

Posterior Tibial Artery Pseudoaneurysm Mimicking an Abscess after Tibial Interlocking Nailing: A Case Report

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ABSTRACT

Postoperative swelling following fracture fixation is commonly attributed to infection, seroma, or haematoma. However, rare vascular complications such as pseudoaneurysm can closely mimic an abscess and pose a diagnostic challenge. We report a case of posterior tibial artery pseudoaneurysm presenting as a suspected abscess in a 45-year-old male following intramedullary interlocking nailing for a distal third tibia-fibula fracture sustained in a road traffic accident. Three weeks postoperatively, the patient presented with a painful, progressively enlarging swelling with local warmth and erythema. Laboratory parameters showed mildly elevated inflammatory markers. Clinical suspicion of abscess was reconsidered due to the presence of an expansile, mildly pulsatile swelling with reduced distal pulses. Colour Doppler ultrasonography demonstrated a characteristic Yin-Yang sign, and CT angiography subsequently confirmed a pseudoaneurysm arising from the posterior tibial artery. The patient was successfully treated with endovascular embolisation, with complete resolution of symptoms and preserved limb perfusion. This case highlights the importance of considering vascular injuries in atypical post-operative swellings.

Keywords: Endovascular procedures, Postoperative complications, Road traffic accidents, Tibial fractures

CASE REPORT

A 45-year-old male presented following a road traffic accident with complaints of pain, swelling, and deformity of the right leg to the department of orthopaedics. There was an alleged history of road traffic accident and sustained injury to right leg. There was no significant past history and no history of drug allergy. Local examination showed swelling, tenderness at fracture site and restriction of range of movements. Neurovascular examination at presentation showed intact distal pulses and normal capillary refill. Radiographs revealed a closed fracture of the distal one-third tibia and fibula [Table/Fig-1]. The patient underwent closed reduction and intramedullary interlocking tibial nailing at our institute.



[Table/Fig-1]: X-ray right leg AP and lateral views showing pre-operative tibia and fibula fracture.

Distal locking was performed using a freehand technique under fluoroscopic guidance. The surgery was uneventful, and immediate postoperative recovery was satisfactory [Table/Fig-2].



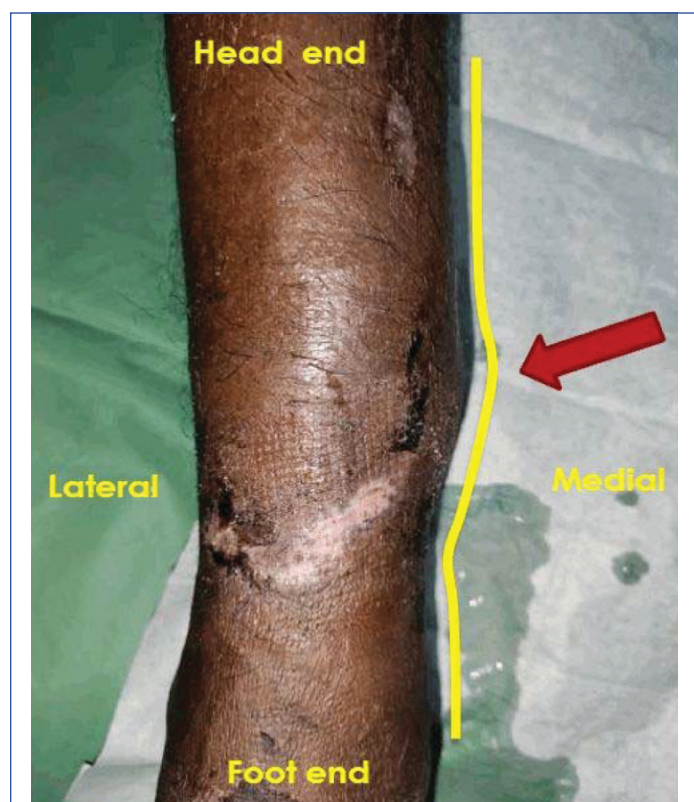
[Table/Fig-2]: Postoperative Intramedullary Interlocking (IML) nailing X-ray.

Three weeks later, the patient returned to our institute with a gradually increasing swelling over the distal leg associated with mild pain, warmth, and erythema. There was no fever or systemic symptoms. On examination, the swelling was tense, expansile, and mildly pulsatile [Table/Fig-3].

