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## Widespread lytic lesions—A metastatic or vasculitic process?

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## ABSTRACT

**INTRODUCTION:** This case highlights the complexities in the initial diagnosis and investigations of widespread lytic lesions initially perceived to be a widespread metastatic process and the consideration of alternative diagnosis.

**PRESENTATION OF CASE:** A 57 year-old man with a background of psoriatic arthritis presented to the rheumatology department with lumbar back pain and sensory disturbance over L4/5. Magnetic resonance imaging (MRI) and bone scan identified lesions consistent with bony metastases at L5. The patient previously had a raised prostate specific antigen (PSA) of 10.8  $\mu\text{g/L}$  (normal < 4) but prostate biopsy was benign.

Multiple metastatic deposits in the liver and kidneys (confirmed necrotic tissue on biopsy) were identified through further investigations. The initial diagnosis of malignancy was challenged after a positron emission tomography (PET) scan showed lesions highly suggestive of polyarteritis nodosa (PAN) and subsequent magnetic resonance angiogram (MRA) revealed stenosis and aneurysm in the renal artery in keeping with PAN. Therefore what was initially thought to be a widespread metastatic disease process was in fact the manifestation of a systemic vasculitic disease.

**DISCUSSION:** PAN is a vasculitis that predominantly involves small to medium-sized vessels. The disease can affect any site in the body, but holds a predisposition for organs such as kidneys, heart and the gastrointestinal tract. Differential diagnosis of PAN should be considered in patients with widespread lytic lesions.

**CONCLUSION:** Due to the pathological nature of PAN and its variable clinical manifestations that add to the challenges of its diagnosis, one must hold a high clinical suspicion, even in urological conditions.

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## 1. Introduction

This case highlights the complexities in the initial diagnosis and investigations of widespread lytic lesions initially perceived to be a widespread metastatic process and the consideration of alternative diagnosis. Furthermore identification is made of the rare overlap of differential diagnosis of disease processes between urology and rheumatology and the robust multi-disciplinary and cross specialty support required for this resolution.

## 2. Presentation of case

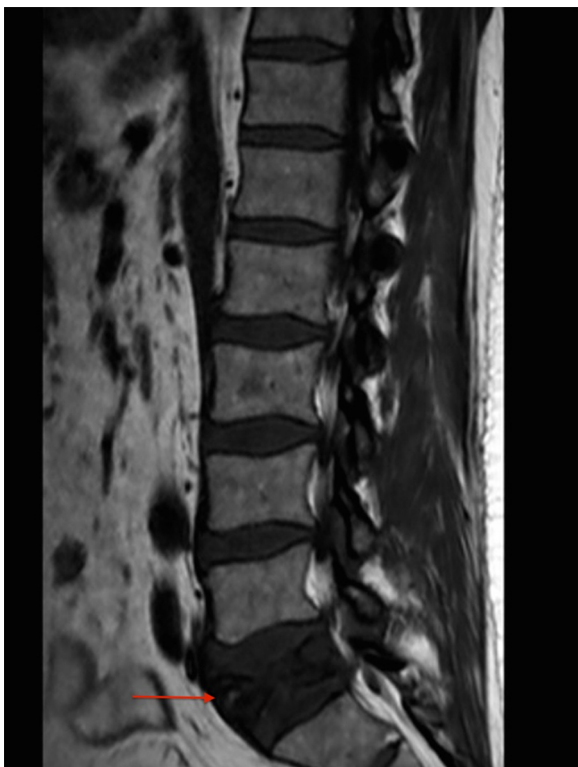
A 57 year-old man with a background of psoriatic arthritis (treated with disease modifying agents) presented to the rheumatology department with lumbar back pain and sensory disturbance over L4/5. The patient's only relevant medical history revealed

urological surveillance of PSA, which rose from 4.0  $\mu\text{g/L}$  (2008) to 10.8  $\mu\text{g/L}$  (2012). Initial transrectal and further transperineal template-guided prostate biopsies were benign. On further history taking it was noted that the patient had sustained a weight loss of two stones with night sweats, and had symptoms of polyneuropathy and calf claudication.

