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Case Report

Spontaneous urinoma associated with ureteropelvic junction obstruction, solved by laparoscopic pyeloplasty: a case report

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ABSTRACT

Urinoma, a collection of extravasated urine in the perirenal or retroperitoneal space, often arises from obstructive uropathy, particularly in pediatric patients with congenital anomalies. This case report details a 15-year-old male presenting with acute abdominal pain due to ureteropelvic junction obstruction (UPJO), leading to a perirenal urinoma. The report outlines the clinical presentation, diagnostic challenges, and surgical management involving laparoscopic pyeloplasty. Despite postoperative complications, including hydronephrosis and the need for nephrostomy, the patient achieved successful outcomes with no recurrence of UPJO. This case emphasizes the complexities of diagnosing urinoma and the importance of tailored management strategies in similar cases.

Keywords: Spontaneous urinoma, Urinoma, Laparoscopic pyeloplasty

INTRODUCTION

Urinoma, is defined as a collection of extravasated urine in the perirenal or retroperitoneal space, is a rare but clinically significant condition that often arises due to obstructive uropathy. In pediatric populations, especially, the incidence of urinoma can be linked to congenital anomalies such as ureteropelvic junction obstruction (UPJO) or posterior urethral valves. Although typically asymptomatic at first, urinomas can manifest with non-specific symptoms, including abdominal pain, nausea, and signs of peritoneal irritation, which can lead to significant diagnostic challenges.

In this case report, we present a 15-year-old male with no prior urinary symptoms who developed acute abdominal pain secondary to UPJO, ultimately leading to the formation of a perirenal urinoma. The case details the clinical presentation, diagnostic workup, and surgical management of this uncommon condition. The patient's journey highlights the complexities involved in diagnosing and treating urinomas, particularly when associated with UPJO, and underscores the need for careful surgical planning to navigate the inflammatory changes that complicate the anatomical landscape.

Management of urinomas remains controversial due to the absence of established guidelines, and treatment strategies often depend on the underlying cause of the urinary leak. In cases of UPJO, laparoscopic pyeloplasty is frequently considered the gold standard of care. However, the presence of a urinoma complicates the surgical approach due to the inflammatory response and potential fibrosis.

This report aims to contribute to the existing literature on urinomas by detailing the clinical presentation, surgical challenges, and outcomes of laparoscopic pyeloplasty in the context of a urinoma secondary to UPJO, thereby providing insights into effective management strategies for similar cases in the future.

CASE REPORT

A 15-year-old male previously healthy, deny any previous urinary symptoms and does not have urinary abnormalities on prenatal ultrasound.

Patient was admitted to the emergency department due to a 3-day history of generalized abdominal pain in the right lower quadrant, accompanied by chills, anorexia and nausea. Physical examination showed signs of peritoneal irritation and blood test with leukocytosis, neutrophilia, creatinine 2.37 mg/dl and urea 35.5 mg/dl. Abdominal ultrasound shows grade IV right hydronephrosis (Figure 1), suggestive of UPJO, and the presence of a perirenal urinoma that dissects the retroperitoneum (Figure 2).

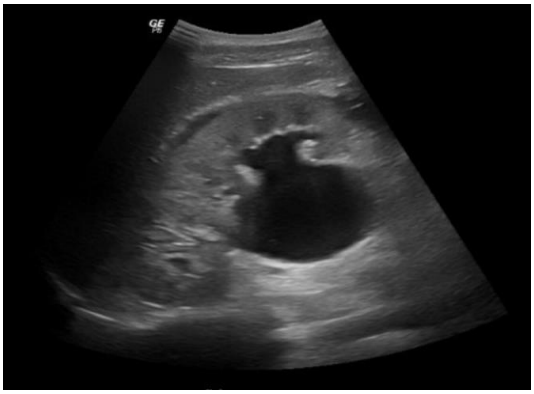

Figure 1: Grade IV hydronephrosis.

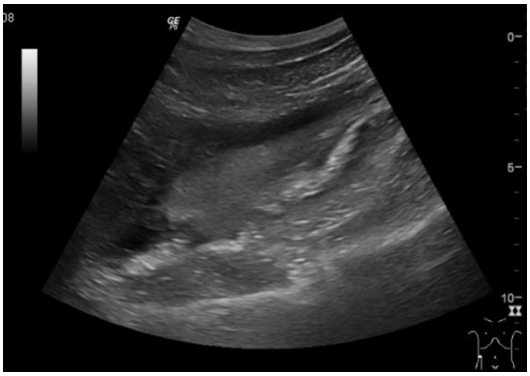

Figure 2: Retroperitoneal urinoma.

Due to the contraindication of a contrasted study, an ascending pyelogram was performed and evidenced a urinary leakage in the renal pelvis (Figure 3). We proceed to place a double J catheter 5 Fr×24 cm without any complications, improving abdominal symptoms and renal function test. He was scheduled for laparoscopic pyeloplasty.