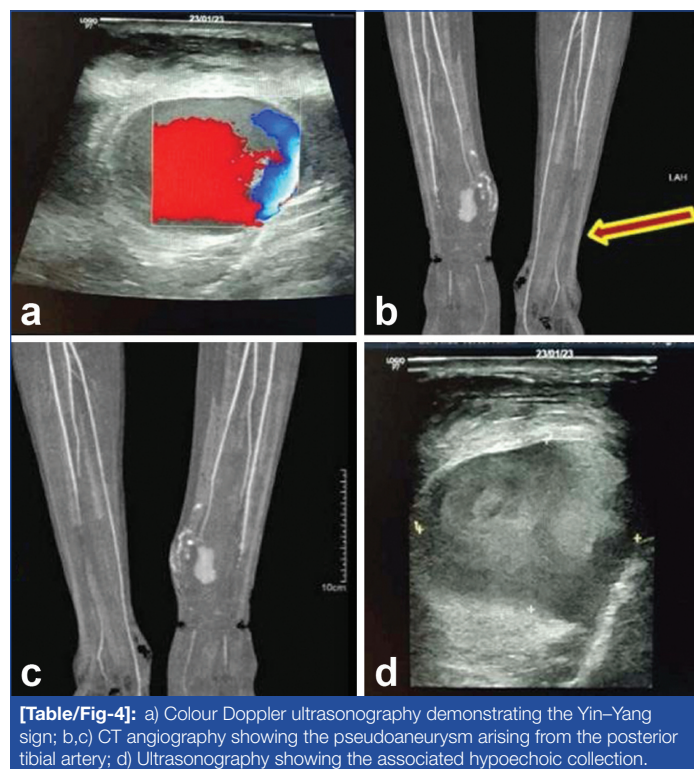
Distal pulses were palpable but reduced compared to the contralateral limb. Laboratory investigations revealed elevated inflammatory markers {White Blood Cell (WBC): 11,200/mm³ (normal: 4,500–11,000/mm³); Erythrocyte Sedimentation Rate (ESR): 32 mm/hr (0–15 mm/hr); C-Reactive Protein (CRP): 14 mg/L

(normal: 0-5 mg/L)), initially supporting a diagnosis of infection. However, the presence of pulsatility raised suspicion of a vascular lesion. Colour Doppler ultrasonography revealed a characteristic Yin–Yang sign, suggestive of pseudoaneurysm [Table/Fig-4a].

The CT angiography then confirmed a pseudoaneurysm arising from the posterior tibial artery adjacent to the distal nail trajectory [Table/Fig-4b,c]. Ultrasonography also demonstrated the associated hypoechoic collection [Table/Fig-4d].



[Table/Fig-3]: Clinical image showing swelling at the junction of middle 1/3rd and distal 1/3rd of right leg which was tense, expansile, and mildly pulsatile.



[Table/Fig-4]: a) Colour Doppler ultrasonography demonstrating the Yin–Yang sign; b,c) CT angiography showing the pseudoaneurysm arising from the posterior tibial artery; d) Ultrasonography showing the associated hypoechoic collection.

On vascular assessment, the affected limb demonstrated delayed but present capillary refill (~3 seconds) compared to the contralateral side (~2 seconds). The dorsalis pedis pulse was palpable but reduced in volume, while the posterior tibial pulse was diminished

when compared with the opposite limb. The Ankle–Brachial Index (ABI) was 0.85 on the affected side (contralateral limb: 1.0), indicating mild arterial compromise. The swelling was noted to be expansile and mildly pulsatile on palpation. No audible bruit was detected over the swelling. Distal limb perfusion was maintained, with no evidence of ischemic changes such as pallor, paraesthesia, or motor deficit. The case was discussed in a multidisciplinary setting involving orthopaedic and vascular surgery teams. Considering the contained nature of the lesion, preserved distal perfusion, and absence of active haemorrhage, endovascular embolisation was preferred over open surgical repair.

The rationale included minimally invasive approach, lower risk of operative blood loss, avoidance of extensive soft tissue dissection near fracture site, faster recovery and preservation of fracture stability.

The patient subsequently underwent successful endovascular coil embolisation, resulting in complete resolution of the pseudoaneurysm while maintaining adequate distal circulation at the same institute.

The procedure was successful, with preservation of distal limb perfusion and gradual resolution of swelling. At two months' follow-up, the patient was ambulating with full weight bearing, had normal knee and ankle range of motion, and demonstrated stable fracture fixation with progressive union. The patient was further followed clinically up to six months, during which no recurrence of swelling or vascular symptoms was noted, and limb perfusion remained adequate [Table/Fig-5].



[Table/Fig-5]: Postvascular surgery six months follow-up with no restriction of range of movement.

