

CASE REPORT

Post-Embolization Abscess Formation in a Hemorrhagic Renal Angiomyolipoma – A Case Report

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Abstract

Background: Renal angiomyolipoma (AML) is a benign tumor, but when it grows larger than 4 cm, the risk of bleeding increases significantly. To manage this, arterial embolization is often the go-to minimally invasive treatment. While generally safe and effective, it's not completely risk-free—one of the rare but important complications is abscess formation after the procedure, which can sometimes be clinically significant.

Case Presentation: We present the case of a 45-year-old woman who came to the hospital with left flank pain. A CT scan revealed a large, hemorrhagic left renal angiomyolipoma measuring 9 cm. To control the bleeding, she underwent successful arterial embolization using gel foam. She was discharged in stable condition with a steady hematocrit. However, 21 days after the procedure, she developed fever, worsening flank pain, and tenderness. A multislice CT scan showed a liquefied mass with an air-fluid level, consistent with an abscess. To treat this, an 8-French pigtail catheter was placed under ultrasound guidance, draining 450 mL of purulent fluid. The catheter was removed after five days, and her symptoms completely resolved. Follow-up imaging at six months showed a small residual lesion (3 cm) without any fluid accumulation.

Conclusion: Abscess formation is a rare but manageable complication following arterial embolization for renal AML. This case highlights the importance of early detection and timely intervention to prevent complications and ensure a positive clinical outcome.

Keywords: Renal angiomyolipoma; Selective arterial embolization; Post-embolization complications; Abscess formation; Interventional radiology

1. Introduction

Renal angiomyolipoma (AML) is a benign mesenchymal tumor made up of varying amounts of blood vessels, smooth muscle, and fat. While many cases are asymptomatic and found incidentally, larger AMLs—especially those over 4 cm—pose a higher risk of spontaneous bleeding due to their fragile and abnormal blood vessels. This risk is even greater when intratumoral aneurysms or excessive neovascularity are present.^{1,2}

Currently, the minimally invasive method used for symptomatic or hemorrhagic angiomyolipomas (AMLs) is selective artery embolization (SAE). It effectively stops bleeding, reduces tumor size, and helps preserve kidney function. Using embolic agents—such as gel foam, particles, or coils—the technique works

by blocking the tumor's blood flow. SAE is generally safe and effective, although issues could develop even so. Post-embolization syndrome (PES) is the most common disorder marked by fever, pain, and malaise. Rarely occurring, more severe problems include abscess development, non-target embolization, or significant renal impairment.^{3,4}

This paper describes a case study of abscess development following vascular embolization for a notable hemorrhagic AML. Although rare, this consequence can result from necrosis and later embolized tissue infection. Preventing major outcomes like sepsis or serious renal damage requires timely identification and action. This case underscores the urgent need for diligent monitoring, early imaging, and prompt management to effectively address this unique post-embolization issue.

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2. Case Presentation

Presenting to the emergency department with acute left flank discomfort was a 45-year-old lady with an unremarkable medical background. The patient claimed no trauma, fever, or hematuria in the past. Examining the patient, she showed hemodynamic stability; nonetheless, the left flank was painful. Mild leukocytosis accompanied normal renal function and steady hematocrit levels, as shown by laboratory testing.

A contrast-enhanced CT scan of the abdomen revealed a large, heterogeneous density mass in the left kidney, measuring 9 cm. The mass had areas of high fat content, new blood vessels, and internal areas of high density, which were all signs of a renal angiomyolipoma (AML) with intratumoral bleeding. Although active extravasation was absent, the mass's size and vascularity indicated a significant risk for additional bleeding.

The patient underwent selective arterial embolization (SAE) of the left renal angiomyolipoma using gel foam as the embolic agent. The procedure was successful, with post-embolization angiography confirming complete occlusion of the feeding vessels. She was closely monitored postoperatively and discharged after 48 hours in stable condition, with no immediate complications and a steady hematocrit level. (Figure 1).

Twenty-one days after the procedure, the patient returned with fever, persistent left flank pain, and tenderness. Laboratory tests revealed elevated inflammatory markers and leukocytosis. A multislice CT (MSCT) scan of the abdomen showed a liquefied mass at the site of the treated AML, with an air-fluid level, indicating abscess formation. (Figure 2).

Ultrasound-guided percutaneous drainage was performed using an 8-French pigtail catheter, and approximately 450 mL of purulent fluid was aspirated. The catheter remained in place for five days, during which the patient's fever and flank pain resolved. Cultures of the drained fluid confirmed a bacterial infection, and targeted antibiotic therapy was administered based on sensitivity results.

After five days, we removed the pigtail catheter and discharged the patient in a stable state. Imaging at one and six months later showed a clear drop in lesion size, producing a residual mass of around 3 cm devoid of any indication of fluid collecting or recurrence. During the follow-up phase, the patient showed no symptoms.

This case describes the rare but clinically significant complication of abscess development following selective arterial embolization for renal angiomyolipoma. To get ideal patient outcomes, early detection, quick intervention, and frequent follow-up imaging become even more important.

