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Management of Ureteropelvic Junction Syndrome Caused by a Lower Polar Vessel Discovered Intraoperatively: A Case Report

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Abstract | **Case Report**

Ureteropelvic junction syndrome (UPJS) is an obstruction of the upper urinary tract. It is the most common obstructive congenital uropathy in children and also frequently seen in adults. It is defined as a congenital or acquired obstruction between the renal pelvis and the ureter, leading to dilation of the upstream pyelocaliceal cavities with a normal-caliber downstream ureter, causing impaired urine transport from the pelvis to the ureter. The reference imaging examination remains the CT urography, combining arterial phase (to assess polar vessels) and delayed phase images, showing significant renal pelvis dilation, possibly associated with calyceal dilation, and a slender ureter. The gold standard treatment is open pyeloplasty using the Kuss-Anderson technique.

Keywords: Junction pyelo-ureteral, crossing, pyeloplasty.

INTRODUCTION

Ureteropelvic junction syndrome is an obstruction of the upper urinary tract and the most frequent obstructive congenital uropathy in children, also commonly found in adults [1]. It is defined as a congenital or acquired obstruction between the renal pelvis and ureter, causing upstream dilation of the pyelocaliceal cavities and a normal-caliber downstream ureter, impairing urine transport [2]. The obstruction may be primary and intrinsic (the most frequent congenital ureteral anomaly), or secondary, due to the presence of a lower polar vessel compressing the ureter. In 1842, Von Rokitansky first described the association of a lower polar vessel (LPV) with UPJS [3]. Most often, a vascular pedicle crosses the ureter anteriorly, causing extrinsic compression.

Diagnosis of a lower polar vessel is challenging with conventional ultrasound but has improved with Doppler ultrasound. [4]. However, CT urography remains the gold standard, combining arterial and delayed phases, revealing a significantly dilated renal pelvis, with or without calyceal dilation, and a thin lumbar ureter [2]. The standard treatment is open pyeloplasty via the Kuss-Anderson technique [2,3,7]. We present a clinical case of a patient admitted to the urology department of CHU Lamordé, Niger, with UPJS.

CASE REPORT

A 20-year-old female student with no known medical history presented to CHU Amirou Boubacar Diallo with left lumbar pain. History revealed recurrent episodes of moderateintensity crushing-type left lumbar pain over the past five years, with no radiation or specific relieving posture, alleviated by NSAIDs and analgesics. Initial investigations included a plain abdominal X-ray (unremarkable) and renal ultrasound, which revealed left pyelocaliceal dilation. A left JJ stent was inserted, resulting in immediate pain relief. The stent was removed after 45 days. However, three months later, the patient experienced a recurrence of intense crushing-type left lumbar pain (visual analog scale: 8), relieved by knee-flexion position and resistant to usual analgesics. A CT urogram confirmed ureteropelvic junction syndrome with a bifid renal pelvis at the junction (Figure 1). Pyeloplasty was indicated. Preoperative lab results were

within normal limits. Anesthesia evaluation declared the patient fit for surgery.

Under general anesthesia, the patient was positioned in right lateral decubitus, left leg flexed, and contralateral leg extended. A 5 cm left posterior lumbotomy was performed below the 12th rib, followed by dissection through the external oblique, internal oblique, and transversus abdominis muscles. The proximal ureter was identified retroperitoneally, looped, and dissected to the ureteropelvic junction.

Findings: A lower polar vessel was found crossing and compressing the ureter, with significant renal pelvis dilation (Figure 2). The stenotic segment was excised with scissors (Figure 3). The vessel was systematically transposed posteriorly, and the ureter was repositioned anteriorly. The ureter was sectioned 1 cm below the stenotic area, spatulated, and the renal pelvis was trimmed and reshaped. A JJ stent was inserted antegradely using a Terumo guidewire, followed by ureteropelvic anastomosis with 3/0 absorbable sutures (Figure 4). A suction drain was placed, and the surgical site closed in layers. Blood loss was minimal.

Postoperative recovery was uneventful. The patient was discharged on postoperative day 5 with confirmation of proper JJ stent placement on imaging. A 30-day follow-up was scheduled for clinical assessment and possible stent removal under local anesthesia. Unfortunately, the histopathological analysis of the resected junction tissue (Figure 5) could not be performed due to financial constraints. A new ultrasound performed 4 weeks postoperatively showed no dilation. (Figure 6)

