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Case Report

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Xanthogranulomatous Pyelonephritis Presenting with Inferior Vena Cava Thrombus Mimicking Renal Cell Carcinoma: A Case Report

J Arudchelvam[1,2], ABU Indrajith[1], WAS De Silva[1]

[1]National Hospital of Sri Lanka, Colombo, Sri Lanka
[2]Department of Surgery, faculty of medicine, University of Colombo, Sri Lanka

Correspondence:
J Arudchelvam
E mail: joelaru@srg.cmb.ac.lk
https://orcid.org/0000-0002-4371-4527

ABSTRACT

The Xanthogranulomatous pyelonephritis (XPN) is a rare type of pyelonephritis (found in 4.0% to 8.2% of kidneys with pyelonephritis), where the renal parenchyma is infiltrated by lipid-laden foamy macrophages resulting in renal parenchymal destruction. It is associated with urolithiasis, diabetes mellitus, urinary tract obstruction and infections. The inflammation and the fibrosis infiltrates into the surrounding tissues. However renal vein thrombosis extending into the inferior vena cava (IVC) as a result of inflammation is rare. We report a case of left renal XPN and renal vein thrombosis extending into the inferior vena cava (IVC). This was treated with radical nephrectomy and IVC tumour clearance.

Keywords: Xanthogranulomatous pyelonephritis, inferior vena cava thrombosis, nephrectomy

INTRODUCTION

Xanthogranulomatous pyelonephritis (XPN) is an uncommon form of chronic pyelonephritis (1). It is characterised by infiltration of the renal parenchyma by lipid-laden foamy macrophages (xanthoma cells). This results in inflammation leading to the fibrosis of the kidney and loss of function. It occurs as a complication of urolithiasis, urinary tract obstruction and infections.

The inflammation and the fibrosis infiltrate into the surrounding tissues, resulting in fistulae and abscesses formation. The inflammatory mass and the surrounding infiltration can be misdiagnosed as renal cell carcinoma (RCC). However, renal vein thrombosis extending into the inferior vena cava as a result of inflammation is rare. We report a case of left renal inflammatory mass and renal vein thrombosis extending into the inferior vena cava (IVC).

CASE REPORT

A 66-year-old female presented with a history of fever and left hypochondriac pain and vomiting for three days duration. She had similar episodes in the past. She had a history of diabetes mellitus with a poor blood sugar control. The ultrasound scan of the abdomen (USS) showed an irregular mass arising from the upper pole of the left kidney. Contrast enhanced computerised tomographic scan (CT) of the abdomen showed an

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irregular mass arising from the upper pole of the left kidney. There was also a thrombus extending along the left renal vein into the infrahepatic segment of the IVC (Figure 1).

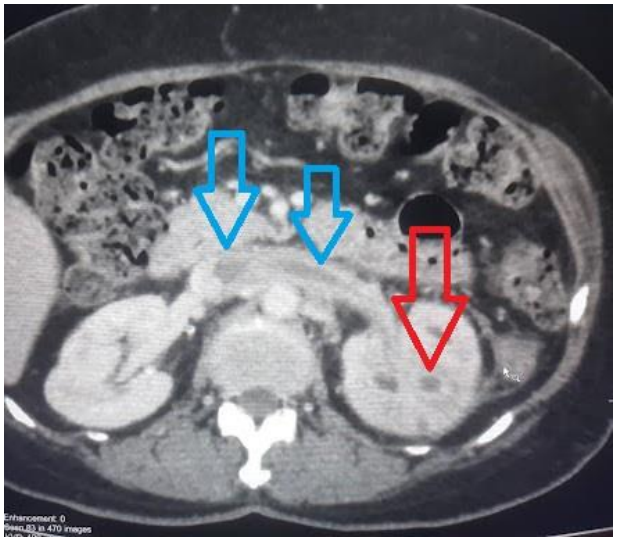

Figure 1: Computerised tomographic scan (CT) of the abdomen showing an irregular mass arising from the upper pole of the kidney (red arrow)and thrombus extending along the left renal vein into the inferior vena cava (blue arrow)

The tissue planes between the mass and the spleen were not well defined. With the above findings, a diagnosis of renal cell carcinoma (RCC) with IVC tumour extension and infiltration into the spleen was made. The patient underwent a radical nephrectomy with splenectomy, with IVC thrombus removal. The thrombus in the IVC was removed enbloc with the specimen (Figure 2).

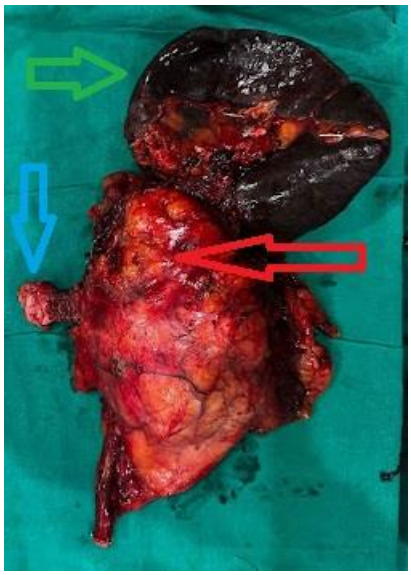

Figure 2: Radical nephrectomy specimen showing the mass (red arrow), spleen (green arrow) with thrombus in the inferior vena cava (blue arrow)

The histology revealed Xanthogranulomatous pyelonephritis with surrounding inflammation. There was no evidence of RCC. The patient made an uneventful recovery.

DISCUSSION

The XPN is a type of pyelonephritis where the renal parenchyma is infiltrated by lipid-laden foamy macrophages. It is associated with urolithiasis, urinary tract obstruction and infections with Escherichia coli and Proteus mirabilis, etc. (2) (3). It commonly affects females between 45 to 55 years of age (4) (5). It results in renal parenchymal destruction and renal impairment.