Examination revealed localised lumbar-sacral tenderness, with no focal neurological deficit. The duration and nature of the symptoms led to an MRI which identified destructive lesions at L5 vertebra and a subsequent bone scan revealed increased uptake in the L5 vertebra and left hip highly suggestive of a metastatic process from a primary tumor of an unknown origin (Fig. 1). In view of a benign prostatic biopsy an attempt was made to further investigate the primary source.

CT scan of the chest/abdomen/pelvis revealed multiple metastatic deposits in the liver (Fig. 2), both kidneys (Fig. 3), Iliac bones and left sacroiliac joint. At this stage concern was expressed if the primary malignancy originated from the hepatic or renal system. After extensive multidisciplinary team discussion (MDT), histological examination was obtained from ultrasound guided biopsies of the liver and renal lesion, which identified necrotic

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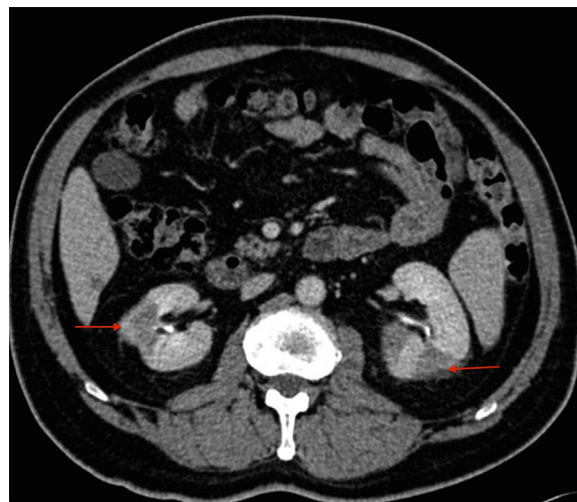
**Fig. 1.** Sagittal MRI view demonstrating collapse of L5 vertebral body suggestive of metastatic disease.



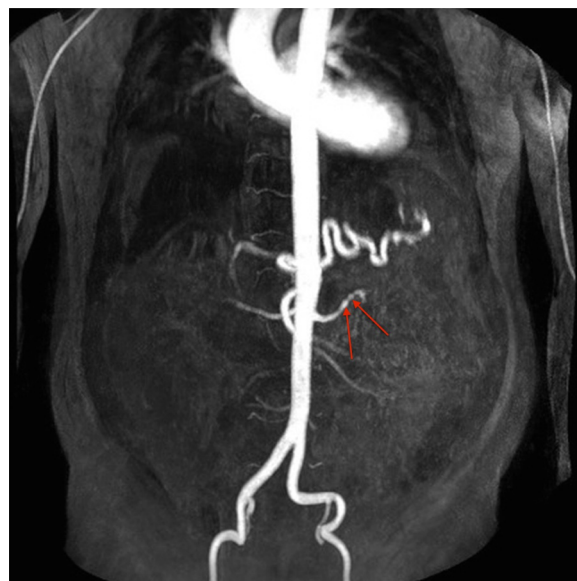
**Fig. 2.** Axial CT image demonstrating liver lesions initially suggestive of metastatic disease.

tissue only. A PET scan was performed to refine the differential diagnostic list. The report suggested fluorodeoxyglucose (FDG) negative lesions in the liver, kidney and bone, characteristic of infarcts rather than metastatic deposits, all of which were strongly suggestive of PAN. An MRA was performed which identified a stenosis and aneurysm of the left renal artery with areas of post-inflammatory changes—supporting the diagnosis of PAN (Fig. 4).

Rheumatoid factor and Cytoplasmic antineutrophil cytoplasmic antibody (cANCA) were positive but antinuclear antibodies (ANA) and antibodies against myeloperoxidase (MPO), serine proteinase (PR3) or hepatitis B virus were negative. Complete blood count (CBC), urea, creatinine, electrolytes (Na & K), complements C3 and C4 as well as uric acid were normal. Erythrocyte sedimentation rate measured 36 and C-reactive protein (CRP) was 61 mg/L



**Fig. 3.** Axial CT image of renal lesions initially suggestive of metastatic disease.



**Fig. 4.** MR angiogram image demonstrating luminal irregularity and alternating focal dilatation of the left distal renal artery and narrowing in keeping with stenosis and mild aneurysm suggestive of vasculitis.

(normal <4). In addition, Beta 2 microglobulin was slightly elevated at 2.68 mg/L (normal limit 2.40) and urine protein creatinine ratio (PCR) was 9.

