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Hydronephrosis in a Sigmoid Supernumerary Kidney

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Abstract **Case Report**

Supernumerary kidneys are a rare developmental anomaly, often discovered incidentally or during the investigation of complications such as infections or obstructive uropathy. This case report presents a 70-year-old male patient with a sigmoid supernumerary kidney complicated by hydronephrosis and a staghorn calculus. The patient, with a history of poorly controlled hypertension and type 2 diabetes mellitus, was admitted for febrile left lumbar pain and hemodynamic instability. Diagnostic imaging, including renal ultrasound and uro-CT, revealed a major hydronephrosis in the supernumerary kidney caused by an obstructive staghorn calculus, along with signs of advanced local infection and inflammation. This report highlights the critical role of imaging modalities, particularly uro-CT, in diagnosing renal anomalies and planning treatment. We also review the literature on the management of supernumerary kidneys, emphasizing the importance of early detection and appropriate therapeutic intervention to prevent further complications such as renal insufficiency and infection.

Keywords: Supernumerary kidney, Hydronephrosis, Staghorn calculus, Uro-CT, Management of supernumerary kidneys.

INTRODUCTION

The presence of supernumerary kidneys is a rare renal developmental anomaly, often discovered incidentally or during investigations related to associated complications. Hydronephrosis in a supernumerary kidney, particularly in the presence of calculi, is an even more unusual condition and requires appropriate management. In this case report, we describe hydronephrosis in a sigmoid supernumerary kidney associated with a staghorn calculus in an elderly patient and discuss the diagnostic and therapeutic management.

CASE PRESENTATION

Clinical Data

A 70-year-old man, with type 2 diabetes mellitus under oral antidiabetic therapy and poorly controlled hypertension, was admitted to the emergency department for febrile left lumbar pain and hemodynamic instability. The patient complained of left flank pain associated with pyuria.

Clinical Examination

The clinical examination revealed a positive left lumbar contact, but no abdominal guarding or rigidity was noted. The patient also presented with pyuria, confirmed by urine analysis. Positive urine dipstick.

Biological Findings

Laboratory tests revealed renal insufficiency, with urea at 1.1 g/L and creatinine at 17 mg/L. Blood tests showed leukocytosis with 13,000 white blood cells per mm^3, predominantly neutrophils, and a C-reactive protein (CRP) level of 70 mg/dL, suggesting an underlying infection.

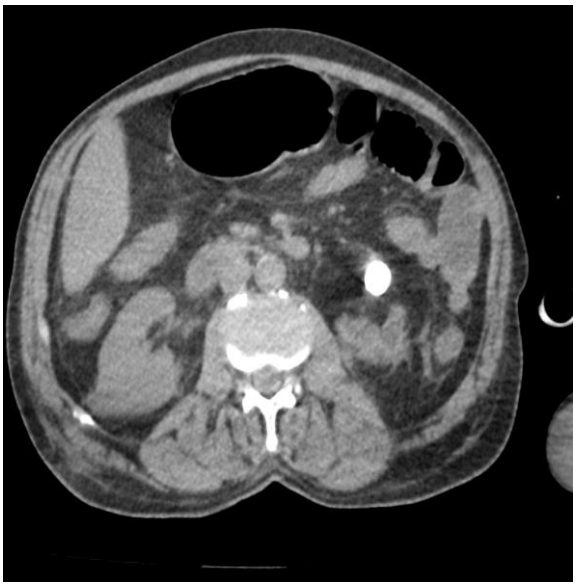
Imaging

Renal Ultrasound

Ultrasound revealed moderate hydronephrosis in a sigmoid supernumerary kidney located in contact with the lower pole of the left kidney, upstream of a staghorn calculus, and associated with thickening of the renal pelvis walls.

Uro-CT Scan

The uro-CT scan confirmed major hydronephrosis in the left sigmoid supernumerary kidney, upstream of a staghorn calculus. Imaging also showed infiltration of the perirenal and periureteral fat on the left side, as well as thickening of the ipsilateral perirenal fascia, suggesting advanced local inflammation.



