Successful Coil Embolization of a Large Anterior Tibial Artery Pseudoaneurysm After Open Reduction Internal Fixation of a Bicondylar Tibial Plateau Fracture

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Introduction

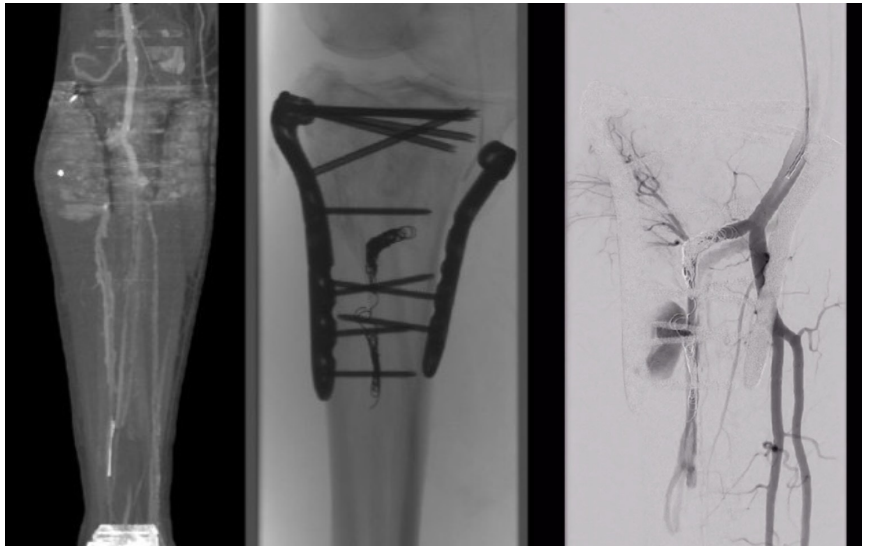
Pseudoaneurysms consist of turbulent blood flow between the outside layers of the arterial wall, the tunica media, and tunica adventitia. This pathology typically develops after blunt trauma injury to an artery or after catheter-based vascular interventions, but rarely, from arterial injury during orthopedic pinning procedures. Our literature review identified only two cases of tibial artery pseudoaneurysm following closed intermedullary nailing of a proximal tibial fracture.

Case Study

- A 56-year-old male presented to the Emergency Department after a fall from a ladder, sustaining a displaced right tibial plateau bicondylar fracture with associated comminuted fibular head fracture.
- The fracture was reduced and repaired 20 days later via open reduction internal fixation (ORIF).
- Patient presented 6 months later with an enlarging, pulsatile mass in the lateral aspect of his right lower extremity. CT angiogram revealed a large 10 x 7.8 x 5.5 cm partially thrombosed pseudoaneurysm within the proximal anterior tibial artery, with distal flow into the dorsalis pedis artery.
- The delay in definitive orthopedic repair and presumably adequate visualization of vital structures during open repair suggested the pseudoaneurysm likely resulted from the misaligned orthopedic plates and screws rather than the inciting trauma [Figure 1].
- Selective diagnostic angiogram showed patent popliteal artery, tibio- peroneal trunk, peroneal artery, anterior tibial, and posterior tibial artery. The pseudoaneurysm was within the proximal anterior tibial artery and had a large neck.
- 3 coils were inserted: one at the neck of the pseudoaneurysm and two below and above the neck of the pseudoaneurysm.
- Completion angiography showed reduced inflow to the pseudoaneurysm. Five months post-operatively, there was no flow and decreased in size to 8 x 5 x 5cm [Figure 1].

Conclusion

We report a rare proximal anterior tibial artery pseudoaneurysm developing after ORIF of a displaced right tibial plateau bicondylar fracture. Clinical findings, CT angiogram, and selective tibial angiography provided the visualization and understanding of the anatomy that enabled endovascular repair of this iatrogenic pseudoaneurysm that apparently was caused by misplaced orthopedic screws. Although it is unusual, pseudoaneurysms should be kept on the clinical radar after ORIF of tibial plateau injuries.



A: CTA of pseudoaneurysm prior to endovascular intervention. B: Post-embolization angiogram revealing decreased flow within the pseudoaneurysm. C: Fluoroscopic view of coil placement in the anterior tibial artery.