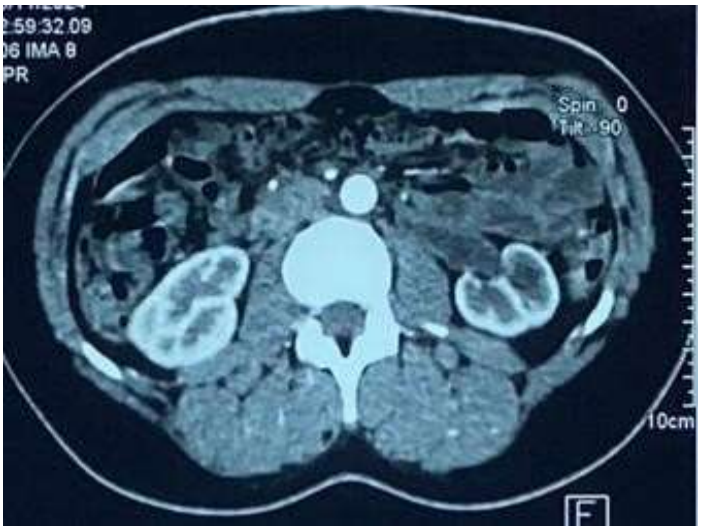

Figure 1: UPJS with bifid renal pelvis at the junction

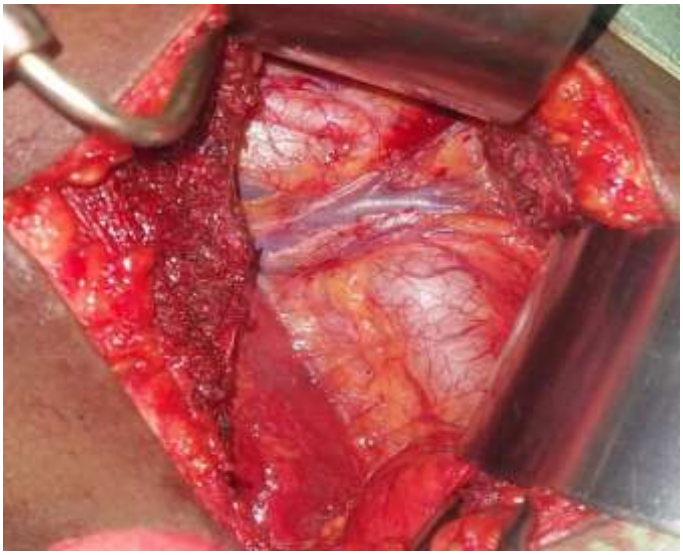

Figure 2: Lower polar vessel crossing the ureter with significant pelvic dilation

Figure 3: Ureter sectioned at stenotic zone and spatulated

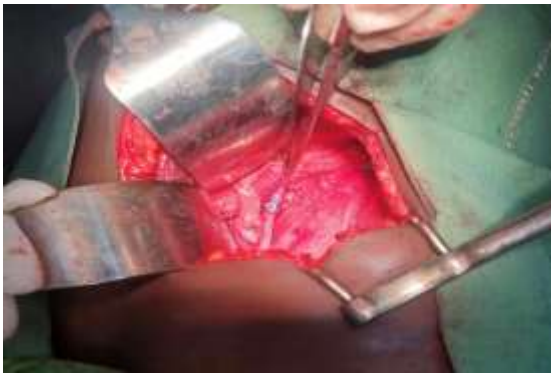

Figure 4: JJ stent placement followed by ureteropelvic anastomosis

Figure 5: Resected ureteropelvic junction specimen

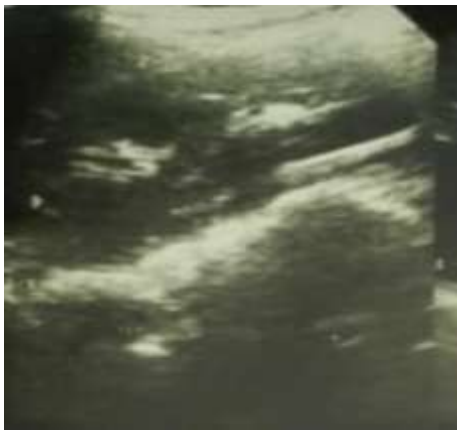

Fig 6: echo control, absence of dilation

DISCUSSION

Open pyeloplasty using the Kuss-Anderson-Hynes technique remains the gold standard for treating UPJS, with a success rate between 90% and 100% [7]. In our case, the patient was 20 years old, similar to findings by A.A. Diarra *et al*. [8], who reported a mean age of 25.5 years (range: 6–45 years). However, our patient was older than those in the study by R.B. Galifer *et al*. in Paris, with a mean age of 4.9 years, likely due to their study being conducted in pediatric hospitals [9].

Most authors report a male predominance (55–75%, sex ratio >2:1). In our case, the patient was female, differing from results by Bernard Boillot [10] and B. Frémond [11], who both reported a 65% male prevalence. Left-sided involvement was most frequent in our study, aligning with findings from Boillot and Dr. Antoine Mboyo (60% left-sided) [10, 12], but differing from Chiarenza *et al*. and Veyrac *et al*., who noted a slight right-sided predominance. Bilateral lower polar vessels were found in only 4% of Veyrac's cases [13, 14].

Our patient had a long history (10–15 years) of symptoms before urological evaluation, reflecting a lack of awareness about UPJS among healthcare providers. During remission phases, other conditions may be mistakenly suspected. She also had a history of appendectomy without resolution of her pain, similar to R.B. Galifer *et al*., who reported appendectomy of a normal appendix in 5% of cases [9].

Voiding symptoms were noted, consistent with Avakoudjo *et al*. [15] (33% prevalence of infections), but differing from Diarra A.A. [16], who reported no voiding symptoms in 46.2% of cases. We performed resection of the stenotic ureter and renal pelvis remodeling via the AndersonHynes technique, with antegrade JJ stent insertion using a Terumo guidewire. This contrasts with Papalia and Simone [17], who preferred retrograde stent insertion to reduce operative time, although endoscopic stent placement time was not included in their operative duration.

CONCLUSION

Ureteropelvic junction syndrome remains a poorly recognized condition among general healthcare providers. CT urography is the gold standard diagnostic tool. The Anderson-Hynes pyeloplasty continues to be the reference surgical treatment for UPJS.

Declaration of interests: The authors declare that they have no conflicts of interest regarding this article.

Declaration of approval: The patient agreed and gave her consent for the publication of the images.

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