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Ureter Kinked around the Superior Mesenteric Vein Causing Features of Pelviureteric Junction Obstruction: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. Author RC contributed substantially to the conception, design, acquisition of data, analysis and interpretation of data, review of literature and drafting the article. Authors RS, RB, AV, AD and SS contributed to Critical revision of the article, read and approved the final manuscript.

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Case Report

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ABSTRACT

Pelviureteric junction obstruction (PUJO) is the condition where flow of urine from the renal pelvis to the ureter is hindered due to various intrinsic or extrinsic causes. Lower pole renal vessels are mostly associated with this condition. Unlike our case, there have been reports of ureter being kinked around the Veins of Retzius but there has been no case report of ureter being kinked around the superior mesenteric vein directly causing features of PUJO.

Keywords: PUJO; pyeloplasty; superior mesenteric vein; endopyelotomy; veins of retzius.

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1. INTRODUCTION

Pelviureteric junction obstruction (PUJO) is a condition in which the flow of urine from the renal pelvis to ureter is obstructed. This condition is more often seen in children but not rare in adults. The overall incidence of PUJO is between 1 in 1000 to 1 in 2000 live births. Antenatal ultrasonogram (USG) of the abdomen can detect this condition in growing foetus [1]. About 80% of the dilated pelvicalyceal systems in the growing foetuses are due to PUJO [2]. It is more common in boys and is frequently seen on the left side.The causes of obstruction are classified as intrinsic or extrinsic. They could be primary or secondary. The crossing renal vessels are an important extrinsic cause of PUJO. A crossing aberrant lower pole renal artery is the most common offending vessel [2]. There has been case reports of ureter being trapped between the vein of Retzius [3] but to the best of our knowledge there has been no case where the ureter was kinked around the superior mesenteric vein leading to features of PUJO.

2. CASE REPORT

We present the case of a 23 years old female who has been coming to OPD (outpatient department) time and again with right flank pain along with occasional nausea for last one year. No lump was palpable on abdominal examination. Her routine haematological and biochemical investigations were within normal limits. Urine examination showed pus cells and a positive leucocyte esterase. USG showed hydronephrotic right kidney with dilated pelvis. Patient underwent CT urography which revealed hydronephrotic right kidney with dilated PUJ and upper ureter with bilateral normally excreting kidneys (Fig. 1). The patient was taken up for open Anderson Hynes dismembered Pyeloplasty. The right PUJ and upper part of ureter was grossly dilated until a point where the ureter was kinked around the superior mesenteric vein (SMV) (Fig. 2). The ureter was divided just distal to the junction of the dilated and normal ureter. The redundant pelvis and the grossly dilated upper ureter was excised and the pelviureteric anastomosis was done over a 6F double J stent to bring it anterior to SMV (Fig.3). The patient was sent home on the fourth post operative day after an uneventful hospital stay. The double J stent was removed after 03 weeks. She is still in follow up and symptom free. The facility of nuclear scan is not available in the institution and closest center to offer this facility is 250 kilometres away hence it could not be done.

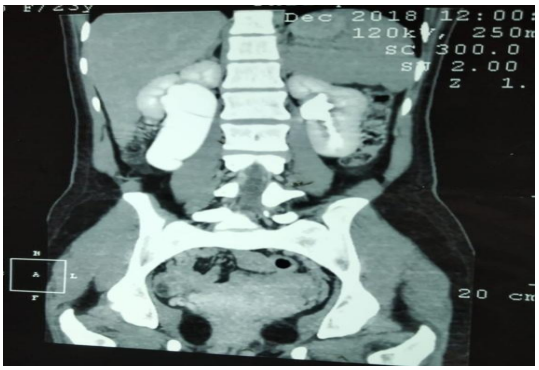

Fig. 1. CT urography showing the dilated right renal pelvis and upper ureter

Fig. 2. Showing dilated upper part of the ureter and PUJ kinked around superior mesenteric vein

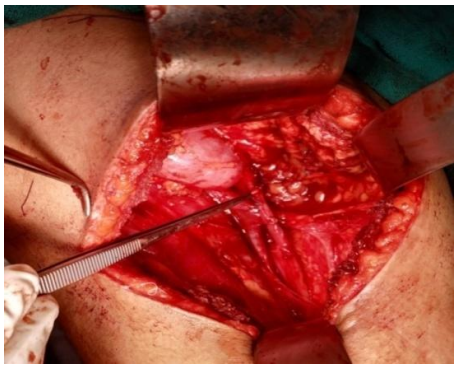

Fig. 3. Showing anteriorly placed uretero pelvic anastomosis

3. DISCUSSION

Pelviureteric junction (PUJ) obstruction refers to a condition where the drainage of urine from the renal pelvis to the ureter is obstructed. This can