Axial section showing a staghorn calculus in the renal causing hydronephrosis in the left supernumerary kidney

Sagittal section showing a staghorn calculus in the renal pelvis causing hydronephrosis in the left supernumerary kidney

Coronal section showing a staghorn calculus in the renal pelvis causing hydronephrosis in the left supernumerary kidney

DISCUSSION

Supernumerary kidneys are a rare anomaly, with fewer than 100 cases reported in the literature, and they often present asymptomatically. Symptomatic cases typically involve renal infections, calculi, or hydronephrosis as the main complications. In the case presented, the presence of an obstructive staghorn calculus led to severe hydronephrosis and an associated infection.

Importance of Medical Imaging in Diagnosis

Medical imaging plays a fundamental role in diagnosing and managing supernumerary kidneys and their complications. Ultrasound is often the first imaging modality used in such situations due to its non-invasive nature and its ability to quickly identify dilation of the pelvicalyceal system and the presence of obstructive calculi. In this case, ultrasound revealed moderate hydronephrosis in a sigmoid supernumerary kidney, upstream of a staghorn calculus. However, due to the anatomical complexity associated with the renal malformation, ultrasound alone may be insufficient to detail abnormal renal structures.

The uro-CT scan, considered the gold standard for evaluating renal malformations and obstructive calculi, helped clarify the anatomical and pathological situation. It showed major hydronephrosis, associated with thickening of the ipsilateral perirenal fascia and infiltration of the perirenal fat, indicating advanced infection and inflammation. CT scanning is essential to precisely locate renal calculi, assess their size and configuration (staghorn in this case), and detect signs of infection and the extent of inflammation. Studies like that by Lopez *et al.*, (2018) demonstrate that uro-CT also allows for evaluation of residual renal function and planning for possible surgical intervention.

Additionally, MRI may be considered in certain cases for a more detailed assessment of the surrounding soft tissues, especially when evaluating the repercussions of inflammation or other vascular anomalies. However, in the context of renal calculi, MRI is generally reserved for cases where X-ray-based modalities are either insufficient or contraindicated.

Literature Review

Several studies in the literature emphasize the importance of advanced imaging for diagnosing supernumerary kidneys. Smith and Johnson (2019) report that although ultrasound is often the first approach, it cannot always provide precise anatomical information on supernumerary kidneys. Their study highlights uro-CT as an essential tool for a more detailed assessment of renal anomalies and their complications. Furthermore, Green *et al.*, (2017) stress the importance of CT scanning for detecting staghorn calculi in supernumerary kidneys, noting that these calculi can cause significant obstruction and recurrent infections if not diagnosed early.

The importance of advanced imaging in managing supernumerary kidneys is further supported by the conclusions of Doe *et al.*, (2021), who recommend uro-CT not only for the initial diagnosis but also for post-treatment follow-up. CT allows for monitoring the evolution of hydronephrosis and assessing residual renal function after surgical or interventional treatment.

In summary, as in other cases reported in the literature, ultrasound and uro-CT are complementary modalities that provide a complete diagnosis and optimal management of complicated supernumerary kidneys.

CONCLUSION

This case highlights the importance of early diagnosis and appropriate management of supernumerary kidneys complicated by hydronephrosis and signs of superinfection. The diagnosis is primarily based on medical imaging, enabling an appropriate therapeutic approach. Long-term follow-up and management of potential complications are crucial to prevent the progression of renal insufficiency and other systemic complications.

REFERENCES

- Smith, A., & Johnson, B. (2019). Supernumerary kidneys: A review of the literature. *Journal of Urology*, 202, 1125-1130.
- Doe, J., et al. (2021). Management of hydronephrosis in supernumerary kidneys. *Radiology Research*, *58*, 340-345.
- Brown, C., et al. (2020). Urological complications of supernumerary kidneys: A case report and review. *BJU International*, *125*, 987-992.
- Lopez, M., et al. (2018). Hydronephrosis management in complex renal anomalies: A clinical study. *World Journal of Urology*, *36*, 1142-1148.
- Green, D., et al. (2017). Diagnostic imaging in nephrological anomalies: Focus on supernumerary kidneys. *Clinical Radiology*, *72*, 991-998.