Radiology Case Reports 17 (2022) 4413–4416

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journal homepage: www.elsevier.com/locate/radcr

Case Report

Development of ileocolic artery pseudoaneurysm after renal biopsy☆

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ARTICLE INFO

Article history:
Received 6 August 2022
Revised 17 August 2022
Accepted 21 August 2022
Available online 19 September 2022

Keywords:
Microcoils
Pseudoaneurysm
Fistula
Renal biopsy
Extrarenal artery
Ileocolic artery

ABSTRACT

The rate of bleeding complications related to percutaneous native renal biopsy is low, and pseudoaneurysms of the extrarenal arteries are rare. There have been a few reports of extrarenal artery injuries related to renal biopsy; however, to the best of our knowledge, there have not been any reports of injuries to the ileocolic artery or multiple injuries to extrarenal arteries. Herein, we report the case of an 87-year-old man who developed multiple vascular injuries: an arteriovenous fistula at the lower pole of the right kidney, pseudoaneurysms of the second lumbar artery, and an ileocolic artery 19 days after renal biopsy. Although identifying an ileocolic artery pseudoaneurysm was slightly delayed due to its rarity, all vascular injuries were successfully embolized with microcoils.

Introduction

Native renal biopsies are common and important for diagnosing kidney disease. With the development of automated biopsy devices and the assistance of ultrasonography, it has become possible to perform this procedure safely. Bleeding complications requiring intervention related to percutaneous native renal biopsy are rare [1]. Vascular injuries are typically renal pseudoaneurysms or arteriovenous fistulas (AVFs), and pseudoaneurysms of extrarenal arteries are extremely rare [2]. A few cases have been reported: abdominal aorta, lumbar artery, jejunal artery, and left colic artery [2–7]. To the best of our knowledge, cases of ileocolic artery pseudoaneurysms and multiple injuries to extrarenal arteries, related to renal biopsy have never been reported. We report a case of multiple vascular injuries after a renal biopsy that was successfully embolized with microcoils.

☆ Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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https://doi.org/10.1016/j.radcr.2022.08.079

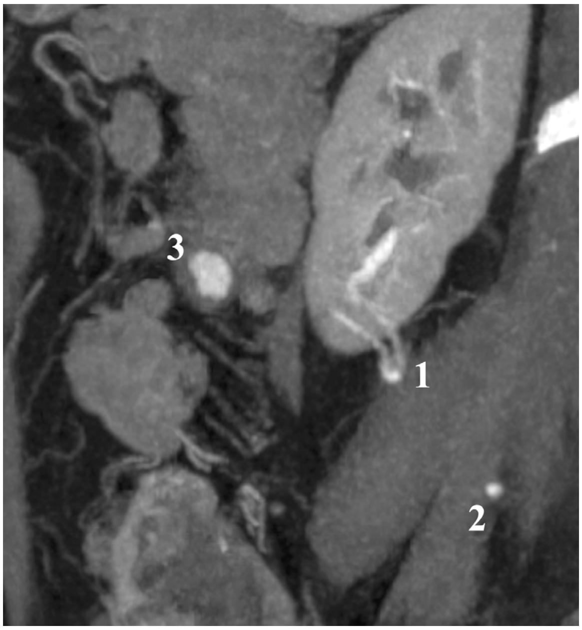

Fig. 1 – The contrast-enhanced computed tomography (CECT) oblique maximum intensity projection (MIP) reconstructed sagittal image. The 3 sources (1, 2, and 3) of bleeding are identified in the same cross section.

