

Then, he was admitted to the hospital with hematuria and flank pain 30 days after PCNL treatment and 25 days after the pseudoaneurysm treatment.

Contrast-enhanced CT was performed for the patient who had a 2 g/dl decrease of Hb value compared to the values at the time of preceding discharge from the hospital. In addition to active extravasation, an increased subcapsular hematoma was observed compared to the CT which was taken 5 days after the embolization treatment.

The patient was transferred back to the interventional radiology unit and DSA images were obtained for diagnostic and therapeutic purposes.

Early venous return was seen on DSA. In the images taken by selective catheterization, early venous return compatible with RAVF was observed from the vascular

structure adjacent to the previous coil (Figure 3a). The vascular structure was closed using two coils of 2 × 40 mm and 4 × 80 mm. Loss of early venous return was observed in control angiography images (Figure 3b). The patient was discharged after his hematuria regressed, his flank pain disappeared, and his Hb values did not decrease. No additional complications were found during the 2-month short follow-up period of the patient.

Discussion

The variety of surgeries and the number of interventional procedures for the kidney have increased in recent years through developments in the medical field. As the frequency of procedures such as percutaneous nephrostomy, kidney biopsy, PCNL, and partial nephrectomy increases, the complications associated with the procedures also tend to increase. The most common vascular complication after these procedures is renal pseudoaneurysm, and RAVF is less common.

In our case, RPA and RAVF on the 5th and 25th day after PCNL and RAVF were detected, respectively, and the patient was invasively treated.

The interesting point of our case is that the patient was completely asymptomatic for 25 days after the closure of the RPA, then suddenly showed RAVF symptoms, which were not seen in the first DSA. Although we do not have clear data for the reason for this incident, RAVF may have arisen for several reasons.

First, we thought when we spotted the “happy eyes” lesion, we might have focused on that and may have missed the other lesion. However, a retrospective reinterpretation of the DSA images did not yield any RAVF findings in the images taken after the RPA treatment.

Second, we may have been unable to see the RAVF during the first DSA due to vasoconstriction.

A third reason may be that the compression of the subcapsular hematoma caused a decrease in the fistula output,

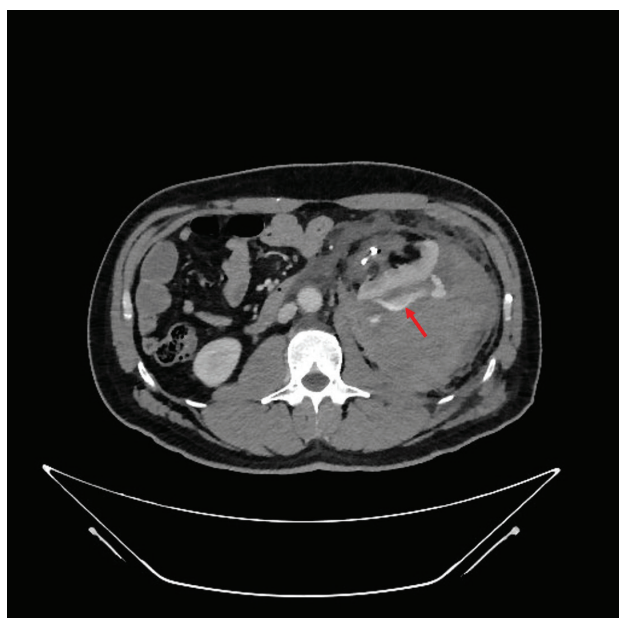


Figure 1. Contrast media extravasation around the left kidney is shown (red arrow).

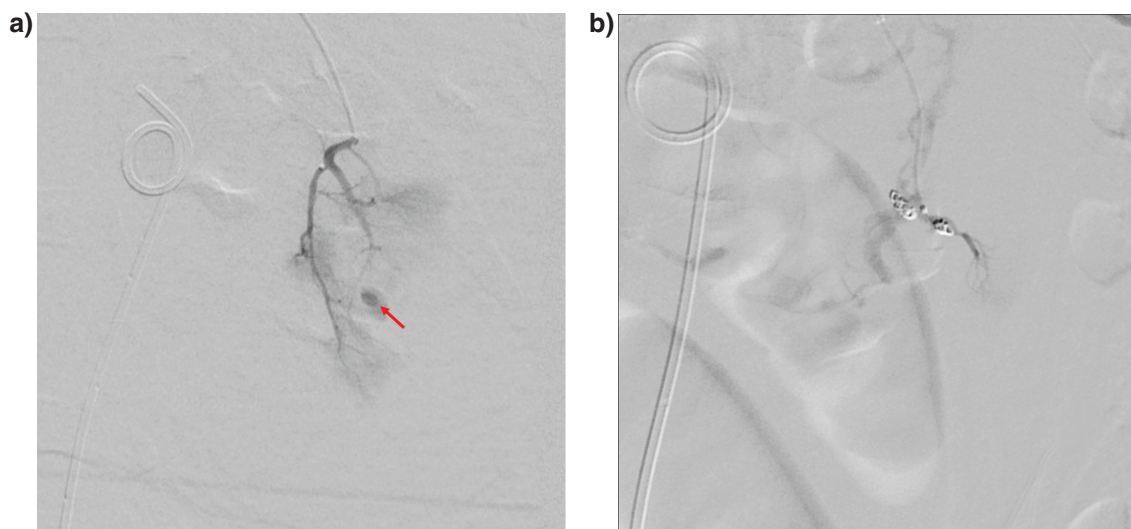


Figure 2. a) A pseudoaneurysm is observed in the lower pole of the left kidney in the DSA image. b) RPA was observed to be closed in control angiograms

