Original Article

Novel technique of laparoscopic extravesical ureteric reimplantation in primary obstructive megaureter

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Abstract

Objective: This study aims to demonstrate a novel laparoscopic technique of tapering megaureter without disrupting the blood supply and disconnecting the ureter.

Materials and Methods: Eight cases of primary obstructive megaureter in the age group of 14–22 years underwent laparoscopic extravesical ureteric reimplantation between August 2011 and July 2015 using our novel technique. Five patients had obstruction on left side and three on right side. Follow-up ultrasonography at 1 month and 3 months, voiding cystourethrogram (VCUG) at 3 months and intravenous urogram (IVU) at 6 months was obtained to assess the development of reflux and to look for adequate drainage of the obstructive ureter.

Results: Average age of the patients at the time of surgery was 18.5 years. Mean operating time was 95 min. Mean blood loss of 20 ml. VCUG done after 3 months showed no reflux in all cases. IVU done after six months showed no obstruction and complete drainage of dye.

Conclusion: Our technique of tapering obstructed megaureter over a preplaced ureteral dilator is time saving and also helps in preserving blood supply to lower ureter. As a result, ureteric anastomotic stricture rate is very low. It is easily reproducible in the open as well as by robotic.

Key Words: Laparoscopic ureteric reimplantation, novel technique, primary obstructive megaureter

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INTRODUCTION

Megaureter is a common occurrence with an incidence of 1 per 10,000 population. The male-to-female ratio is 1.2–4.8:1. The left-to-right ratio is 1.7–4.5:1. Obstruction is bilateral in 10%–20% of obstructed megaureter cases.[1] Initial management of primary megaureters is conservative. Indications for surgical intervention include symptoms such as febrile Urinary tract infections or pain and in the asymptomatic patient, a differential function (DRF) below 40% associated with massive or progressive hydronephrosis, or a drop in DRF on serial renograms.[2]

Various approaches have been described for the correction of the same.[3,4] Open techniques were considered as gold standard until laparoscopic techniques were refined.[5-7]

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Results of open techniques were mimicked by laparoscopic techniques.[8,9]

Most of the described laparoscopic techniques taper the ureter after exteriorizing the ureter through one of the ports.[6] The ureter is either tapered extracorporeally or it is tapered by extensively mobilizing the lower ureter and placing a catheter intraperitoneally. All these techniques jeopardize the blood supply to lower ureter resulting in lower ureteral stricture or anastomotic stricture requiring corrective surgeries. Sometimes, an extra port is placed to stabilize the ureter with the help of Maryland forceps. Of late robot-assisted ureteric reimplantations are also carried out.[10]

In the present study, we describe our novel technique of laparoscopic intracorporeal tapering of megaureter without disconnecting it from the bladder and later reanastomosing to an appropriate site on the bladder with detrussoraphy.

MATERIALS AND METHODS

Eight cases of primary obstructive megaureter (POM) requiring surgical intervention in the age group of 14–22 years underwent laparoscopic extravesical ureteric reimplantation between August 2011 and July 2015 using our novel technique. Patients with previous failed repair were excluded from this study. Five of them had obstructive megaureter on left side and three on right side. Six were males and two were females. Follow-up ultrasonography at 1 month and 3 months, voiding cystourethrogram (VCUG) at 3 months, and intravenous urogram (IVU) at 6 months was obtained to assess the presence of reflux and to look for adequate drainage of the obstructive ureter.

Our technique

After general anesthesia, the patient is placed in lithotomy position. Cystoscopy is done, and the involved ureter is cannulated with zebra guide wire. Teflon ureteral dilators are passed sequentially over the guide wire up to 12 Fr under fluoroscopy guidance. 12 Fr ureteral dilator is left in place about 10 cm above the vesicoureteric junction. An infant feeding tube is placed by the side of ureteral dilator for bladder drainage during the procedure [Figure 1].

The patient is then placed in supine position. Three laparoscopic ports are utilized. Two 10 mm and one 5 mm laparoscopic ports are inserted. Colon is mobilized and ureter is identified. The peritoneum covering the ureter is incised, and the ureter is mobilized up to 10 cm from bladder. In established techniques ureter is disconnected from the hiatus.[5,6] But instead in our technique, the ureter is first tapered over the dilator [Figure 2]. The dilator acts as a tool for identifying ureter, facilitating excisional tailoring, knowing the tapered ureteral diameter and also keeping the ureteral anatomy intact. This helps in preventing any disruption of vascular supply to the ureter from lateral side. The ureter is tapered smoothly for a distance of 6–8 cm

