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ZINNER'S SYNDROME AND RETROPERITONEAL FIBROSIS: AN UNKNOWN ASSOCIATION

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ABSTRACT

We report the case of a 24-year-old male presenting with obstructive renal failure, characterised by imaging evidence of a cystic lesion contingent upon the seminal vesicle and concurrent renal agenesis. Initial management involved urinary diversion, followed by outpatient monitoring and subsequent recurrence. Subsequent diagnostic assessments led to the identification of Zinner's syndrome, accompanied by retroperitoneal fibrosis. We present the clinical course, diagnostic methodology and the efficacious implementation of medical-surgical therapeutic interventions, yielding favourable outcomes.

KEYWORDS

Zinner's syndrome, retroperitoneal fibrosis, rare diseases, renal failure, methotrexate

LEARNING POINTS

- The value of the Internal Medicine team in the assessment of low prevalence diseases.
- The importance of multidisciplinary teams.
- Integration of the internists in the surgical teams.

INTRODUCTION

Zinner's syndrome (ZS) is a congenital anomaly of the urogenital tract of unknown aetiology in males, first described in 1914 by Zinner[1]. It involves the triad of obstructed ejaculatory ducts, ipsilateral renal agenesis and the presence of cysts in the seminal vesicles. This condition has a prevalence of approximately 0.0046%, with 214 cases reported in the literature[2]. It is often incidentally discovered in individuals typically between the second and fourth decades of life, a trend changing with the earlier use of imaging studies.

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CASE DESCRIPTION

The patient is a 24-year-old male from Madrid, Spain, with no known allergies or relevant medical history except for smoking (2.4 packs/year). He presented to the emergency department with a 15-day history of constipation, left hemi-abdominal pain refractory to conventional analgesia, nausea, vomiting, abdominal distension and postprandial fullness. No changes in bowel or urinary habits, and no fever or systemic symptoms were reported. On arrival, he was haemodynamically stable with tenderness in the left upper lumbar paravertebral area.

Laboratory results showed a normal blood count, serum biochemistry with a creatinine of 6.20 mg/dl and modification of diet in renal disease (MDRD) 4 of 11 ml/min/1.73m^2. Liver enzymes and ions were within range and C-reactive protein was 2.7 mg/dl. Venous blood gas was normal; urinalysis was also unremarkable.

A urinary catheter was inserted, and an abdominal ultrasound revealed left-sided hydronephrosis in a solitary kidney (right renal agenesis) without an identified obstructive cause. An urgent contrast-enhanced abdominal CT scan *(Fig. 1A)* showed a lobulated cystic lesion arising from the right seminal vesicle, likely of congenital origin.

The patient was assessed by the Urology Department, who opted for urgent placement of a double-J catheter and hospitalisation. The procedure was uneventful, and the patient improved; he was subsequently discharged with a creatinine of 1.2 mg/dl for outpatient follow-up.

A follow-up MRI revealed a complex right pelvic cystic lesion measuring 6 cm, likely corresponding to a cyst of the vas deferens, with a thick and irregular wall *(Fig. 1B and 1C)*.

A PET-CT showed increased retroperitoneal soft tissue extending to a known right pelvic cystic lesion, continuous with the seminal vesicle *(Fig. 2A and 2B)*. Increased fluorodeoxyglucose (FDG) uptake was noted in soft tissue and the cystic lesion wall, along with a small lymph node with mild metabolism in the right external iliac chain, potentially related to the previously described lesion. Additionally, left ureteropelvic dilatation was observed, with a known right renal agenesis. No other significant findings were noted.

During outpatient follow-up, creatinine increased to 4 mg/dl, prompting hospital admission for urinary tract diversion. Due to the progression of the retroperitoneal mass despite the double-J catheter, left percutaneous nephrostomy was performed.

Further laboratory investigations during admission, including autoimmune panel (antinuclear antibody (ANA), antineutrophil autoantibodies (ANCA), complement); Mantoux test, smears, proteinogram, IgG subclasses, lactate dehydrogenase (LDH) and beta 2-microglobulin were negative. Considering the PET-CT findings and the extension of the lesion, two differential diagnoses were proposed:

1. Idiopathic retroperitoneal fibrosis (Ormond's disease type B/IgG4-mediated);
2. Combined renal agenesis and pelvic cyst (possible seminal vesicle) related to embryonic remnants, secondary to Wolffian duct embryogenesis alterations (ZS), potentially inflamed.