Surgical technique

A transabdominal laparoscopic approach with 3 ports (12 mm, 5 mm and 5 mm), then the retroperitoneum is accessed through Toldt's fascia, the colon and duodenum are medialized without incident, the ureter is dissected, 25 cc of murky urine is drained, finding significant inflammatory pyelitis that makes difficult dissection because it modifies the anatomic plane; after completely dissected, the stenotic site was identified, and resected (Anderson-Hynes technique), both proximal and distal ends were spatulated, performing end-to-end anastomosis starting with the posterior plate in a "spiral flap" with 4-0 Vycril (Figure 4), a transabdominal double J catheter is placed anterogradely, and then the anterior plate is sutured, no reduction of pelvis was done, then laparoscopic ports were removed and the surgical procedure is ended without any apparent complications.

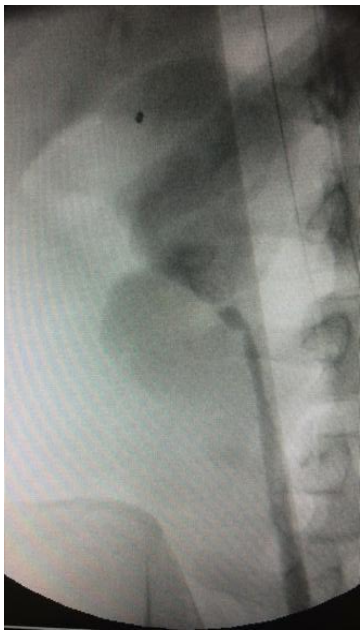

Figure 3: Retrograde pyelography with urinary leakage.

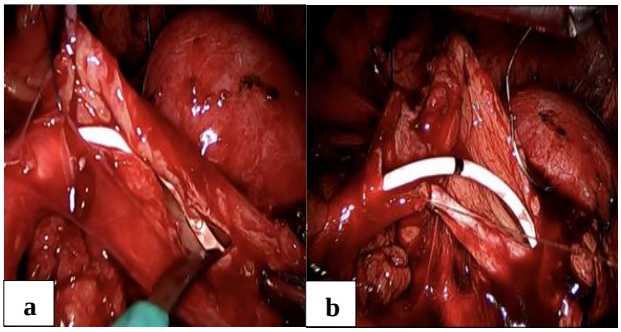

Figure 4 (a and b): Anderson-Hynes pyeloplasty.

Three weeks after the surgical procedure, the patient was re-admitted to the emergency department with abdominal pain, so an abdominal computed tomography (CT) scan was performed, there were no urine leakage but severe hydronephrosis was observed. So, a right percutaneous nephrostomy was performed for suspected dysfunction of the double J catheter, which is placed just at the level of pyeloplasty (Figure 5).

Eight weeks after pyeloplasty, double J catheter was removed, also we made a retrograde ballon dilatation at the anastomosis level, the nephrostomy was removed a month later after anterograde pyelography shows adequate clearance (Figure 6).

Patient shows adequate surgical and radiologic results after 2 years, without UPJO recurrence.

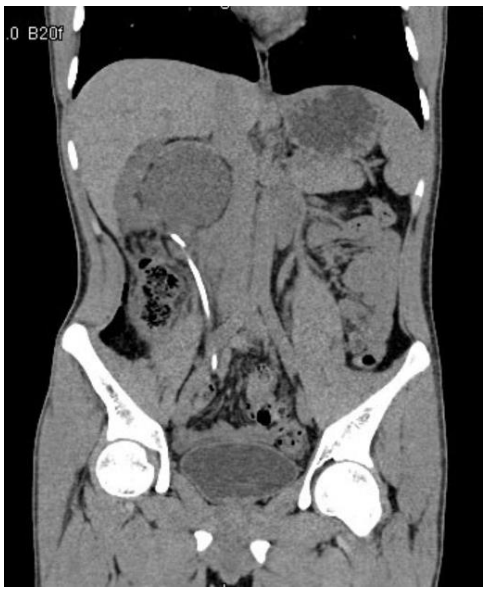

Figure 5: Abdominal CT scan shows hydronephrosis secondary to dysfunction of the double J catheter placed just over the pyeloplasty without urinary leakage.

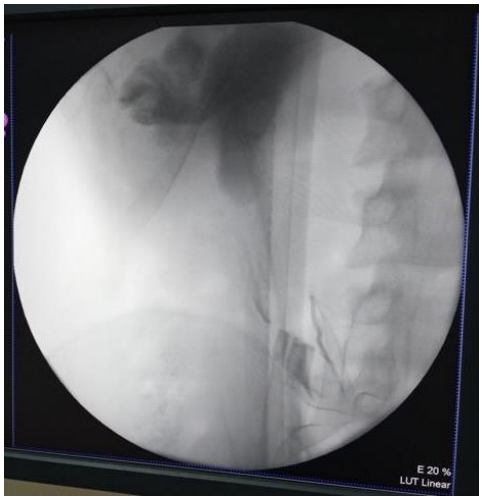

Figure 6: Retrograde pyelography previous to balloon dilatation.

