Article published online: 2025-06-24

Embolization of Gluteal Pseudoaneurysm Using the LAVA Liquid Embolic System

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Indian J Radiol Imaging 2026;36:147–148.

The LAVA Liquid Embolic System (LES) (BlackSwan Vascular, Inc.) received Food and Drug Administration approval in October 2023 for use in patients with peripheral vascular hemorrhage.[1] Given its recent approval, limited published literature exists on its clinical use. The authors report using this embolic to successfully treat a gluteal pseudoaneurysm secondary to percutaneous transgluteal drain placement.

A 30-year-old female with a complex postpartum history—comprising postpartum hemorrhage requiring uterine artery embolization, endometritis, and a deep pelvic abscess requiring transgluteal drain placement—presented for routine drain removal. Following the removal of the drain, the patient experienced significant bleeding from the drain insertion site, suggesting a vascular injury that was being tamponaded by the drain. Computed tomography angiography of the pelvis revealed a pseudoaneurysm in the left gluteus maximus along the removed transgluteal drain tract (►**Fig. 1**). Emergent catheter angiography of the left superior gluteal artery confirmed a pseudoaneurysm with extravasation (►**Figs. 2** and **3**). A 2.4F Progreat (Terumo Interventional Systems) microcatheter with a nondetachable tip was primed with 0.5 mL dimethyl sulfoxide (DMSO), and 0.2 mL LAVA 34 was slowly injected, filling the pseudoaneurysm, inflow branch, and distal outflow. Postembolization angiography showed successful occlusion with preserved gluteal muscle perfusion (►**Fig. 4**). The patient was discharged the following day.

The LAVA LES is approved for peripheral vascular hemorrhage and is an injectable, nonadhesive liquid embolic agent composed of ethylene vinyl alcohol (EVOH) copolymer dissolved in DMSO with suspended micronized tantalum powder. As DMSO dissipates into the blood, EVOH precipitates, forming a spongy, coherent embolus, while tantalum remains in place for fluoroscopic visualization.

LAVA LES was selected for this case due to its controlled, cohesive flow, allowing deep arterial penetration while preventing backflow into the pseudoaneurysm via collaterals. Specifically designed for peripheral circulation, it is optimized for viscosity, radiopacity, and vial volume to enhance procedural precision and effectiveness.[2] Unlike traditional liquid embolic agents like glue (n-butyl cyanoacrylate, Johnson & Johnson) or Onyx LES (Medtronic), typically supplied in 1 mL vials, the LAVA comes in larger vials, up to 6 mL, making it better suited for peripheral interventions where larger volumes are often needed. LAVA LES offers advantages over other

Fig. 1 Axial computed tomography angiography (CTA) of the pelvis immediately after drain removal demonstrating pseudoaneurysm (arrow) within the left gluteal region along the transgluteal drain tract.

article published online
June 24, 2025

DOI https://doi.org/10.1055/s-0045-1809413.
ISSN 0971-3026.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

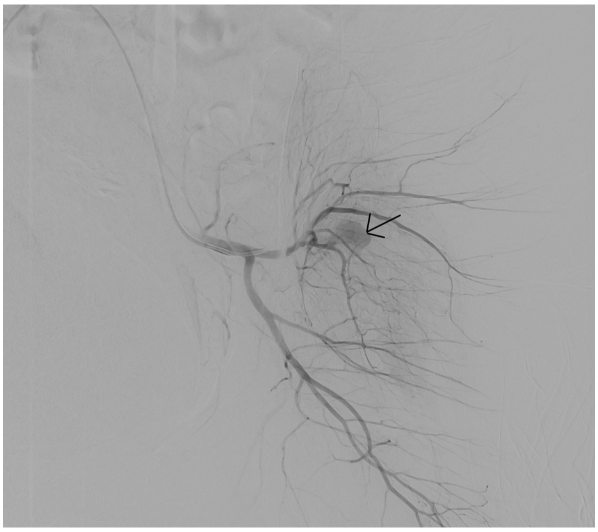

Fig. 2 Digital subtraction angiography (DSA) of the left internal iliac artery demonstrating the pseudoaneurysm (arrow) arising from a branch of the left superior gluteal artery.