Given the severe ureteral stenosis in a monorenal patient and active inflammation on PET-CT, intravenous

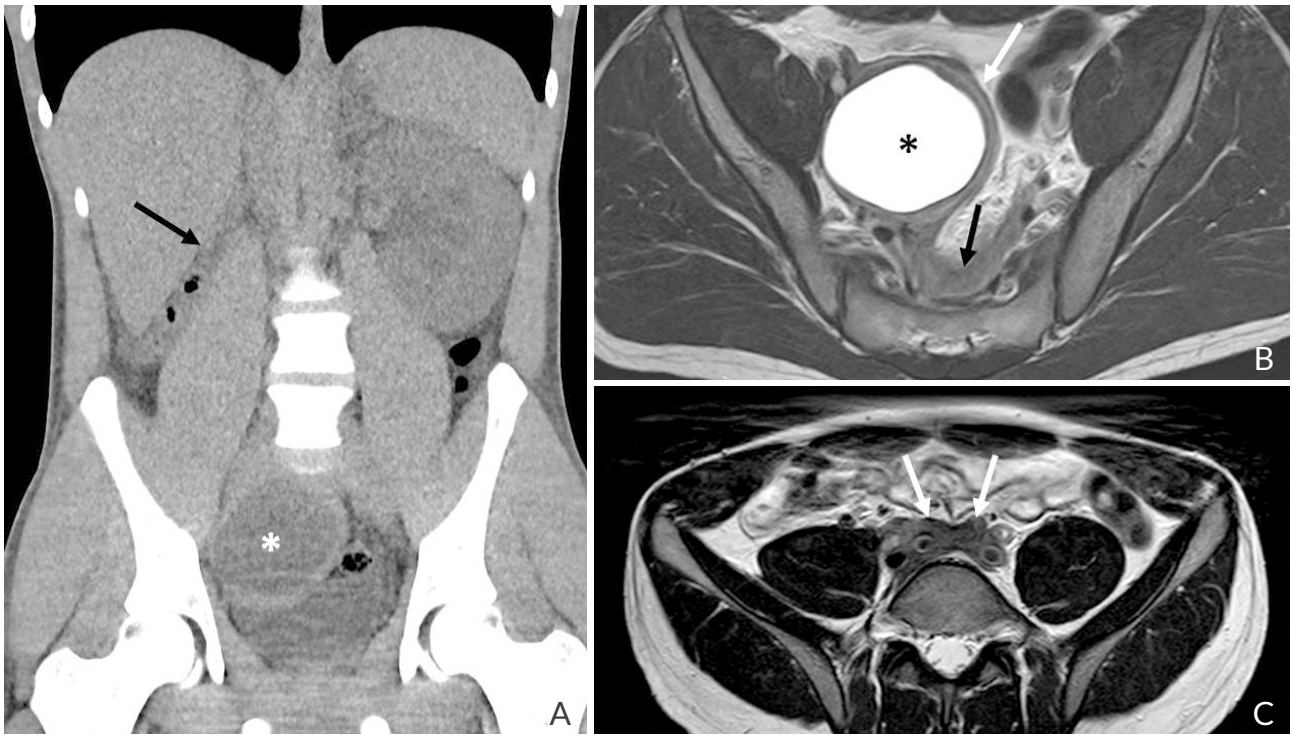

Figure 1. A) Coronal reconstruction of low-dose radiation CT showing the absence of the right kidney (black arrow) and a cystic lesion in the right hemipelvis (*). B) Axial T2-weighted image of the pelvis demonstrating a cystic lesion in the right hemipelvis, theoretically located in the seminal vesicle area. Its walls are thickened (white arrow), and a soft tissue component extending into the presacral region is observed (black arrow). C) Axial T2-weighted image of the pelvis (cranial to the anterior cut) identifying a soft tissue component (white arrows) surrounding the common iliac vessels.