DISCUSSION

The urinoma is a very rare condition due to extravasation of urine from the urinary tract after the collapse of the pressure compensatory mechanism of renal, ureteral or bladder dilatation. The urinary leak is abrupt, secondary to the increase of intracavitary pressure that can occur acutely or chronically.[1] When it occurs at the renal level due to an intrinsic or extrinsic obstructive process of the urinary tract, intraluminal pressure in the collecting systems increase from normal values below 20 mmHg to levels above 75 mmHg, generating a perforation in the walls of the kidney cavities, generally in the renal fornix, which are considered to be the weakest part, causing the outflow of urine to the renal fascia, creating an intense inflammatory reaction with lipolysis and leading to form a fibrous capsule.[1] There are different causes that can lead to the formation of a urinoma including renal malformations, closed or penetrating traumatic injuries, obstructions of the urinary tract and only in a few cases it occurs spontaneously.[2-4]

In pediatrics, the most frequent description corresponds to newborns with posterior urethral valves or UPJO; between 3 to 17% may present a urinoma.[5,6] In adults, the etiology is diverse, among the lesions that cause urinomas, those secondary to obstructive uropathy (ureteral lithiasis, retroperitoneal fibrosis or bladder obstruction), abdominal trauma involving urinary tract, chronic inflammatory processes, lithotripsy, complications associated with surgical procedures such as nephrostomy or renal biopsy.[3,4,7] The renal location tends to involve the subcapular region, perirenal space, retroperitoneum and can even affect the intraperitoneal cavity or mediastinum, by ultrasonography, it has an anechoic cystic figure. The tomographic study is usually diagnostic. The differential diagnoses include appendicitis, cholecystitis, diverticulitis, and urinary stones.[8-10]

Clinically, the patient may show nonspecific symptoms, that can range from asymptomatic with normal physical exploration, to non-specific symptoms, such as nausea, vomiting, generalized abdominal pain with sings of peritoneal irritation, or a palpable mass, usually with electrolyte disturbances like hyperkalemia, hyponatremia, metabolic acidosis, increased of serum levels of creatinine and urinary nitrogen, due to the gradient difference between extravasated urine and plasma resembling a patient with acute renal failure in 70-85% of cases. The evolution can lead to complications such as urosepsis, permanent hydronephrosis, paralytic ileus or abscesses with deterioration of renal function.[7]

Management

There are no guidelines or consensus for the management of urinoma and although spontaneous resolution has been described, management with antibiotics and analgesics is only reserved for stable patients; however, subsequent intervention may be required. The choice of the final treatment is directed according to the underlying cause, nephroureterectomy is not indicated if renal function is preserved and the obstructive process must be solved; a common surgical option when the cause of the urinoma is a UPJO, is to perform a pyeloplasty, but the presence of a urinoma makes a challenging case, because is difficult to

identify the anatomical borders due to the intense inflammatory reaction, so various approaches to urinary diversion have been proposed before the pyeloplasty, among them the endourological procedure and the placement of a double J ureteral catheter are usually the one of choice.[11] This procedure facilitates the reabsorption of the urinoma from the perirenal space and with a tomography 4 weeks later the resorption of the urinoma can be observed but the fibrosis persists.[10]

Laparoscopic, robotic versus open pyeloplasty

The different factors to consider when choosing the surgical technique should be the availability of surgical resources, as well as the experience of the surgeons.[12,13]

There are different options for the management of UPJO including laser endopyelotomy, hydropneumatic balloon dilation, abdominal or retroperitoneal pyeloplasty, and ureterocalicostomy. The Anderson-Hynes pyeloplasty is considered the gold standard.[14] In situations where there is a recurrence of UPJO, after pyeloplasty, the laparoscopic or robotic approach has shown a higher success rate than the open option or any other options, however there are no surgical descriptions that show advantages of any surgical technique after the presence of a renal urinoma.[15]

The antecedent of a urinoma complicates the surgical scenario secondary to the retroperitoneal fibrosis generated by the extravasation of urine, and the formation of a pseudocyst.[15,16] As we describe, the usual surgical management is Anderson Hynes pyeloplasty, the surgical principle is based in identifying and resect the stenotic area between the junction of the renal pelvis and the ureter itself, which is dissected and spatulated laterally at least 1 cm towards the ureter, the renal pelvis, should be positioned in a way that facilitates urine drainage, the resection of the redundant pelvis is still controversial.[15-17]

CONCLUSION

Urinoma is a rare entity usually secondary to an obstructive precipitating factor, being the spontaneous form even rarer, is an entity difficult to diagnose and threat because the lack of guidelines or consensus, also when is associated to UPJO, generates a surgical challenging cases for pyeloplasty due to the technical difficulties, secondary to generalized inflammation and fibrosis, the laparoscopic pyeloplasty seems to be a safe and efficient option for the resolution.

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