DISCUSSION

Intramedullary nailing is a widely accepted treatment for tibial shaft fractures with good outcomes and low complication rates [1]. Vascular complications such as pseudoaneurysm are rare but have been reported after tibial nailing [2,3]. These injuries are usually iatrogenic and may result from drill bits, guide wires, reamers, or, most commonly, distal locking screws, particularly in distal-third fractures where the posterior tibial artery lies close to the posterior cortex [4,5]. Several case reports have described pseudoaneurysm after tibial fixation, and some were initially mistaken for abscess or haematoma, thereby increasing the risk of inappropriate incision and major haemorrhage [6-9].

In the present case, the delayed presentation and inflammatory features initially suggested infection; however, the expansile nature

of the swelling, mild pulsatility, and reduced distal pulses raised suspicion of a vascular lesion. Colour doppler ultrasonography served as the initial screening investigation by demonstrating the characteristic Yin–Yang sign, whereas CT angiography provided definitive diagnosis, accurate anatomical localisation, and guidance for treatment planning [6,7]. A similar posterior tibial artery pseudoaneurysm has been reported with successful open repair using a venous patch, underscoring the need for timely recognition and individualised management strategies [7].

The most likely mechanism in this patient was iatrogenic injury during distal locking screw placement, with drill or screw penetration beyond the posterior cortex causing delayed pseudoaneurysm formation. Endovascular treatment has emerged as an effective minimally invasive option in selected patients because it offers high technical success, reduced soft-tissue disruption, and lower morbidity compared with open surgical repair [10]. This case emphasises the importance of maintaining a high index of suspicion for vascular injury in atypical postoperative swellings following tibial nailing.

CONCLUSION(S)

Pseudoaneurysm should be considered in atypical postoperative swellings following tibial nailing, particularly when pulsatility or vascular signs are present. Early diagnosis using Doppler ultrasonography and CT angiography allows prompt management and prevents life-threatening complications.

REFERENCES

- [1] Larsen P, Elsoe R, Hansen SH, Graven-Nielsen T, Laessoe U. Incidence and epidemiology of tibial shaft fractures. *Injury*. 2015;46(4):746-50. Doi: 10.1016/j.injury.2014.12.027.
- [2] Greve F, Crönlein M, Beirer M, Kirchhoff C, Biberthaler P, Braun KF. Pseudoaneurysm of the anterior tibial artery after interlocking tibial nailing: An unexpected complication. *Eur J Med Res*. 2016;21:36. Doi: 10.1186/s40001-016-0231-z.
- [3] Gahlot N, Kanojia RK. Anterior tibial artery pseudoaneurysm due to interlocking bolt of tibial nail: A case report and review. *Acta Orthop Traumatol Turc*. 2017;51(1):77-83. Doi: 10.1016/j.aott.2015.01.001.
- [4] Venkatesh A, Natarajan M, Rajasekaran S. Pseudoaneurysm following intramedullary nailing of tibia: A case report. *J Orthop Case Rep*. 2013;3(4):25-28. Doi: 10.13107/jocr.2250-0685.120.
- [5] Chandra A, Rao SK, Kumar A. Pseudoaneurysm masquerading as abscess following orthopedic procedures. *Indian J Orthop*. 2016;50(3):332-36. Doi: 10.4103/0019-5413.181789.
- [6] Acar M, Wuertzer SD. Anterior tibial artery pseudoaneurysm following tibial nailing managed with coil embolization. *J Orthop Case Rep*. 2025;15(10):6156. Doi: 10.13107/jocr.2025.v15.i10.6156.
- [7] Beijers JHC, Daniels AM, Cuijpers ACM, Samyn MG. Posttraumatic pseudoaneurysm of the posterior tibial artery: A case report. *Ann Vasc Surg Brief Rep Innov*. 2024;4(4):100347. Doi: 10.1016/j.avsur.2024.100347.
- [8] Ghaffari S, Farsavian H, Daneshpoor SMM, Azar MS. Pseudoaneurysm of the posterior tibial artery following removal of tibial plate - A rare case. *J Orthop Case Rep*. 2016;6(3):46-49. Doi: 10.13107/jocr.2250-0685.500.
- [9] Wooster BM, Grimm NL, Dorsey NS, Brigido SA. Iatrogenic arteriovenous fistula with associated pseudoaneurysm of the posterior tibial artery after revision total ankle arthroplasty: A case report. *J Foot Ankle Surg*. 2017;56(2):408-12. Doi: 10.1053/j.jfas.2016.09.014.
- [10] Spirito R, Trabattori P, Pompilio G, Zoli S, Agrifoglio M, Biglioli P. Endovascular treatment of a post-traumatic tibial pseudoaneurysm and arteriovenous fistula: Case report and review of the literature. *J Vasc Surg*. 2007;45(5):1076079. Doi: 10.1016/j.jvs.2006.12.038.

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