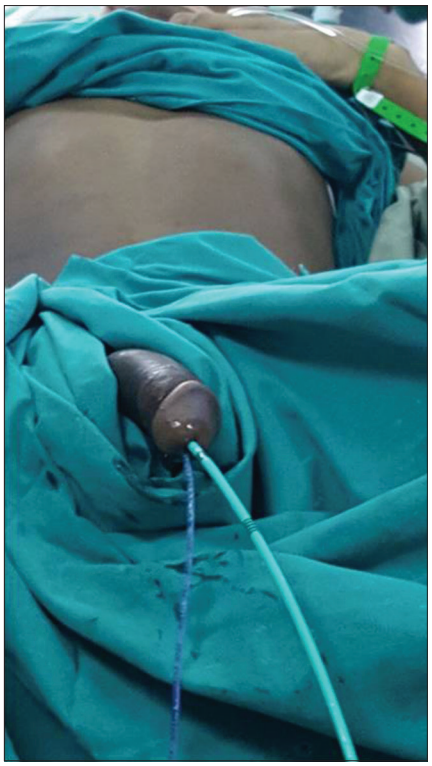

Figure 1: Ureter dilator along with infant feeding tube

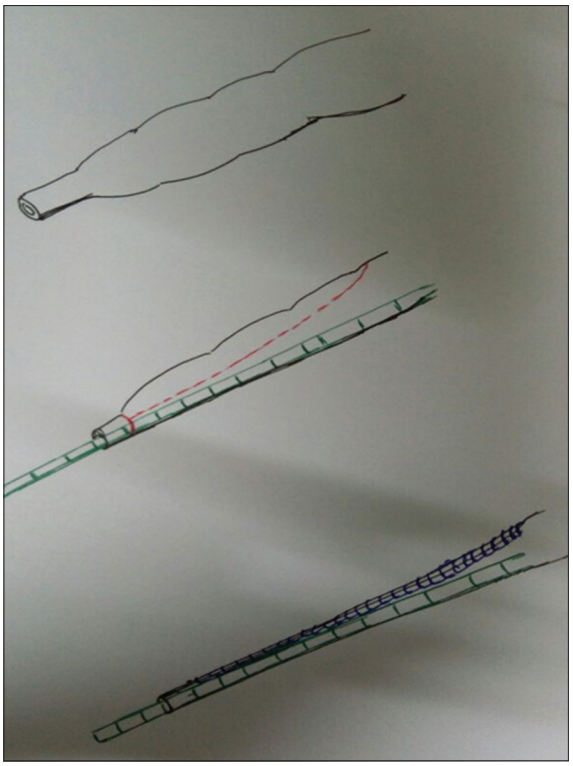

Figure 2: Schematic representation of tapering over dilator

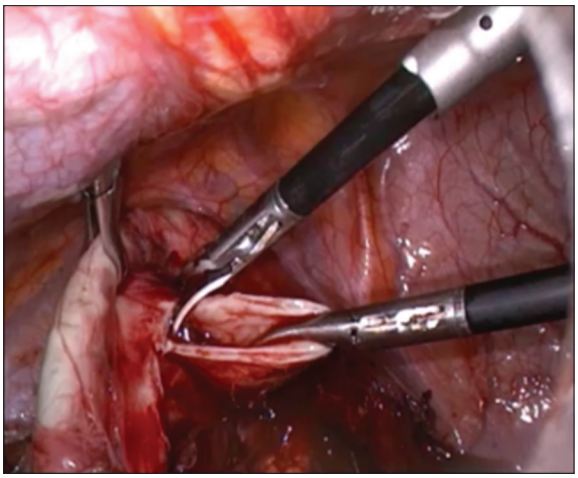

Figure 3: Intraoperative image

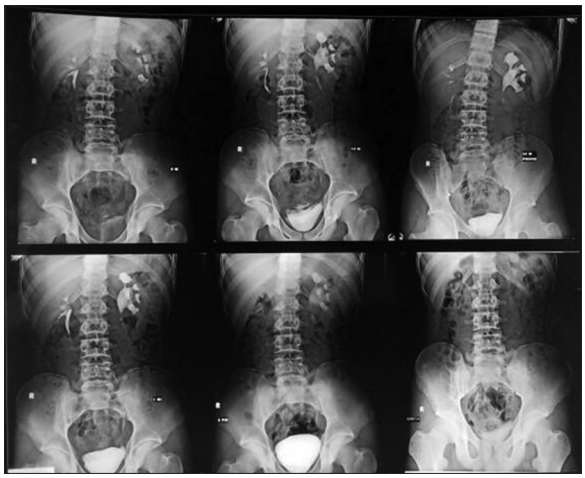

Figure 4: Postoperative intravenous urogram

from vesicoureteric junction [Figure 3]. The ureter is closed in watertight fashion continuously using 4-0 vicryl. The second layer of adventitia is closed with interrupted 4-0 vicryl suture.

A guide wire is then passed through the dilator from the distal end, and the dilator is exchanged for a 5 Fr double J stent. The ureter is now disconnected from bladder and reimplanted to a new site on the bladder by Lich-Gregoir technique.

The stents were removed 6 weeks postsurgery. There were no intra- or post-operative complications.

This technique can be used in open surgeries as well as robotic surgeries. The main advantage of this technique is that the blood supply to the ureter is maintained and the ureteral anatomy is left intact without any axial twisting. As a result, postoperative stricture of the lower ureter and anastomosis site is reduced to a minimum.

Follow-up

Follow-up ultrasonography of abdomen at 1 month and 3 months, VCUG at 3 months, and IVU [Figure 4] at 6 months were obtained to assess the development of reflux and to look for adequate drainage of the obstructive ureter.

Outcomes

Of the 8 cases operated with this technique all have been under regular follow-up. The mean operating time was 95 min (115–80 min). Mean blood loss was 20 ml (35–10 ml). The mean length of hospital stay was 2.3 (2–5) days. All showed complete drainage in postoperative IVU, and no reflux was demonstrated in VCUG. No evidence of any stricture was noted in any of the patients in IVU.

CONCLUSION

The proposed novel technique of ureteric reimplantation with tapering in POM is a simple, feasible and less invasive procedure that had good success rates in this small series. Further, larger studies are required to support or negate the usefulness of this technique.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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