CASE REPORT

Laparoscopic Transperitoneal Ureteroureterostomy for Retrocaval Ureter—a Case Report

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Abstract Retrocaval ureter is a rare developmental anomaly with an incidence of 1 in 1500 births. The inferior vena cava compresses the ureter posteriorly, causing upstream dilatation of the proximal ureter and the kidney. We report a 16-year-old girl who presented with right flank pain, diagnosed as retrocaval ureter with ultrasound, intravenous urogram and CECT, and was treated with laparoscopic transperitoneal ureteroureterostomy. Embryological aspects and laparoscopic technical considerations are highlighted in this case report.

Keywords Laparoscopy · Retrocaval ureter · Ureteroureterostomy · Circumcaval ureter

Introduction

Retrocaval ureter or circumcaval ureter is a rare congenital anomaly (1:1500) that causes hydronephrosis. Embryologically, preuretral vena cava is the accurate definition for this condition, which results in the ureter being wound around the inferior vena cava (IVC), with an obstructed segment behind the vena cava [2]. Dissection and excision of this atretic segment and anastomosis of the spatulated distal ureter tube to the dilated proximal ureter was done laparoscopically on a 16-year old who presented with this condition.

Case Report

A 16-year-old girl presented with recurrent right flank and upper abdominal pain with occasional bouts of fever and rigor. She had undergone investigations that revealed a dilated right-sided upper ureter on ultrasound. The lower ureter was poorly visualized. An intravenous urethrogram revealed an S-shaped dilated right-sided pelvis of the upper ureter and a fish hook sign. CECT of the whole abdomen confirmed the diagnosis of retrocaval ureter (Fig. 1). Hence, we proceeded with laparoscopic treatment of the same.

Through four ports (umbilical/optical 10 mm, epigastric retraction 5 mm, midline 5 mm, right lumbar region 10 mm working ports), the right colon and hepatic flexure were mobilized medially. The IVC and duodenum were then exposed along with the right renal vein and adrenal gland. A hugely dilated right renal pelvis and a dilated right ureter with active peristalsis were visualized. The ureter was seen to go under the IVC from the lateral border and re-emerge at the medial border of the IVC at the level of L3, after which it seemed to come anteriorly again. The IVC was gently freed from surrounding adventitious tissue, and the ureter was grasped and traced to its position of crossing the cava. After the ureter was freed, the atretic portion was cut distally; the upper ureter was cut as well. The cut edge of the lower ureter was washed out. The upper end of the distal ureter was spatulated, and stay sutures using 3-0 vicryl were used to approximate both upper edges of the ureters. The heel of the anastomosis was next laid in with sutures going out-in into the upper ureter and in-out through the lower ureter, with knots on the outside. After the heel and toe sutures were put in, a 5F double J stent was introduced percutaneously through a grey Venflon and inserted distally up to the bladder and proximally up to the pelvis. Then, the posterior layer of suture was completed with the needle going externally out-in and in-out. Finally, the

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Fig. 1 CT scan showing the fish hook sign

anterior edge was also completed by suturing with 3-0 PDS. The entire anastomosis was done with interrupted sutures, placed 1–3 mm apart (Fig. 2). The area was drained, and wounds were closed. The patient had an uneventful postoperative period and discharged on the third postoperative day.

Discussion

It is now accepted that persistence of the posterior subcardinal vein causes the proximal IVC to remain ventral to the ureter; this condition is known as a circumcaval or retrocaval ureter. This developmental anomaly occurring with a frequency of 1:1500 is said to be a faulty development of the cava rather than the ureter [2, 3]. First reported by Hochstetter in 1893 [1], the retrocaval ureter is one of the causes of hydronephrosis usually occurring on the right side. Anatomically, it is worth remembering that the retrocaval segment of the ureter is often atretic and is best excised or left alone with the proximal and distal ureters being anastomosed in front of the cava [4]. Spatulation of the ureters prior to anastomosis is very important in order to prevent stricture of the anastomosis. The double J stent, passed on either side, is also a useful adjunct.

We found that an HD camera afforded excellent visibility of the cava, pericaval adventitial tissue and the ureter proximal and distal to the IVC. Reflection of the hepatic flexure of the colon allowed complete exposure of the cava, duodenum and dilated renal pelvis. Spatulating the ureter was technically

Fig. 2 Completed ureteroureterostomy

difficult, but stay suture at the upper edge of the proximal ureter, held up by a cobbler needle, splayed open the proximal lumen and permitted important heel-toe sutures of anastomosis, after which the stent was pushed in.

The total operating time was just about 120 min. We believe that with increased laparoscopic skill/training available across the world, laparoscopic ureteroureterostomy for retrocaval ureter is the primary treatment with conversions to open in cases of difficult anastomosis or associated congenital anomalies [2].

Conclusion

A case report of laparoscopic surgery for retrocaval ureter is published with highlights of embryological and laparoscopic technical difficulties. This publication sensitizes most surgeons to tackle this problem through minimal-access surgical techniques.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interests.

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