Initial differential diagnosis encompassed metastatic lesions from multiple primary sources including prostate cancer, renal cell carcinoma and hepatocellular carcinoma. Later on PAN became evident as a serious contender for the primary diagnosis.

Given systemic history of malaise, weight loss, night sweats, large joint arthritis, MRA findings and FDG PET showing features of renal, hepatic and bony infarcts, a diagnosis of PAN was made and the patient was commenced on immunosuppressive regimen aimed at inducing remission. Patient was started on high dose oral steroids (Prednisolone 60 mg) and methotrexate 25 mg/week.

At presentation the patient had a Birmingham Vasculitis Activity Score (BVAS) of ten and on one month follow up the patient reported significant improvement in clinical symptoms particularly back pain and lower limb paraesthesia and attained a BVAS of zero with normal inflammatory markers. He had no further weight loss and reported weight gain reaching pre-morbid levels. A repeat MRI

of the abdomen showed a reduction in the size of the hepatic and renal lesions further excluding a malignant process. He is under regular follow up with the rheumatology department where he has successfully undergone steroid taper regimen and is currently on a modest dose of steroids and oral methotrexate. He is undertaking active physiotherapy including hydrotherapy to improve the lumbosacral discomfort and is contemplating return to work.

### 3. Discussion

PAN is a vasculitis that predominantly involves small to medium-sized vessels. The disease can affect any site in the body, but holds a predisposition for organs such as kidneys (93%), heart (72%), the gastrointestinal tract (57%), with several reports highlighting involvement of the testes and prostate [1,2]. Signs and symptoms result from the ischemic changes to the affected organ, therefore its presentation can be very variable and adds to the challenges of its diagnosis. The exact etiology is unknown and vast majority of the cases are idiopathic in origin while a small number are secondary to infections like Hepatitis B and systemic diseases like systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), Sjogrens etc. It is difficult to attribute a clear link immunologically between Psoriasis/Psoriatic arthritis and PAN, but there are some reports, which have shown isolated association between PAN and psoriatic arthritis and spondyloarthritis [3,4].

As demonstrated in this case, diagnosis can be challenging and was historically dependent upon histology (according to the Chapel Hill Consensus criteria [5]) and an angiogram demonstrating a renal artery aneurysm. There are no diagnostic laboratory tests for PAN and the current ACR (American college of Rheumatology) classification criteria provides a sensitivity and specificity of 82 and 87% respectively for the diagnosis of PAN provided 3 of the 10 criteria are satisfied. PAN commonly affects middle aged or older adults with incidence rising with age reaching a peak at 6th decade [6]. There is 1.5:1 male predominance. The 5-year survival following treatment with immunosuppression ranges between 75 and 80% [7].

Vast amount of literature is available on PAN. Ambrosio et al. highlight a case report that demonstrates an atypical manifestation of PAN presenting as a renal mass in a patient with angioimmunoblastic T-cell lymphoma (AITL) (sub-type of peripheral T cell lymphoma) [8]. However, the complexities of this case were different from our case as it postulated a relationship of an autoimmune process by the lymphoma leading to vessel wall injury and thus PAN. In our case we do not demonstrate causality but rather the wide scope of differentials postulated by PAN's pathological manifestation.

Bing et al. reported a case of PAN presenting clinically in a 46 year old fit male with loin pain and frank haematuria following an episode of strenuous exercise [9]. Initial concerns of renal trauma were subsided by investigations revealing an intra-renal aneurysm, confirming PAN as a diagnosis and its resolution following a course of immunosuppressive therapy.

### 4. Conclusion

The purpose of our case report was to demonstrate the consideration of PAN as a serious contender in the differential diagnosis of widespread lytic lesions, when no other primary source can be

identified. Because of the pathological nature of PAN and its variable clinical manifestations adding to the challenges of its diagnosis, one must hold a high clinical suspicion of its diagnosis even in urological conditions.

### Conflicts of interest

No conflicts of interest.

### Funding

None.

### Ethical approval

None.

### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

### Author contribution

Fahd Khan: Writing the paper.  
Srinivasan Srirangan: Reviewed draft.  
Yasser El-Miedany: Reviewed draft.  
Sanjeev Madaan: Study concept.

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