



Oncology

Hidden Renal Artery Pseudoaneurysm: The Need for Repeat Angiographic Intervention in a Symptomatic Patient



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ABSTRACT

Renal artery pseudoaneurysm (RAP) is a well-known and life-threatening complication of partial nephrectomies. Angioembolization is the preferred intervention, allowing for visualization, diagnosis, and treatment in 96% of cases. We report a case of a pseudoaneurysm that was difficult to diagnose even with optimal technique, requiring repeat imaging and additional angiographic intervention. Our case shows that RAP after partial nephrectomies may be difficult to diagnose even with high suspicion and appropriate technique. Repeat angiography may be required. Urologists and interventional radiologists together must keep RAP high on the differential even after a negative angiogram to adequately diagnose and treat symptomatic patients.

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Introduction

Renal artery pseudoaneurysm (RAP) is a well-known and life-threatening complication of open and laparoscopic partial nephrectomies.^{1,2} The reported incidence ranges between 1.00–2.7%,^{2,3} occurring more frequently in laparoscopic compared to open partial nephrectomies.^{2,4} The three most common presentations of RAP are gross hematuria, flank pain, and anemia,² with most patients presenting usually around two weeks postop.² Untreated, RAPs can lead to severe hematuria, blood loss, hemorrhagic shock, and even death.^{3,4}

The diagnosis of RAP requires a high index of suspicion because many patients present with non-specific complaints, often many days after the postoperative period.¹ Radiographic evaluation using CT scan of the abdomen usually demonstrates a focal enhancing lesion.³ Angiography allows for quick visualization, diagnosis, and treatment of the pseudoaneurysm.^{3,4} Coil embolization can successfully treat up to 96% of cases.² We report a case of a pseudoaneurysm that was difficult to diagnose despite optimal technique, requiring repeat imaging and angiographic intervention.

Case presentation

A 48-year-old Caucasian male with a history of Charcot-Marie-Tooth was found to have bilateral renal masses incidentally on CT imaging. An open left partial nephrectomy was performed initially without complication. Nine months later, the right renal mass was resected via robotic partial nephrectomy. Pathology report showed Stage 1 papillary RCC. He was discharged home post operative day #4 without any complications. On post operative day 15, the patient called the Urology office complaining of right flank pain and hematuria. He presented to the local emergency department, where an emergency CT scan was negative for pseudoaneurysm, AV fistula or malformation, or perinephric hematoma. His hemoglobin was stable at 12.8. His condition improved and he was sent home. The next day he came to our hospital with continued hematuria and flank pain and was admitted overnight for observation. CT scan was repeated, which showed a blood clot in the bladder.

Interventional radiology service was consulted to perform renal angiography with possible embolization. Angiography showed no AV malformation or pseudoaneurysm, and the defects observed were compatible with partial nephrectomy (Fig. 1a). No bleeding was seen, and thus no embolization was performed. At that point, there was a clinical concern for high-grade ureteral obstruction or renal vein thrombosis. US showed no abnormality or renal vein thrombosis. The patient was then taken to the OR for cystoscopy, retrograde pyelogram, and right ureteral stent placement. The