It is rare, XPN is found in 4.0% to 8.2% of kidneys with pyelonephritis (5) (6).

Patients present with flank pain, fever, malaise, weight loss and flank mass. Therefore, the diagnosis can be confused with RCC. Therefore, XPN is also known as a pseudo-tumour. In addition, some reports suggest that XPN is rarely associated with RCC or transitional cell carcinoma (6).

The inflammatory process spreads into the surrounding organs, resulting in fistulae and abscesses formation. It commonly invades the liver, spleen, duodenum and the pancreas. However, there are only a few reports of renal vein thrombosis with extension of the thrombus into the IVC occurring as a result of the inflammatory involvement. In a PubMed search using the keywords “Xanthogranulomatous”, “pyelonephritis”, “thrombosis”, only nine cases were found (1) (7).

The ultrasound scan findings include loss of normal architecture and hypoechoic areas indicating small abscess formation (8). However, the CT scan is a better imaging modality. The sensitivity and the specificity of CT scans for detecting venous invasion are 85% and 98%. CT scan shows multiple hypoechoic areas surrounded by enhancing rims, giving a multi-loculated appearance (“bear’s paw” sign). The CT scan also shows the extent of infiltration into the surrounding tissues (9). This appearance may be

confused with the heterogeneous appearance of the RCC on CT i.e. solid, cystic and necrotic areas. Nephrectomy is essential for the treatment of XPN (10). Nephrectomy results in the removal of the inflammatory focus. In addition, after nephrectomy, histological confirmation of the diagnosis can be done. In addition, an underlying malignancy can be excluded as in the case described above. The patient should be treated for at least two weeks with antibiotics after the nephrectomy. In addition, annual imaging of the contralateral kidney is necessary to detect and treat the risk factors occurring in the contralateral kidney early, i.e. renal calculi, pyelonephritis, etc. (11).

Therefore, as described above, XPN with IVC thrombus results in (re-phrase) diagnostic dilemma. Nephrectomy and histological confirmation are essential to cure the condition and to exclude an underlying malignancy.

Author declaration

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Conceptualisation and Design: JA, ABUI, WASDS; Writing – Original Draft: JA; Literature Review: JA; Image Preparation: JA; Writing – Review & Editing: JA, ABUI, WASDS

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Data, including the consent form, is available on request.

REFERENCES

1. Siddappa S, Ramprasad K, Muddegowda MK. Xanthogranulomatous pyelonephritis: a retrospective review of 16 cases. Korean journal of urology [Internet]. 2011 Jun;52(6):421–4. https://pubmed.ncbi.nlm.nih.gov/21750755/
2. Kuo CC, Wu CF, Huang CC, Lee YJ, Lin WC, Tsai CW, et al. Xanthogranulomatous pyelonephritis: critical analysis of 30 patients. International Urology and Nephrology. 2010 Jun 11;43(1):15–22. https://doi.org/10.1007/s11255-010-9778-8
3. Parsons MA, Harris SC, Longstaff AJ, Grainger RG. Xanthogranulomatous pyelonephritis: a pathological, clinical and aetiological analysis of 87 cases. Diagnostic Histopathology [Internet]. 1983;6(3-4):203–19. Available from: https://pubmed.ncbi.nlm.nih.gov/6676075/
4. Li L, Parwani AV. Xanthogranulomatous Pyelonephritis. Archives of Pathology & Laboratory Medicine. 2011 May 1;135(5):671–4. https://doi.org/10.5858/2009-0769-rsr.1
5. Watt I, Roylance J. Pyonephrosis. Clinical Radiology. 1976 Jan;27(4):513–9.
6. Jang TL, McKoy T, Hakim J, Polenakovik HM. Xanthogranulomatous pyelonephritis – A diagnostic and therapeutic dilemma. The American Journal of the Medical Sciences [Internet]. 2023 Mar 1;365(3):294–301. https://www.amjmedsci.com/article/S0002-9629(22)00465-7/fulltext
7. Stark K, Massberg S. Interplay between inflammation and thrombosis in cardiovascular pathology. Nature Reviews Cardiology. 2021 May 6;18(9). https://doi.org/10.1038/s41569-021-00552-1
8. Bourm KS, Menias CO, Ali K, Kinan Alhalabi, Elsayes KM. Spectrum of Xanthogranulomatous Processes in the Abdomen and Pelvis: A Pictorial Review of Infectious, Inflammatory, and Proliferative Responses. AJR Am J Roentgenol. 2017 Mar 1;208(3):475–84. https://doi.org/10.2214/ajr.16.17075
9. Lee SJ, Yang DM, Kim HC, Kim SW, Won KY, Park SH, et al. Imaging and Clinical Findings of Xanthogranulomatous Inflammatory Disease of Various Abdominal and Pelvic Organs: A Pictorial Essay. Journal of the Korean Society of Radiology [Internet]. 2024 Jan;85(1):109–23. Available from: https://pubmed.ncbi.nlm.nih.gov/38362380/
10. Mitchell DG, Friedman AC, Druy EM, Swanberg LE, Phillips M. Xanthogranulomatous perinephritis: unusual cause of renal vein and vena caval thrombosis. Urologic radiology [Internet]. 1985;7(1):35–8. https://pubmed.ncbi.nlm.nih.gov/3984116/
11. Jang TL, McKoy T, Hakim J, Polenakovik HM. Xanthogranulomatous pyelonephritis - A diagnostic and therapeutic dilemma. Am J Med Sci. 2023 Mar;365(3):294-301. https://doi.org/10.1016/j.amjms.2022.11.004