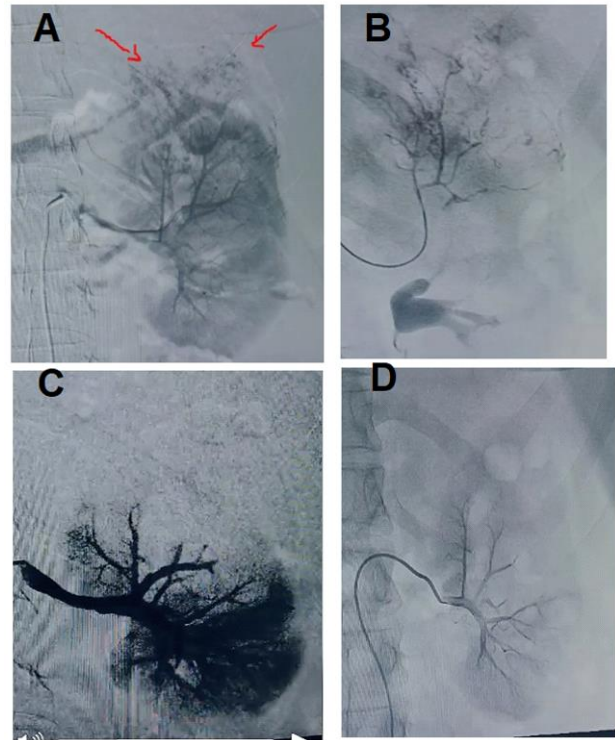


Figure 1. multiple angiographic scans for the renal angiomyolipoma: A: shows Pre embolization blush of the AML (red arrows). B: selective embolization of feeding artery of AML. C: Delayed image after embolization noted no any tumoral blush with total occluded AML and D: Normal renal tissue after embolization.

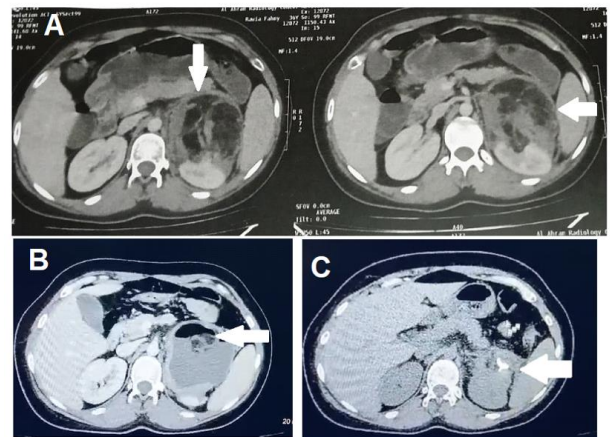


Figure 2. multiple axial MSCT of the abdomen at the renal level shows (A) Pre- embolization axial CT showing a 9 cm hemorrhagic angiomyolipoma. (B) Post- embolization MSCT showing a liquefied mass with an air-fluid level and (C) Follow-up imaging at six months showing a small residual lesion (3 cm).

3. Discussion

Particularly when their size is more than 4 cm, renal angiomyolipomas (AMLs) are benign neoplasms linked with a considerable risk of spontaneous bleeding. Selective arterial embolization (SAE) is becoming the most popular

way to treat symptomatic or hemorrhagic angiomyolipomas (AMLs). It is a minimally invasive method that effectively stops bleeding while preserving renal function. Despite the potential complications such as post-embolization syndrome, infection, abscess development, and, in rare cases, non-target embolization, SAE is generally considered safe.^{5,6}

A 45-year-old lady with a notable hemorrhagic AML received SAE with gel foam. Her initial post-procedural time was OK; three weeks later, she developed fever and flank pain. Imaging confirmed the abscess diagnosis by showing a liquefied mass with an air-fluid level. Following SAE, abscess development is rare, with an estimated frequency of less than 5%. Usually, this results from a subsequent infection of necrotic tumor tissue within the embolized AML.

SAE works by causing ischemia and necrosis in the target tumor tissue; therefore, it creates an environment fit for bacterial colonization. Although most of the time harmless, embolic agents increase the risk of infection, especially in cases of partial embolization or past infections. The patient's symptoms started later than expected, and imaging results showed an abscess. This shows how important it is to carefully watch patients who have had post-embolization and then get imaging results later on to find and treat complications quickly.^{7,8}

Imaging methods, especially ultrasonic and CT, which are crucial in the diagnosis procedure, help mainly to find post-embolization abscesses. CT provides an exact view of liquefied necrotic tissue, air-fluid levels, and surrounding inflammatory changes. The main course of treatment is percutaneous drainage, a minimally invasive approach that lessens symptoms and lowers the risk of major consequences like sepsis. Using an 8-French pigtail catheter, ultrasonic-guided percutaneous drainage efficiently removed 450 mL of purulent fluid, producing quick clinical improvement. Targeted antibiotics, guided by cultural sensitivity, improved the infection's clearance.^{9,10}

The patient showed good recovery; six-month follow-up imaging revealed only a small residual lesion free of fluid accumulation or recurrence. This matches observations in related conditions, when embolized AMLs gradually decrease with time. Detecting possible recurrence, persistent infection, or other late issues depends on constant monitoring, which also guarantees long-term clinical stability.^{11,12}

It's important to know that abscesses can form after selective arterial embolization for renal angiomyolipoma, which happened in this case. Early identification depends on careful observation for weeks following embolization for symptoms including fever, discomfort, and

localized tenderness. Attaining the best results requires timely imaging and action.

Although this instance was under control, the basic processes and risk factors for abscess development after SAE are yet poorly known. There is still a need for a more precise description of the risk profile and further research into preventative measures, such as how likely it is that preemptive antibiotics will help patients who are already experiencing SAE.

Abbreviations:

AML: Angiomyolipoma

SAE: Selective Arterial Embolization

CT: Computed Tomography

MSCT: Multislice Computed Tomography

PES: Post-Embolization Syndrome

8F: 8-French (catheter size)

4. Conclusion

An unusual but under control side effect of selective arterial embolization for renal angiomyolipoma is abscess development. This example emphasizes the need for early identification, fast imaging, and quick response with antibiotics and drainage to reach the best results. This emphasizes the need for extensive post-procedural follow-up to ensure long-term patient safety and watch for postponed problems.

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