Case report

An 87-year-old man with diabetes, hypertension, and dyslipidemia was admitted to our hospital with an acute kidney injury. On day 6 of admission, an ultrasound-guided renal biopsy was performed. Five tissue samples were obtained with 5 punctures using a 16-G core biopsy needle. The patient was diagnosed with anti-glomerular basement membrane nephritis. Although plasmapheresis and corticosteroid therapy was initiated, the patient's renal function did not improve. In addition, his renal prognosis was poor, and an AVF was created in his left forearm for hemodialysis access. On day 25 of admission, although he had no abdominal pain or melena, regular blood tests showed worsening anemia, with a hemoglobin level of 6.1 g/dL. Arterial and venous phase images with contrast-enhanced computed tomography (CECT) revealed an AVF at the lower pole of the right kidney. Furthermore, we detected a pseudoaneurysm in the dorsal soft tissue, surrounded by muscles at the third lumbar level (Fig. 1). Emergent embolization of both lesions was performed on the same day. Digital subtraction angiography revealed an AVF at the lower pole of the right kidney (Fig. 2A) and a second lumbar artery pseudoaneurysm (Fig. 3). The inflow artery of the AVF was selected using a 1.9 Fr microcatheter (Progreat lambda19 (Terumo, Tokyo, Japan)) and embolized with microcoils (Target XL 2 mm × 30 mm (Striker, Kalamazoo, MI), Target XL 3 mm × 60 mm, 3 C-stopper coil 0.016-inch × 30 mm (Piolax Medical Device, Kanagawa, Japan), C-stopper coil 0.016-inch × 60 mm) (Fig. 2B). It was difficult to reach the distal neck of the pseudoaneurysm. A microcoil (Tornado 3-2 mm × 20 mm (Cook Medical, Bloomington, IN)) was placed from the inside of the pseudoaneurysm to the proximal side, and additional embolization was performed using gelatin sponge particles (Serescue (Astellas Pharma, Tokyo, Japan)). The anemia worsened again 2 days after embolization, and CECT was repeated. The previously embolized lesions showed no signs of recanalization. However, we detected a pseudoaneurysm in the wall of the ascending colon. Retrospectively, we evaluated the previous CECT again and noticed that the same lesion was present (Fig. 1). The CECT oblique maximum intensity projection reconstructed images revealed that 3 sources of bleeding located in the same cross section (Fig. 1). Repeat angiography showed a pseudoaneurysm arising from a branch of the ileocolic artery (Figs. 4A,B). With a 2.0 Fr microcatheter (Excelsior 1018 (Striker, Kalamazoo, MI)), it was difficult to select the

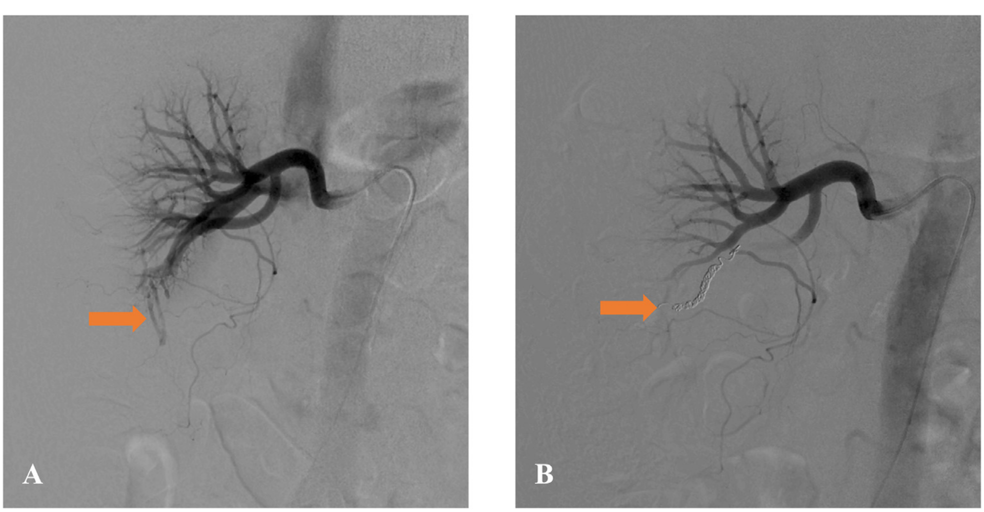

Fig. 2 – (A) Right renal artery digital subtraction angiography (DSA) shows an arteriovenous fistula (AVF) at the lower pole of the right kidney (arrow). The inflow artery is selected and embolized with microcoils. (B) DSA after placing the microcoils confirms the disappearance of the AVF (arrow).