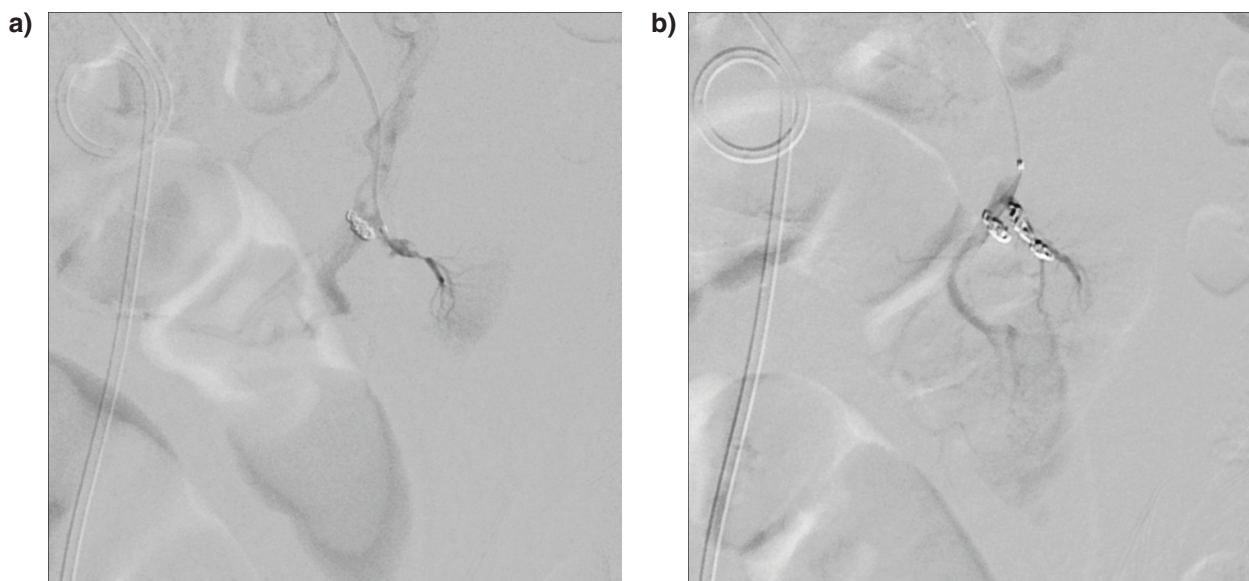


Figure 3. a) RAVF was observed from the vascular structure adjacent to the previous coil. b) Loss of early venous return was observed in control angiography images

and as the subcapsular hematoma shrank in the follow-ups, the pressure disappeared and the RAVF became high flow again.

The fourth reason may be that the RAVF was formed during the wound healing. However, we found no evidence to support these hypotheses. There is no information in the literature related to late RAVF's.

We have seen some case reports in the literature on late-stage RAVF formation after renal interventions: Shima et al. [2] detected RAVF in the contrast-enhanced CT taken after the onset of hematuria 5 days after percutaneous kidney biopsy and embolized it endovascularly. Franke et al. [3] detected an asymptomatic RAVF on color Doppler ultrasound during routine controls 3 months after percutaneous kidney biopsy and reported an endovascular treatment. Crestani et al. [4] observed a 5 cm RAVF in the second-year follow-up CT of a patient who was followed up routinely with ultrasound every 3 months and with CT every 6 months after partial nephrectomy and treated endovascularly.

Murakami et al. [5] detected RAVF 9 years after a percutaneous kidney biopsy, Ozdemir et al. [6] detected RAVF in a 7-year-old child 15 months after the biopsy and they both embolized the lesion.

Conclusion

What makes our case different from these cases is that RAVF, which could not be seen even with DSA during the first treatment, suddenly emerged with symptoms 25 days later.

From this case and the cases of delayed RAVF found in the literature can be concluded that AVF, which may often be seen in the early period after renal interventions, can also occur during the late period, and repetitive embolizations may be required for its treatment.

For this reason, it is crucial to inform and follow up with patients after renal interventions.

What is new?

From this case and the cases of delayed RAVF found in the literature can be concluded that Arteriovenous Fistula, which may often be seen in the early period after renal interventions, can also occur during the late period, and repetitive embolizations may be required for its treatment.

List of Abbreviations

CT	Computed tomography
DSA	Digital Subtraction Angiography
Hb	Hemoglobin
PCNL	Percutaneous Nephrolithotomy
RPA	Renal Pseudoaneurism
RAVF	Renal arteriovenous Fistula

Conflicts of interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

Funding

None.

Consent for publication

Written consent was obtained from the parents of the patient.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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Summary of the case

1	Patient (gender, age)	A 41-year-old male
2	Final diagnosis	Late arteriovenous fistula
3	Symptoms	hematuria and severe flank pain
4	Medications	embolization treatment.
5	Clinical procedure	
6	Specialty	Radiology