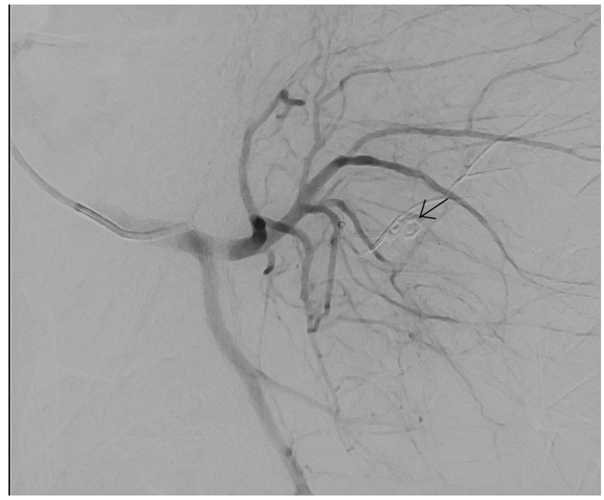

Fig. 4 Postembolization angiography of the left internal iliac artery demonstrating cessation of flow within the pseudoaneurysm (arrow).

liquid embolic agents like Onyx, PHIL, and Squid due to its lower viscosity, enabling smoother injection and better distal penetration. A prospective LAVA study reported no complications such as aggregate formation, catheter entrapment, target organ ischemia, or infarction.[2] In contrast, Onyx embolization procedures have been linked to complications, including catheter entrapment, serious injuries, and malfunctions.[4] While available extra-low viscosity versions of Squid and PHIL allow deeper penetration, they also pose risks like ineffective proximal plug formation and nontarget embolization, which were not observed with LAVA LES.[5] However, further research and randomized controlled trials are needed to confirm its long-term advantages over other liquid embolic agents.

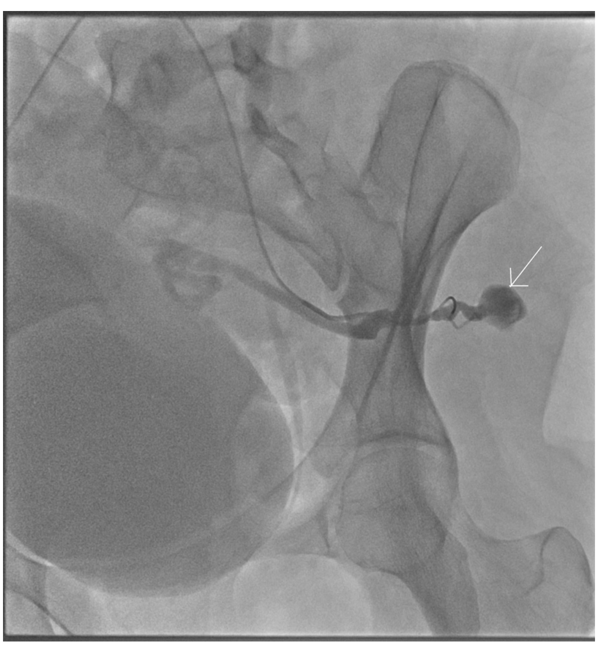

Fig. 3 Selective angiography of the branch of the superior gluteal artery demonstrates the pseudoaneurysm (long arrow) and active extravasation along the drain tract medially into the pelvis (short arrow).

Like Onyx, which is commonly used in neurovascular procedures,[3] LAVA is cohesive and nonadhesive, enabling it to flow precisely and fill complex vascular structures, minimizing the risk of nontarget embolization. Unlike glue, where there is a risk of catheter tip retention due to its rapid polymerization, LAVA can be injected in a controlled fashion and the catheter can be safely pulled out from the embolic mass without displacing it.

This is the first reported case in published literature that showcases LAVA's potential as an effective embolic agent for peripheral vascular hemorrhage, and its potential use as a versatile liquid embolic agent for other peripheral embolization applications. LAVA could serve as a valuable addition to the interventional radiologist's toolkit.

Conflict of Interest
None declared.

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