



## Case Report

## Asymptomatic renal pseudoaneurysm after percutaneous renal biopsy

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## ABSTRACT

A 37-year-old man was referred to Division of Nephrology for a new renal cystic lesion that was found on ultrasonography. Four years prior to presentation, a percutaneous renal biopsy had been performed. Computed tomography scan showed a 4.4-cm-sized renal artery pseudoaneurysm in the left kidney. Selective renal angiography revealed a pseudoaneurysm in the left lower pole of the kidney. The renal pseudoaneurysm was successfully embolized with coil. Follow-up Doppler ultrasonography showed no internal blood flow into the aneurysmal sac. His renal function remained stable after coil embolization.

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## Introduction

Renal pseudoaneurysms occur after renal trauma, surgery or percutaneous procedures and can also be secondary to inflammatory or neoplastic conditions in the kidney [1,2]. Even though renal pseudoaneurysm is a known complication of renal biopsy, it is rare in individuals without a history of trauma, kidney transplantation, or nephrectomy.

Early detection and treatment of renal artery pseudoaneurysm are important because the lesion is easily ruptured and can lead to life-threatening hemorrhage [1,2]. However, the clinical features of renal pseudoaneurysm are unreliable and do not reflect severity [1]. Patients may complain of flank pain or gross hematuria and may even present with anemia or shock [1,3]. Selective angioembolization is the treatment of choice, but some patients with uncontrolled bleeding may

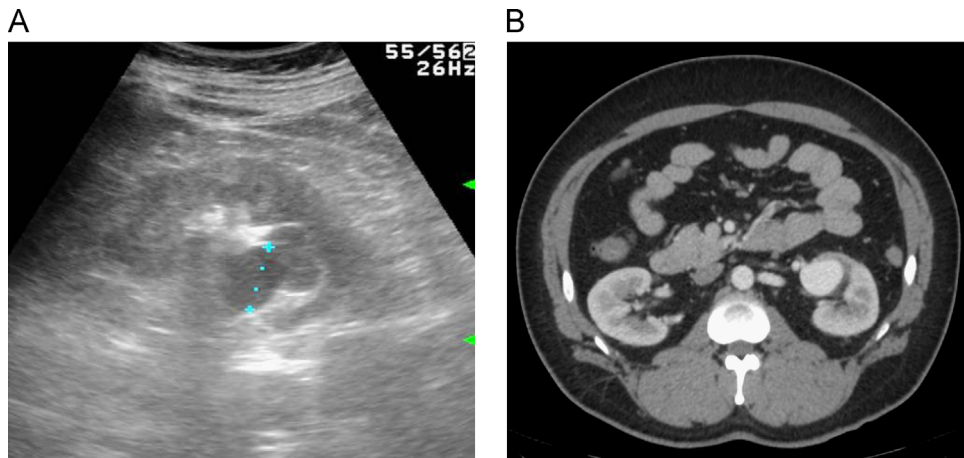
require partial or total nephrectomy [1]. Here, we report a rare case of asymptomatic renal pseudoaneurysm, found 4 years after percutaneous renal biopsy, in which selective angiographic embolization was successful.

## Case report

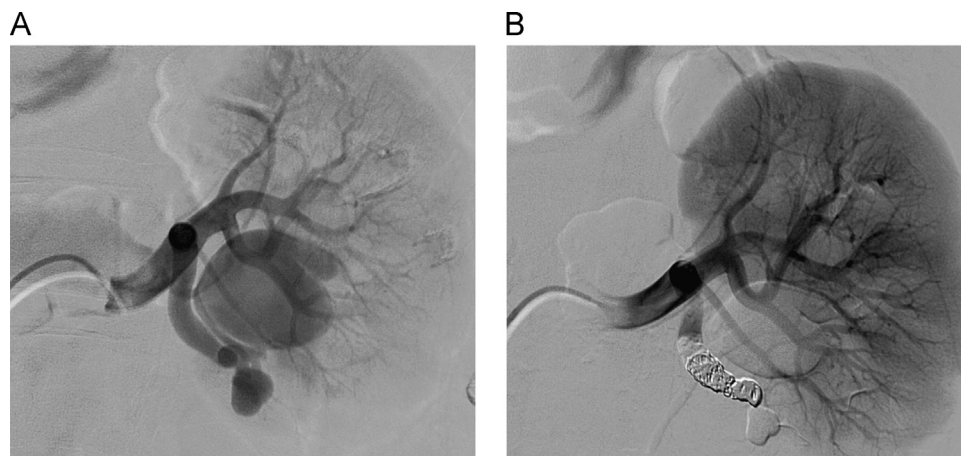
A 37-year-old man was referred to the Division of Nephrology for a renal cyst incidentally found on ultrasonography (Fig. 1A). An ultrasound-guided percutaneous renal biopsy was performed 4 years prior to presentation owing to microscopic hematuria and proteinuria. The pathologic finding of renal biopsy showed membranoproliferative glomerulonephritis. The patient did not complain of flank pain or gross hematuria. There were no bruits or palpable masses. He had been on antihypertensive medications (olmesartan 40 mg, amlodipine 10 mg, ramipril 10 mg) since he was diagnosed with hypertension 4 years prior to presentation. He had not taken antiplatelet agents or anticoagulants. He had no other history of trauma or surgery. On admission, his blood pressure was 130/80 mmHg and his pulse was 88 beats/minute. Blood urea