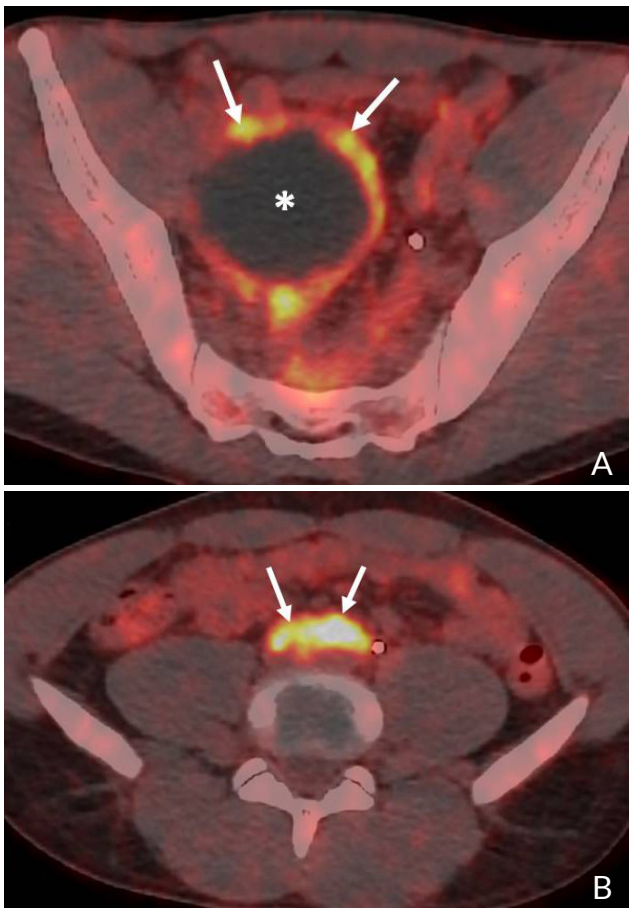

Figure 2. A) Axial PET-CT scan showing a cystic lesion in the pelvis (*) with focal FDG uptake in its wall (white arrows). B) Axial PET-CT scan (cranial to the anterior) revealing a soft tissue component with FDG uptake (white arrows) surrounding the distal third of the aorta and the inferior vena cava.

methylprednisolone pulses were initiated, followed by oral maintenance therapy. However, due to the atypical age for idiopathic retroperitoneal fibrosis and the possibility of embryonic remnants malignancy or other aetiologies, a clinical decision was made to perform a biopsy on the lesions. An intraoperative biopsy of fibrous tissue was reported as neoplasm-free, and the seminal vesicle cyst was excised. The final biopsy results indicated fragments of a simple cyst wall without malignancy or significant histological findings, along with fibroadipose tissue with discrete clusters of neutrophils and numerous small vessels, showing no evidence of lymphoproliferative infiltration. Confirmation of storiform fibrosis and IgG4-predominant lymphoplasmacytic infiltrate, typical of IgG4-related disease, was not possible.

The patient recovered well, with normalised creatinine, and was discharged for outpatient follow-up. Methotrexate treatment was initiated, and corticosteroids were gradually tapered off over four months. A follow-up PET-CT at six months reported metabolic normalisation and a reduction in the size of the retroperitoneal and pelvic soft tissue mass, continuous with the previously described right pelvic cystic lesion *(Fig. 3A and 3B)*. There was also a significant decrease in left ureteropelvic dilatation and the previously noted small lymph node in the right external iliac chain.

DISCUSSION

Zinner's syndrome (ZS) is associated with abnormal embryonic development between the fourth and thirteenth weeks, affecting the distal portion of the mesonephric or Wolffian duct. Incomplete migration of the ureteric bud results in the formation of the kidney, ureter, seminal vesicle, and vas deferens. This process interferes with metanephric blastema differentiation, causing ipsilateral renal agenesis and ejaculatory duct atresia, leading to seminal vesicle distension and the formation of a cystic structure[3].

Most patients with ZS are asymptomatic, but those with symptoms commonly experience haematuria, haematospermia, dysuria and discomfort in the perineal and hypogastric regions. Diagnosis is typically achieved through imaging studies such as abdominal and transrectal ultrasound, CT and MRI, with the latter being particularly useful for studying soft tissues and discerning cystic content and establishing relationships between different findings.