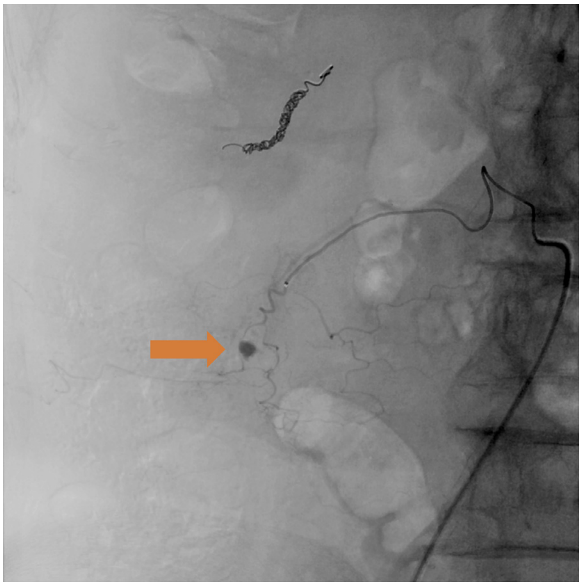

Fig. 3 – Selective DSA of the right second lumbar artery with the microcatheter shows a pseudoaneurysm (arrow). It is difficult to reach the distal neck of the pseudoaneurysm. A microcoil is placed from the inside of the pseudoaneurysm to the proximal side, and additional embolization is performed using gelatin sponge particles.

branch leading to the neck of the pseudoaneurysm. The segment including the branch was embolized using microcoils (2 SMART coil 1.5 mm × 4 mm (Penumbra, Alameda, CA), C-stopper coil 0.014 inch × 30 mm). Post-embolization digital subtraction angiography confirmed that the pseudoaneurysm had disappeared (Fig. 4C). An improvement was noted in the patient's anemia and he was subsequently discharged on day 75 of admission.

Discussion

Percutaneous renal biopsy is essential for the diagnosis of glomerular, vascular, and tubulointerstitial kidney disease [1,8]. Real-time ultrasonography and automated biopsy devices have been used since the 1980s, which have reduced complications [9]. The rates of bleeding complications after a native renal biopsy have been reported in a meta-analysis: hematomas occurred in 11% of cases, interventions to stop bleeding were required in 0.3% of cases, and deaths were estimated in 0.06% of cases. Complications occur more frequently in hospitalized patients and those with acute kidney injury [1].

Anti-glomerular basement membrane disease is an autoimmune disease that presents with crescentic glomerulonephritis and is often accompanied by pulmonary hemorrhage which may be life-threatening [10]. Standard treatment includes plasmapheresis, corticosteroids, and cyclophosphamide [11]. Since this patient had no coagulopathy, albumin was used as a replacement fluid for plasmapheresis, which may have led to coagulation factor deficiency. In addition, the use of anticoagulants for plasmapheresis, the patient's age, and the corticosteroids might have contributed to the multiple pseudoaneurysms.

In most cases of vascular injury related to renal biopsy, the pathology is renal arterial pseudoaneurysm or AVF. It is unknown what the exact incidence of pseudoaneurysms of the extrarenal arteries is, but it is considered extremely rare [2]. A few cases have been reported in the literature involving the abdominal aorta, lumbar artery, jejunal artery, and left colic artery [2–7]. As far as we know, 3 cases of mesenteric artery injury after renal biopsy have been reported until now.

In 1980, Galloway [6] reported a case of a 26-year-old woman with a jejunal artery injury. Three hours after the biopsy, she became hypotensive and presented with abdominal and flank pain and anemia. Superior mesenteric artery angiography revealed active bleeding from the jejunal artery

