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Recurrent back pain of unknown etiology - suspect an urological origin!

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Abstract

Ureteropelvic junction (UPJ) obstruction poses a diagnostic challenge when the patient arrives at the emergency department with severe recurrent back pain without previous record of this condition. Extrinsic factors including crossing vessels or intrinsic factors such as adynamic segment of proximal ureter can cause UPJ obstruction. We report a case of a 16 year-old female patient with ureteropelvic junction syndrome occurring at adolescence, caused by two accessory vessels. She was submitted to a laparoscopic dismembered pyeloplasty with favorable outcome.

Keywords

Ureteropelvic junction syndrome; pyeloplasty; hydronephrosis; recurrent back pain.

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Introduction

Back pain is a common complaint at the emergency departments (ED). Often, patients with chronic intermittent back pain with multiple visits to medical providers find it difficult to make the diagnosis. Ureteroplevic junction (UPJ) obstruction is an important diagnosis to consider. Symptoms of UPJ obstruction are back or flank pain, nausea, vomit, febrile urinary tract infection and hematuria. The estimated incidence of UPJ obstruction in pediatric population is 1 per 500-2000 newborns screened by routine antenatal ultrasound, so we should think about this etiology in patients with back pain [1-5]. Symptomatic UPJ obstruction is more common later in life [4]. Anatomic lesions or functional disturbances that restrict urinary flow across the UPJ may cause obstruction, resulting in hydronephrosis [1-3, 6].

Case Report

A 16-year-old caucasian girl presented with intermittent right back pain aggravated by water ingestion and exercise. She had no history of antenatal hydronephrosis, urinary tract infections or urolithiasis during childhood. A physical examination identified her blood pressure was 110/70 mmHg and revealed mild tenderness on palpation at the upper right quadrant of the abdomen.

Laboratory investigations showed creatinine 0,81 mg/dl (glomerular filtration rate (GFR) of 80.5 mL/min per 1.73 m^2), urea 30 mg/dl. Hemoglobin, hematocrit, and ionogram, calcium, phosphate and magnesium were within normal limits. Urinalysis revealed microscopic hematuria, normal density, no proteinuria, whereas the urine culture was negative.

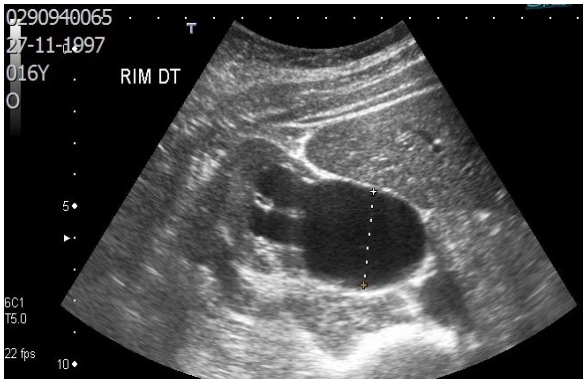

Fig. 1. Ultrasonography showing severe hydronephrosis of the right kidney and moderate diffuse reduction of renal parenchyma.

Renal ultrasound showed right severe hydronephrosis with 31 mm (anteroposterior diameter) associated with a modest loss of cortex thinning of the right kidney with renal asymmetry; left 140 mm, right 115 mm bipolar renal diameter [Fig. 1].

Helical computed tomography (CT) angiography with 3D reconstructed images showed a polar right renal artery arising from the abdominal aorta toward the lower pole of the right kidney conditioning a severe upstream hydronephrosis [Fig. 2].

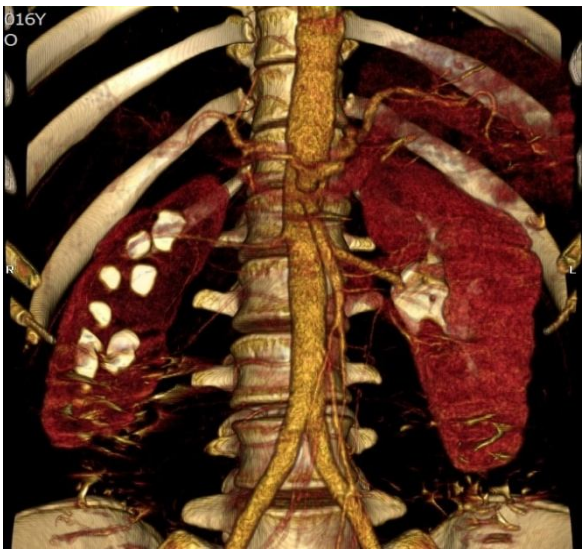

Fig. 2. Helical CT angiography with 3D reconstructed image identifying an accessory inferior renal polar artery at the level of the UPJ above which the pelvis demonstrates severe hydronephrosis.

Diuretic renography with mercaptoacetiltriglicine (MAG-3) revealed the right kidney differential function of 28 % with an arrested pattern of excretion suggesting pyeloureteral obstruction [Fig. 3.]