A potential malignancy risk of approximately 5% has been reported[2]. Asymptomatic cases often undergo conservative

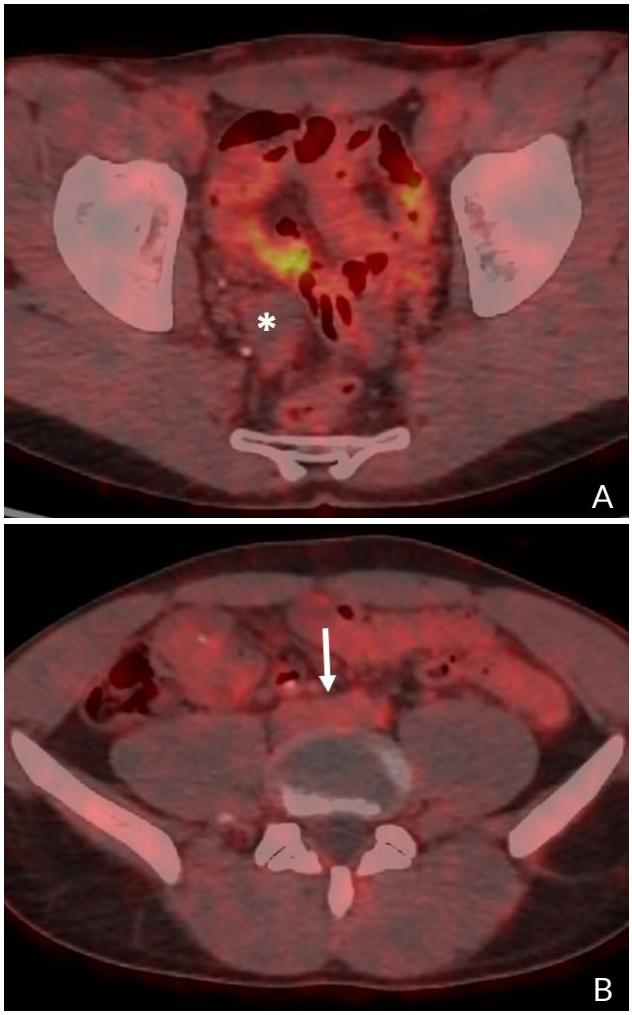

Figure 3. A) Axial PET-CT scan demonstrating a very significant reduction in the size of the cystic lesion in the pelvis (*) and disappearance of the focal FDG uptake in its wall. B) Axial PET-CT scan (cranial to the anterior) showing the disappearance of the soft tissue component that surrounded the distal third of the aorta and the inferior vena cava.

management unless malignancy is suspected. Surgical intervention is indicated for cysts equal to or larger than 2.5 cm, those with suspected malignancy or clinical involvement, including infertility. Laparoscopic vesiculectomy is considered the safest and most effective procedure but other approaches, such as transrectal and perineal cyst puncture and drainage have been described, albeit with an increased risk of recurrence and infections[4].

Endoscopic ureteral management has been proposed for infertility cases, but surgical interventions have shown higher success rates[5]. Differential diagnosis should include other pelvic cystic lesions such as lateral prostatic cysts, ectopic ureterocoele, abscesses and vas deferens duct diverticulosis.

No known association between idiopathic retroperitoneal fibrosis (IRF) and ZS has been reported in the literature. However, inflammation related to embryonic remnants might act as a trigger for IRF. Since our patient was 24 years old, younger than typical IRF cases (usually in the 5th and 6th decades) and considering the possibility of malignant transformation or other aetiologies, a decision was made to perform biopsies.

Intraoperative biopsy results did not indicate neoplastic findings, and the patient's recovery was favourable. However, confirmation of IgG4-related disease was inconclusive. Treatment with methylprednisolone pulses, methotrexate and corticosteroid tapering was initiated, and the patient showed improvement during follow-up.

This case highlights the complexity of ZS and the challenges in diagnosis and management, especially when associated with additional conditions such as IRF. A multidisciplinary approach involving Urology, Radiology and Rheumatology departments played a crucial role in determining the appropriate interventions and achieving a positive outcome for the patient. Further research and collaboration are necessary to better understand the potential associations between ZS and other rare conditions, guiding clinicians in optimal patient care.

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