be due to the intrinsic causes or any extrinsic cause. Most common cause of intrinsic PUJO is disorientation or complete absence of muscle fibres or excessive collagen deposition in the muscle fibres at PUJ along with decrease of nerve terminals and nerves at stenotic segments. These all factors lead to ineffective peristalsis causing caliectasis and hydronephrosis and failure of passage of urine from renal pelvis to the ureter. Impacted stones, strictures secondary to instrumentation, ureteral polyps and persistent fetal involutions are other intrinsic causes of PUJO. A crossing lower pole renal vessel is the most significant external cause of PUJO apart from external compression of the PUJ by kinks, tumors, high insertion of ureter or retroperitoneal fibrosis [1,2,4]. Lower pole crossing vessels may arise from aorta, vena cava, renal vessels or iliac vessels. Most of the times crossing vessels are arteries and they are anterior branches [5]. They may be the only possible cause of PUJO [1]. Maheshwari et al has reported a case of 26 years old female where the PUJO was caused by Veins of Retzius [3]. They are the anastomotic channels between superior or inferior mesenteric vein and the inferior vena cava. They can provide a route for the spread of colonic malignancies and can easily be injured during the right hemicolectomy The kinking of ureter due to wrapping around the superior mesenteric vein leading to features of pelviretericjunction obstruction has never been reported in literature. It is very difficult to say if the crossing vessels are responsible for PUJO or they are mere associations with this condition as it occurs in about 25-50% of the patients. Crossing vessels can be a source of haemorrhage during minimally invasive techniques for PUJO like endopyelotomy. They further can be a cause of recurrent obstruction after minimal access surgery thus responsible for long term failure of these techniques. The patients usually present with an intraabdominal mass, flank pain, nausea, and repeated features of urinary tract obstruction (UTI). USG of the abdomen is the initial investigation of choice which will pick up the dilated pelicalyceal systems and the pelvis. Antenatal USG can even pick up hydronephrosis in the foetuses from 16- 20 weeks onwards. An antero posterior diameter of renal pelvis more than 10-11 mm is diagnostic of PUJO. A Doppler resistive index of > 0.7 is an indicator of obstruction [6] Intravenous pyelography (IVP) used to be the diagnostic modality in past but now a days it has been replaced with nuclear scans. They can diagnose obstruction as well as predict the differential renal function (DRF) thushelping in planning the surgical intervention. Dimercaptosuccinic acid (DMSA) is a cortical agent whereas diethylenetriamine-pentaaceticacid (DTPA) and mercaptoace-tyltriglycine (MAG 3) are the tubular agents. MAG-3 is considered the best scan for diagnosing PUJO. A clearance of less than half of total radio isotope at 20 minutes is considered diagnostic of PUJO. A DRF of less than 10% is an indication for nephrectomy [1]. Computerised tomographic angiography (CTA), CT urography, Magnetic resonance angiography (MRA) or MR urography gives the detailed renal morphological picture along with the renal vascular relationship to the PUJ. Every patient is not a case for treatment. Hydronephrosis will disappear after birth in about 75% of the neonates. Worsening symptoms or deterioration of the renal functions in a patient of PUJO are indications for surgical treatment. The goals of surgery are to ensure free drainage of urine, enhance renal functions, prevent complications and to render the patient symptom free [1,2]. Anderson Hynes dismembered pyeloplasty is considered as the gold standard but the more conservative and minimally invasive techniques are also being employed with equivalent success. Open dismembered Pyeloplasty has a success rate of about 95% [4]. It can also be done by transperitoneal, retroperitoneal or robotic assisted through laparoscopic approach. The aim of pyeloplasty is to remove the scarred portion of PUJ, excise the redundant pelvis and fashion an anterior uretropelvic anastomisis to ensure the free and dependent exit of the urine from kidney to the ureter. An antegrade or a retrograde endopyelotomy is the minimally invasive endoscopic approach with about 85% success rate but the renal vascular information is important as the lower pole renal vesels can lead to hemorrhage in case of injury at endopyelotomy. Ureter can be attached to a lower pole renal calyx in case of failed open pyeloplasty and extensive renal scarring [1,4]. We contacted the patient telephonically and she is doing well. She was called upon for review investigations but she couldn't turn up for the same due to being from a far flung area around 200 kilometres away however, The patients should be followed with USG and MAG3 scans to ensure resolution of symptoms, improved renal functions and early detection of recurrence or treatment failure.

4. CONCLUSION

Lower pole crossing vessels are most important extrinsic cause of PUJO. Ureter getting

entangled around the superior mesenteric vein is a very rare cause of PUJO. Anderson Hynes dismembered pyeloplasty is the treatment of choice.

CONSENT

Written informed consent was obtained from the patient for publication of this Case report and any accompanying images.

ETHICAL APPROVAL

As per international standard guideline written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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