating or relieving factors. There was no history of trauma, hematuria or altered bowel habits. Past history of right open pyelolithotomy two years back, right ureteroscopy with laser lithotripsy with double J (DJ) stenting fifteen months back, right endopyelotomy with stenting twelve months back, right DJ stenting two months back and removal 10 days back. Over the past 3 years, the swelling had become irreducible and painful. The examination of the abdomen revealed well healed right pyelolithotomy scar. Routine investigation revealed abundant non crenated red blood cells, leucocyte esterase 1+ in urine routine analysis. Serum creatinine was 3.5 mg/dl, while total leucocyte count was 20,960 / μ l. Ultrasonography revealed mild to moderate hydronephrosis on the right side. Diethylenetriamine pentaacetic acid (DTPA) scan depicted normally functioning, hydronephrotic, obstructed right kidney with glomerular filtration rate (GFR) 43.87 ml/min and split function 68.33%. Left kidney was suboptimally functioning, hydronephrotic and obstructed with GFR 20.34 ml/min and split function 31.67%. A

diagnosis of bilateral obstructive uropathy was made and patient was planned for bilateral retrograde pyelography (RGP) with bilateral DJ stenting under broad spectrum antibiotic coverage. Intraoperative findings depicted left RGP showing narrowed and stenosed mid and lower ureter (Figure 1), with moderate hydroureter and hydronephrosis (Figure 2). Left 5 Fr x 26 cm DJ stenting was done. Right lower ureteric stricture was confirmed as 5 Fr ureteric catheter could not be negotiated (Figure 3), also right RGP showed abrupt cut-off at the proximal ureter with no visualization of right kidney (Figure 4). So decision on table of right percutaneous nephrostomy (PCN) was taken and was performed under C-arm control (Figure 5).

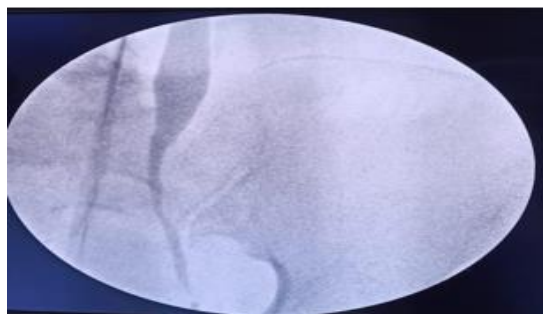


Fig. 1: Left RGP showing narrowed and stenosed mid and lower ureter



Fig. 2: Left RGP showing moderate proximal hydroureter and hydronephrosis

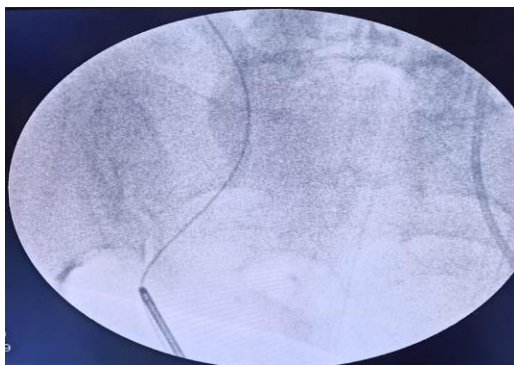


Fig. 3: Right lower ureteric stricture as 5 Fr ureteric catheter could not be negotiated

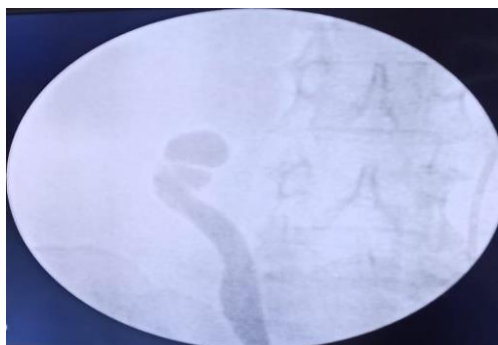


Fig 4: Right RGP showing abrupt cut-off at proximal ureter



Fig. 5: Right percutaneous pig tail insertion confirmed

Patient had uneventful post operative course and was discharged with left DJ stent and right PCN draining adequately. Two weeks later follow up and definitive surgery was planned. Routine investigation showed serum creatinine 1.4 mg/dl with total leucocyte count within normal range. Contrast enhanced computed tomography (CECT) of abdomen and pelvis (A & P) was performed prior to definitive surgery. It showed right PCN in situ with normal right pelvicalyceal system. Right ureter was collapsed in its entire length with surrounding fibrotic tissue. On delayed images, no contrast was seen passing through right ureter. Left inferior migration of DJ stent was noted due to kinking of left ureter at that level. Resultant moderate hydronephrosis was present.