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**Figure 1. Pseudoaneurysm in the left kidney.** (A) Ultrasonography reveals a 3-cm renal cystic lesion in the left kidney. (B) CT scan shows 4.4-cm renal artery pseudoaneurysm in the left kidney.



**Figure 2. Renal angiography.** (A) Selective renal angiography demonstrates a renal pseudoaneurysm supplied by one of the main branches of the left renal artery in the lower pole. (B) The renal pseudoaneurysm is selectively embolized with coils.

nitrogen was 13.4 mg/dL and serum creatinine was 0.85 mg/dL. The estimated glomerular filtration rate was 100.1 ml/min/1.73 m<sup>2</sup> by the four-variable Modification of Diet in Renal Disease Study equation. Hemoglobin was 16.3 g/dL, hematocrit was 48.1%, and platelets were 196,000/ $\mu$ L. Prothrombin time was 12.0 seconds and activated partial thromboplastin time was 38.2 seconds. On urine analysis, proteinuria and hematuria were not present (blood-, protein-, 0–2 RBCs/HPF). Abdominal computed tomography scan revealed a 4.4-cm-sized renal artery pseudoaneurysm (Fig. 1B). The location of the renal pseudoaneurysm was consistent with the previous biopsy site. On renal angiography, aneurysmal change was observed in one of the main branches of the left renal artery, and coil embolization was successfully applied (Fig. 2). Renal function after angioembolization remained stable. Two days after the procedure, follow-up Doppler ultrasonography showed no blood flow into the aneurysmal sac.

## Discussion

We presented a rare case of delayed recognition of renal pseudoaneurysm 4 years after renal biopsy.

Renal pseudoaneurysm can occur after trauma, percutaneous or endoscopic urologic procedures, and surgery and in

the presence of vasculitis and neoplasm [1,2]. This patient had no other history of trauma, surgery, neoplasm, or autoimmune disease. Therefore, we concluded that the pseudoaneurysm was derived from the previous renal biopsy because the ultrasound-guided percutaneous renal biopsy, which had been targeted to the low pole of the left kidney, was performing 4 years prior to presentation.

The incidence of renal pseudoaneurysm has been reported to be approximately 5% from a series of 72 consecutive percutaneous allograft biopsies studied with duplex ultrasonography; but in this study, most of the pseudoaneurysms did not become clinically important and were resolved without intervention [4]. One recent report showed the incidence of major complications of percutaneous kidney biopsy, which required blood transfusion or surgical or angiographic interventions, was 0.9% [5]. Preda et al showed the incidence of major complications requiring postprocedural interventions, including transfusion in 515 percutaneous kidney biopsies performed on native and allograft kidneys, was approximately 3% for both groups (2.4% in native kidney vs. 2.9% in renal allograft) [6].

The clinical manifestations of renal pseudoaneurysm vary from asymptomatic to nonspecific flank pain, hematuria, hypertension, and anemia [1,3,7–9]. Diagnosis is based on clinical suspicion and is critical to avoid the risk of rupture [1–3,10]. Although no consensus exists for the size at which a kidney pseudoaneurysm

should be treated in the asymptomatic patient, the risk of rupture increases with the size of the pseudoaneurysm [1,10]. Selective angioembolization is first-line therapy for renal pseudoaneurysms. The procedure is safe and effective and minimizes the territory of infarction [1,2,10,11]. In this case, renal pseudoaneurysm was incidentally recognized as a renal cystic lesion on ultrasonography without any specific symptoms. The size was deemed large enough that rupture was probable. We selected the artery feeding the pseudoaneurysm and embolized it. After coil embolization, the renal function was well-preserved.

Reports of patients developing pseudoaneurysms after percutaneous renal biopsy without any kidney-related surgery or trauma are very rare. Most of the previously reported cases occurred in renal transplant recipients after renal allograft biopsy or in those with a surgical history such as partial nephrectomy [7,9–12]. Regarding the low complication rate of renal biopsy, a routine follow-up ultrasonography in every patient may not be necessary. However, when clinical symptoms occur, further imaging studies should be performed without any delay [6]. Furthermore, it is important to consider that Doppler ultrasonography is needed when a cystic lesion is found on ultrasonography, if a patient has a history of renal biopsy to detect vascular complications such as arteriovenous fistula or renal pseudoaneurysms.

### Conflicts of interest

None to declare.

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