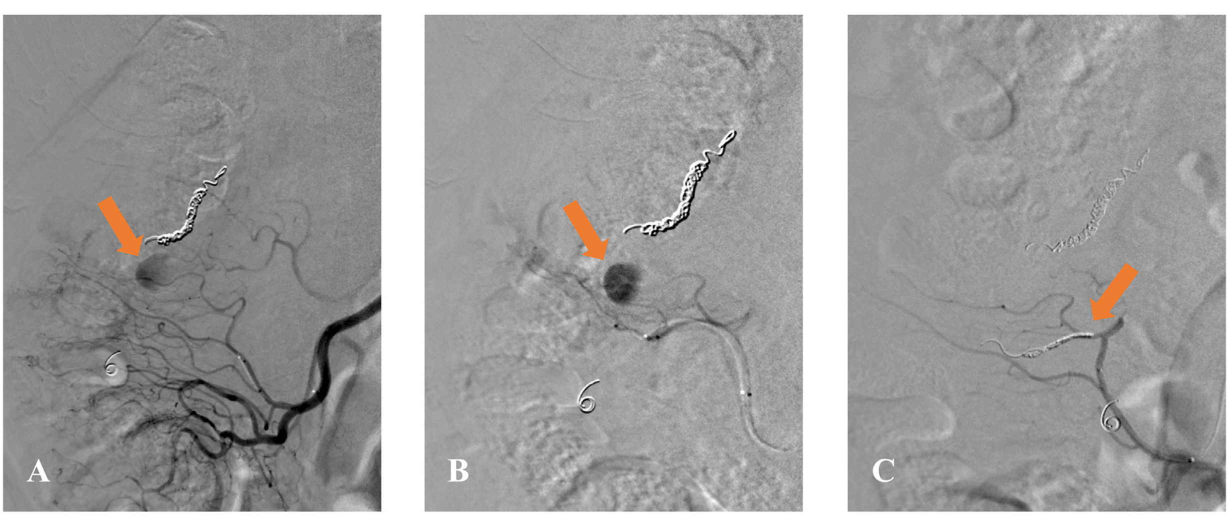

Fig. 4 – (A, B) Selective DSA of the ileocolic artery with the microcatheter shows a pseudoaneurysm (arrow). It is difficult to select the branch leading to the neck of the pseudoaneurysm. The segment including the branch is embolized with microcoils. (C) DSA after placing the microcoils confirms the disappearance of the pseudoaneurysm (arrow).

[6]. In 2009, Fargeaudou [7] reported a case of a 31-year-old woman with a left superior colonic artery pseudoaneurysm after a percutaneous renal biopsy. Shortly after the biopsy, she presented with abdominal pain and anemia. Angiography revealed active bleeding in the ruptured left superior colonic artery pseudoaneurysm [7]. In 2015, Madhusudhan [2] reported a case of a 60-year-old woman who developed a left colic artery pseudoaneurysm. After a renal biopsy, the patient presented with abdominal pain, swelling in the left flank region, and anemia. Angiography revealed a pseudoaneurysm in the ascending branch of the left colic artery [2]. Most of these cases present with abdominal pain and anemia, though there was a time lag until onset. Since the history of oral administration of antithrombotic drugs and the easy-to-bleed diseases were not particularly described in all 3 cases, it seems that no other factors affect bleeding. To the best of our knowledge, no case of ileocolic artery pseudoaneurysm after a renal biopsy has been reported. Moreover, this is the first report of multiple vascular injuries to extrarenal arteries related to renal biopsy, as far as we know.

The patient had no symptoms associated with bleeding; however, the decrease in his hemoglobin level led to the discovery of bleeding complications after the renal biopsy. Nineteen days after the renal biopsy was performed, there was little suspicion that it was the cause of anemia. Therefore, it is necessary to pay attention to delayed bleeding complications, even if there is no problem immediately after renal biopsy.

On the first CT scan, 2 lesions, but no ileocolic artery pseudoaneurysm, were identified. The following points were considered as contributing factors: First, we did not assume that the needle had advanced beyond the perirenal space around the ascending colon. Second, we concentrated too much on the 2 lesions that were detected earlier. Third, the round hyperattenuating area in the ascending colon wall could be seen in the same form in the arterial and venous phases, leading to the mistaken identification of a pseudoaneurysm as a diverticulum containing high-density fecal material. The non-contrast CT confirmed that the structure was a pseudoaneurysm due to its soft-tissue density.

All vascular structures along the puncture route can be damaged, as in this case. Therefore, bleeding complications can occur over a wide area.

In conclusion, we encountered a rare case of ileocolic artery pseudoaneurysm after renal biopsy. A wide area should be examined along the puncture route to identify the bleeding sources after renal biopsy. As bleeding complications can occur from multiple sources, all lesions should be carefully explored.

Patient consent

We have obtained and kept a written consent for publication of this case report from the patient.

Acknowledgments

We would like to thank Editage (www.editage.com) for English language editing.

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