Misdiagnosis of Renal Pseudoaneurysm Following Left Partial Nephrectomy

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Introduction

Pseudoaneurysms are injuries to the arterial vasculature in which blood collects between the media and adventitia layer of the arterial wall. Pseudoaneurysms are often asymptomatic and discovered as incidental findings on surveillance or diagnostic imaging. Undetected, and consequently untreated, pseudoaneurysms are at risk for rupture and may cause significant morbidity and mortality due to massive hemorrhage[1].

Case Presentation

We present a 57-year-old female with a past medical history of a left partial nephrectomy for the removal of a renal cell carcinoma (RCC) from the upper pole of the left kidney (Figure 1). Three months status post partial nephrectomy, a new left interpolar lesion was identified by a follow-up computed tomography (CT) scan. The scan was initially interpreted as recurrent RCC. (Figure 2).

The patient was referred to the department of interventional radiology for a left renal biopsy to confirm the recurrence of RCC with plans to subsequently proceed with a radical left nephrectomy. Further review of the follow-up CT determined that the lesion followed arterial blood contrast enhancement, indicating an arterial vascular injury rather than RCC recurrence (Figure 3). The patient was then evaluated by renal ultrasound which confirmed the presence of a left renal pseudoaneurysm using both grayscale and color Doppler images (Figure 4). The previously scheduled renal biopsy and radical left nephrectomy were cancelled.

The patient was referred to the department of interventional radiology for treatment of the pseudoaneurysm and underwent selective coil embolization of the left renal pseudoaneurysm. Post-embolization left renal angiogram demonstrated complete cessation of bloodflow to the left renal pseudoaneurysm (Figure 5). There were no reported signs of post-embolization complication or recurrent RCC at follow-up.

Imaging

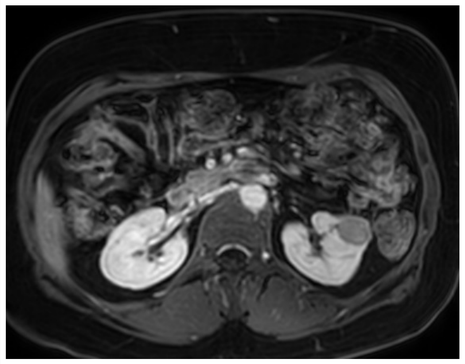

Figure 1: A 57-year-old female status pre partial left nephrectomy with a renal cell carcinoma in the upper pole of the left kidney. Axial T2- weighted magnetic resonance imaging (MRI) shows an iso-/hypointense, circumscribed, solid mass in the upper pole of the left kidney. The mass measures 2.3 x 1.7 x 2.2 cm.

Figure 2: Three months status post partial left nephrectomy. Axial contrast enhanced CT demonstrates excision of previously identified renal cell carcinoma from the left upper pole. A new interpolar lesion measuring 1.8 x 1.6 x 2.0 cm can be seen.

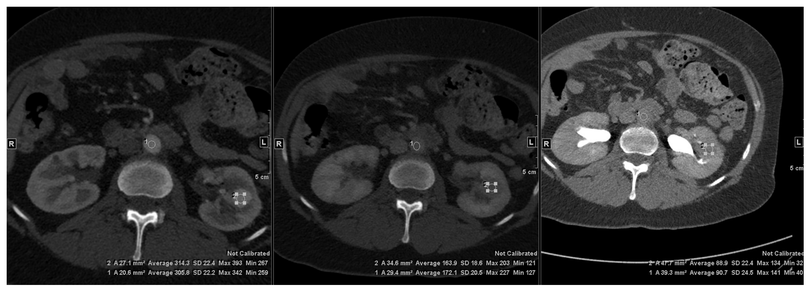

Figure 3: Contrast enhanced CT demonstrating similar Hounsfield units (HU) between the aorta and left renal interpolar lesion indicating similar radiodensity between the two structures.
Left: Aorta (1) = 305.8 HU. Left interpolar renal lesion (2) = 314.3 HU.
Middle: Aorta (1) = 172.1 HU. Left interpolar renal lesion (2) = 163.9 HU.
Right: (1) = 90.7 HU. Left interpolar renal lesion (2) = 88.9 HU.

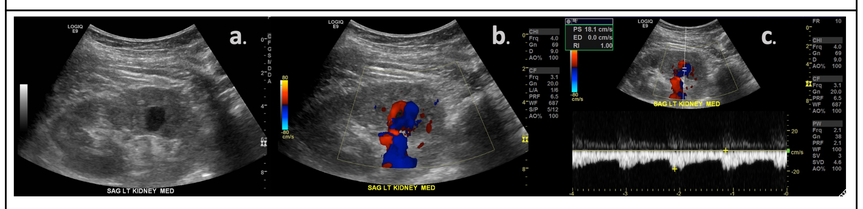

Figure 4: A) Left renal ultrasound reveals a 1.6 x 1.6 cm anechoic structure. B,C) Colored doppler imaging demonstrates internal to-and-fro flow indicating the presence of a pseudoaneurysm.

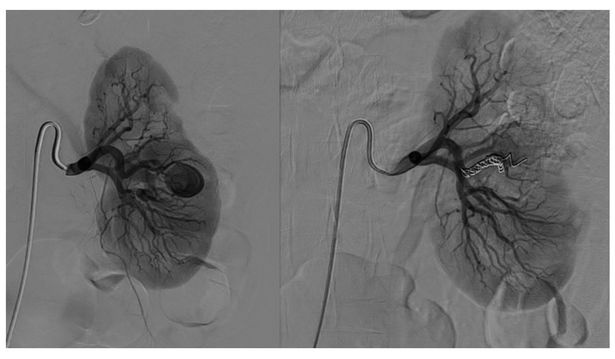

Figure 5: Left renal digital subtraction arteriogram (DSA) confirms the presence of an interpolar pseudoaneurysm of the left renal artery (left). Post-embolization left renal DSA demonstrated complete cessation of bloodflow to the pseudoaneurysm (right).

Discussion

Known risk factors for pseudoaneurysm formation include inflammation, trauma, and iatrogenic causes such as percutaneous biopsy or surgery[1]. Pseudoaneurysms can be identified using multiple imaging modalities including ultrasound, computed tomography, magnetic resonance imaging, and angiography. Pseudoaneurysms can be identified as anechoic vascular sacs on grayscale ultrasound with a “yin-yang” sign indicating to-and-fro flow on color Doppler[2]. Pseudoaneurysms appear similar on contrast enhanced CT and MRI, with the vascular lesion following similar attenuation patterns to other arterial structures throughout the study[3]. Pseudoaneurysms identified on MRI may demonstrate motion artifact within the lumen[3].

The ability to accurately diagnose pseudoaneurysms in all imaging modalities is imperative for improving patient outcomes by allowing timely treatment intervention to decrease the morbidity and mortality associated with pseudoaneurysm rupture. In the presented case, a left renal pseudoaneurysm was misdiagnosed as recurrent renal cell carcinoma; a diagnosis initially planned to be confirmed by renal biopsy. Biopsy of this lesion would have led to significant bleeding.

Conclusion

To reduce the risk of morbidity and mortality associated with pseudoaneurysm rupture, pseudoaneurysms must be accurately identified to allow for proper treatment.

Understanding the risk factors for pseudoaneurysm formation and the characteristic findings for pseudoaneurysms in multiple imaging modalities is imperative for improving patient outcomes. We present this case to emphasize the importance of timely and accurate pseudoaneurysm identification.

References

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