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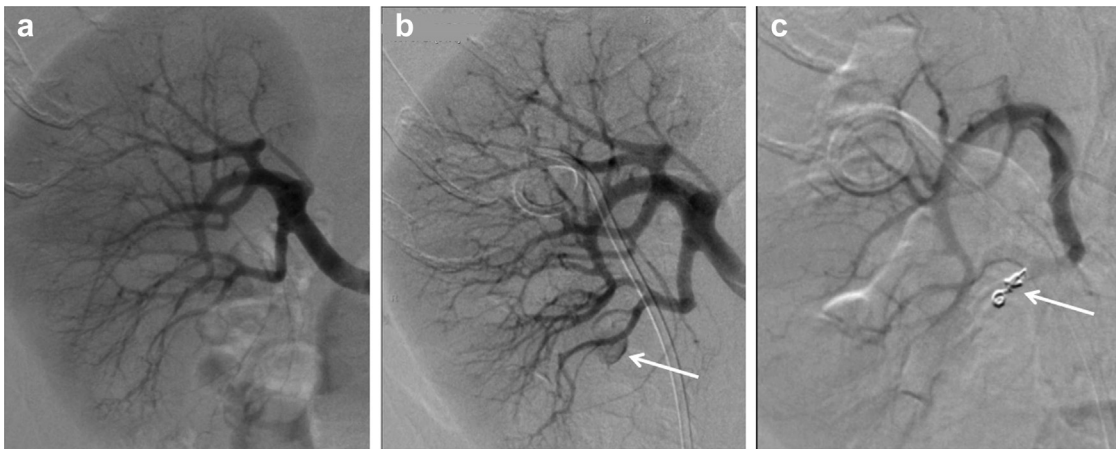


Figure 1. Selective angiography of the right kidney was performed in the following three images. (a) Initial angiogram performed, showing no visible pseudoaneurysm. (b) Second angiogram performed, this time illustrating the pseudoaneurysm (arrow). (c) Angiogram after coiling (arrow).

patient was discharged home two days later with clear urine, minimal pain, and Foley catheter in place.

Five days later, the patient called complaining of pink urine and urinary retention. CT and US showed stent in place and no evidence of renal vein thrombosis. He was then taken to the angiography suite. This time, angiography, using the same injection rates and projections, demonstrated a pseudoaneurysm off a small arterial branch going to the lower pole of the right kidney (Fig. 1b), which was successfully embolized using a 4/2 Tornado Coil (Fig. 1c). The patient made an uneventful recovery and was symptom-free when reviewed one month later.

Discussion

RAP occurring after partial nephrectomies can be difficult to diagnose even in the setting of proper evaluation and optimal technique. Our case shows that a negative angiogram does not completely exclude the possibility of a pseudoaneurysm in a patient after partial nephrectomy. While other conditions such as renal vein thrombosis or ureteral obstruction may be considered, RAP should remain high in the differential diagnosis. In our patient, the likely presence of hematoma or thrombus compressing the pseudoaneurysm on the initial angiogram may explain both the cyclical nature of the hematuria and flank pain and our inability to visualize the pseudoaneurysm on the initial study. After several days, the hematoma may have resorbed, which then allowed for full visualization of the pseudoaneurysm upon repeat angiogram. This case highlights the potential need for repeat angiography to ensure

the proper diagnosis of pseudoaneurysm in patients who continue to be symptomatic.

Conclusion

Renal artery pseudoaneurysms after partial nephrectomies may be difficult to diagnose even with high suspicion and appropriate technique. Repeat angiography ultimately may be required for proper diagnosis and treatment. Urologists and interventional radiologists together must keep RAP high on the differential even after a negative angiogram in order to adequately diagnose and treat symptomatic patients.

Conflicts of interest

The authors report no conflicts of interest or financial disclosures.

References

1. Albani JM, Novick AC. Renal artery pseudoaneurysm after partial nephrectomy: Three case reports and a literature review. *Urology*. 2003 Aug;62(2):227–231.
2. Jain S, Nyirenda T, Yates J, Munver R. Incidence of renal artery pseudoaneurysm following open and minimally invasive partial nephrectomy: A systematic review and comparative analysis. *J Urol*. 2013 May;189(5):1643–1648.
3. Strobl FF, D'Anastasi M, Hinzpeter R, et al. Renal pseudoaneurysms and arteriovenous fistulas as a complication of nephron-sparing partial nephrectomy: Technical and functional outcomes of patients treated with selective microcoil embolization during a ten-year period. *Rofo*. 2016 Feb;188(2):188–194.
4. Irwine C, Kay D, Kirsch D, Milburn JM. Renal artery embolization for the treatment of renal artery pseudoaneurysm following partial nephrectomy. *Ochsner J*. 2013 Summer;13(2):259–263.