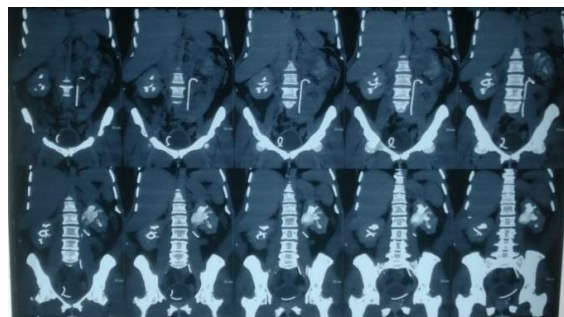


Fig. 6: CECT-A & P showing right PCN in situ with left inferior migration of DJ sent

Taking into consideration patients desire for definitive surgery, her obese status, past multiple urological surgical histories and prior operative findings patient was planned for major reconstruction of urinary tract with ileum. With pre-operative bowel preparation and under coverage of broad spectrum antibiotic abdomen was opened through midline incision. On mobilization of right colon, there was evidence of hydronephrotic right kidney with dilated pelvis. Right ureter could not be traced due to severe fibrosis. Left colon was mobilized. Evidence of stricturous segment of 1 cm at upper and mid ureter junction with proximal hydronephrosis. 15 cm from ileo-caecal junction, 30 cm loop of ileum dissected (Figure 7), proximal and distal end of the loop secured. Ileoileal anastomosis done with vicryl 3-0 in two layers. Right pelvio- ileal anastomosis done with vicryl 3-0 in interrupted fashion (Figure 8). Left ureter- iliac anastomosis done with vicryl 3-0 in interrupted fashion, after ligating the strictured segment with silk 2-0 (figure 9). Ileum to bladder anastomosis done over 5 cm with vicryl 3-0 in continuous fashion after inserting two 8 fr feeding tubes across pelvio- ileal and uretero- ileal anastomosis (figure 10). 14 fr supra pubic catheter and 16 fr per urethral catheter inserted. Right and left paracolic drain of 24 fr were inserted and abdomen was closed in layers.



Fig. 7: Loop of ileum measuring 30 cm demarked, 15 cm from ileo-caecal junction.



Fig. 8: Right pelvio- ileal anastomosis with vicryl 3-0 interrupted fashion



Fig. 9: Left uretero- ileal anastomosis with vicryl 3-0 in progress

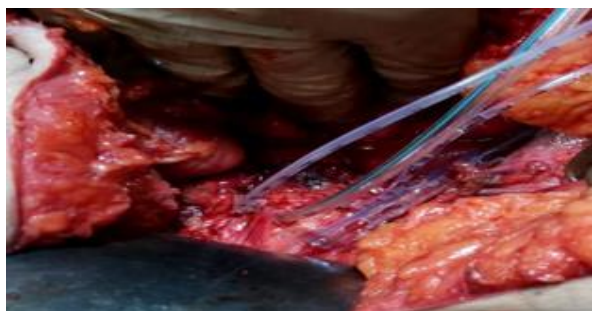


Fig. 10: Ileo- bladder anastomosis with two 8 fr feeding tubes across right pelvio- ileal and left uretero-ileal anastomosis with supra pubic catheter in situ