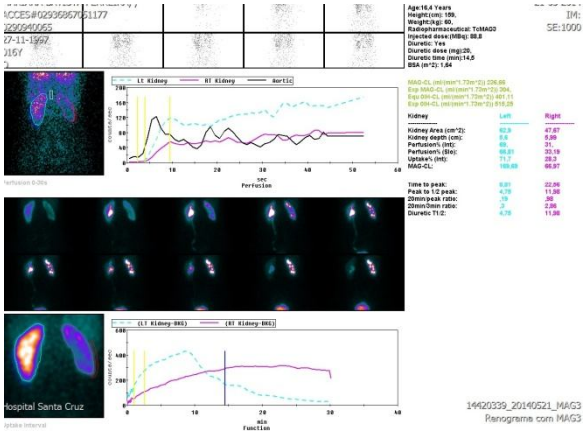

Fig. 3. MAG-3 diuretic renogram showed 28% uptake of the tracer and a glomerular filtration rate of 67 ml/min/1,73 m^2 with delayed washout of tracer in right kidney with an essentially flat-line curve ($T_{1/2}$ 12 minutes).

The intraoperative retrograde pyelogram revealed hydronephrosis and a dilated renal pelvis with ureteral kinking [Fig. 4].

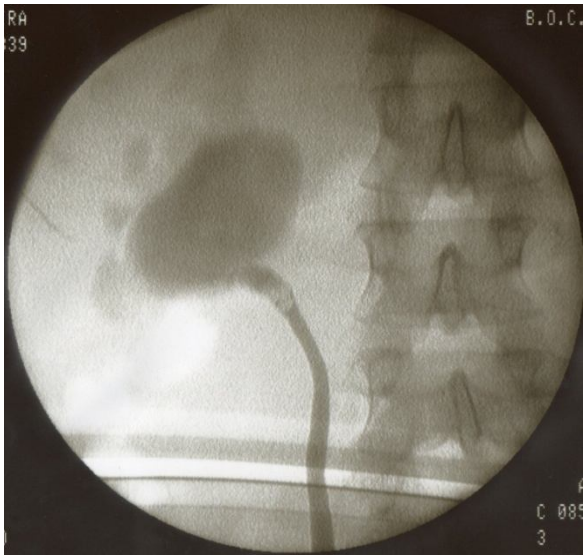

Fig. 4. Retrograde pyelogram revealed a dilated renal pelvis with ureteral kinking.

During the laparoscopic approach two vessels (artery and vein) were identified anteriorly to the pyeloureteric junction conditioning an ureteral kinking similar to a swan-neck ureter. Laparoscopic Anderson-Hynes dismembered pyeloplasty with transposition of anterior crossing vessels was done with a double 'J' 7.0 French stent insertion. The patient was discharged on postoperative 3rd day under cefuroxime therapeutic treatment. The stent was removed 3 weeks later and the patient showed complete resolution of her symptoms after 3 months of follow-up.

Discussion

Crossing vessels may be responsible for intermittent UPJ obstruction, and has been reported in the etiology of UPJ obstruction in 11% to 79% of cases [1,4,6,7]. Its intermittent nature may explain why it is detected later in life, as seen with present case study patient [1,4].

The delay in diagnosis can lead to significant kidney damage and gradual loss of kidney function in an otherwise asymptomatic patient. Crossing vessel is considered a risk factor for deterioration of renal function in children with hydronephrosis and is an indication for an early pyeloplasty in children [3,6]. This patient had impaired renal function on MAG3 renogram with a differential function of right kidney of 28%. As well as thinning of the right kidney cortex in renal ultrasound

and mildly reduced kidney function (GFR 80.5 ml/min/1.73m^2). This is considered stage 2 of chronic kidney disease (GFR 60-89 ml/min/1.73m^2) and justifies close follow-up of kidney function [8].

The management of UPJ obstruction syndrome is conditioned by the etiology of the obstruction. When there is renal parenchyma that can be preserved, the obstruction can be solved by one of two possible approaches: endopyelotomy or pyeloplasty, the latter can be performed through open surgery, laparoscopic or robotic surgery [9].

In the presence of crossing vessels diagnosed preoperatively it is preferable to perform pyeloplastic procedures to avoid the lesion of vessels with the endoscopic incision of the UPJ. Although the endopyelotomy can be performed in this situation the success rates are lower with this approach and the eventual risk of uncontrolled hematuria or later fibrosis of the ureteral scar must be considered [1,9,11].

The development of minimally invasive approaches such as laparoscopic or robotic surgery reduces the morbidity associated with bigger wounds that are performed in classic open surgical procedures such as dorsal lumbotomy (e.g. pain in surgical recovery, physical mobilization after procedure, wound infection or aesthetical morbidity). For this reason minimal invasive surgical approaches are favored in the management of UPJ obstruction [9].

To conclude, severe recurrent back pain could be caused by UPJ obstruction, it is important to increase awareness of this condition amongst our nonurologic colleagues. Hence, knowledge of the embryology of the renal vessels is necessary to understand the presence of an anomalous vessel crossing the UPJ that can cause obstruction.

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