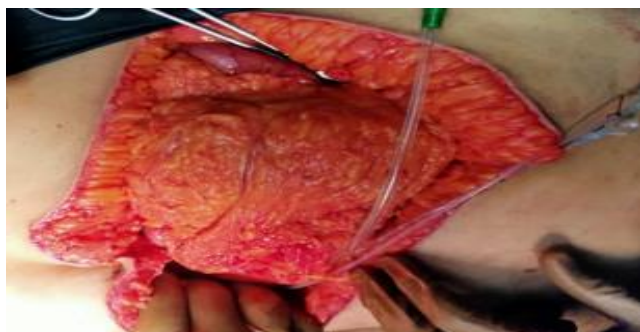


Fig. 11: Omentum covering the bowel prior to abdominal closure

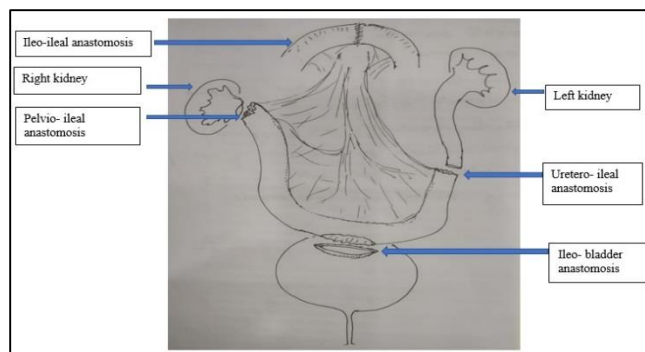


Fig. 12: Reconstructive image after the surgical procedure

The immediate postoperative was uneventful. Oral feeds were started on second postoperative day. Drains were removed once content was less than 50 ml. SPC was removed on the 5th post operative day. The patient recovered satisfactorily and was discharged after removal of alternate skin sutures on 10th postoperative day. During the follow-up visit after one week, wound infection was present with wound gap of 2 cm, which healed over period of 2 weeks. Later, the operative scar was found to be well healed and the patient was absolutely asymptomatic. No recurrence of symptoms during last 3 months of follow up. Serum creatinine value was stabilized at 1.3 mg/dl at 2 weeks post operative. DTPA scan done 2 weeks post procedure which showed normally functioning, non obstructed right kidney with GFR 52.82 ml/min and split function of 68.02%. It also showed improvement in GFR to 24.83 ml/min of left kidney as compared to pre- operative value with split function remaining the same.

Discussion

In patients with chronic ureteral obstruction most of the urologists rely on ureteral stents, percutaneous nephrostomy or nephrectomy as different options in treatment^{5,6} Patients who are not candidates for ureteral reimplantation, psoas hitch, boari flap, ureteroureterostomy, ureteral substitution with ileum provides urinary diversion without the requirement of drainage device or recurrent surgeries and preserving the renal function.⁷ The reports of ileum replacement for ureteral reconstruction has become a common place in last two decades. Avoidance of ureteral stents, nephrostomy tubes and nephrectomy are major advantages of ileal ureter.⁸

The causes of ureteral stricture include iatrogenic injury, retroperitoneal fibrosis or radiation.⁹ In our case, the cause of right ureteric stricture with pelvi- ureteric junction cut off was iatrogenic, while the cause for left ureteral stricture was idiopathic.

The risk of deteriorating renal function and hyperchloremic metabolic acidosis is low if patients are having good renal function pre-operatively. Serial creatinine values provide information regarding the renal function with time, though glomerular filtration remains the ideal assessment of renal function. Study conducted by Armatys et al, showed that 75% of patients had stable or improved

creatinine. It also reported that patients with serum creatinine less than 2 mg/dl reported no problems with electrolytes postoperatively.⁸ In our case report, serum creatinine value was pre-operatively corrected using right PCN and left DJ stenting. Postoperatively serum creatinine was stable. DTPA scan in our report showed improvement in function of both the kidneys. The risk of renal impairment was approximately 15% at 5 years and 20% at 20 years. Ileal ureteral substitution did not increase the risk of worsening the renal function. Majority of patients have stable renal function 10 years after surgery.¹⁰

For long segment ureteral strictures, some urologists prefer doing autotransplantation of the kidney. Several unique complications pertaining to autotransplantation include pseudoaneurysms, nephrectomy for bleeding, renal vein thrombosis or chronic pain, urolithiasis requiring percutaneous treatment.^{11,12}

Post-operative complications of ileal ureter substitution include mucous plugging, anastomotic stenosis, urine leak, colocutaneous fistula and worsening of renal function.¹³ In our case report we reported only wound infection with wound gap of 2 cm, which healed over period of 2 weeks. Follow up for three months did not show any significant life threatening complication.

Ileum substitution for ureter using refluxing, non-tailoring vesicoileal anastomosis can be used safely without renal deterioration or metabolic disturbance for patients with complex and difficult ureteral strictures, that are not candidates to more conservative measures.¹⁴

There are various alternative techniques to address the complex reconstructive challenge in panureteral stricture disease. Polytetrafluoroethylene (Gore-Tex) as a artificial ureteral substitute has been unsuccessful due to the fibrotic tissue reaction surrounding the foreign material and anastomotic stricture.¹⁵ First introduced by Naude in 1999, buccal mucosal ureteroplasty has been described as a possible alternative.¹⁶ Still ureteral substitution with ileum remains gold standard to which new approaches are being compared.

Conclusion

Ileal ureter remains an important option for patients with unilateral or bilateral obstructed ureter when other reconstructive measures from within the urinary tract seems to be impossible due to the location or the length of the stricturous segment. It offers preservation of renal function with long term results of relief of obstructive uropathy. Short term and long term complications should be weighed against the other optional procedures, one time solution and the patient compliance.

Source of Funding

None.

Conflicts of Interest

None

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