AAST Acute Care Surgery Didactic Curriculum

Popliteal Artery Injury

Jason D. Sciarretta, MD, FACS

Highlights:

- Popliteal vessel injuries remain uncommon accounting for 0.2% of all traumas.
- Vessel debridement is mandatory prior to vascular reconstruction.
- Geniculate branches are preserved making primary popliteal artery repair restricted.
- Injuries often require reconstruction with a reverse saphenous vein form the contralateral limb.
- Closed reduction or external fixation in the OR is often necessary prior to reconstructions.
- Current amputation rates are ~ 5%.
    - Contemporary popliteal artery/vein injury management does not increase amputation risk.
- Endovascular repair options for popliteal arteries have been extremely limited.
    - Stent durability in highly mobile region of the extremity can lead to device failure.
        - Outcomes for bare metal stents use for popliteal trauma is very limited.

Diagnosis:

- Life-threatening hemorrhage and/or acute ischemia are the most common physical findings.
- Imaging may or may not be necessary unless multiple ballistics injuries or pre-existing PAD.
- Changes in vascular clinical exam may indicate injury.
    - Ankle-brachial index (ABI) <0.9 warrants further imaging.
        - May be abnormal in elderly patients from atherosclerotic disease.
        - Fracture alignment and traction may be necessary for orthopedic injury.
- CTAs **(Figure 1 & 3)**
    - excellent sensitivity and specificity in detecting and characterizing arterial injury.

Figure 1: (A) Crush injury with pulseless bilateral lower extremities and complex comminuted open fractures of thighs and legs.**(B)** CTA lower extremities with bilateral popliteal arteries occlusions (arrows).

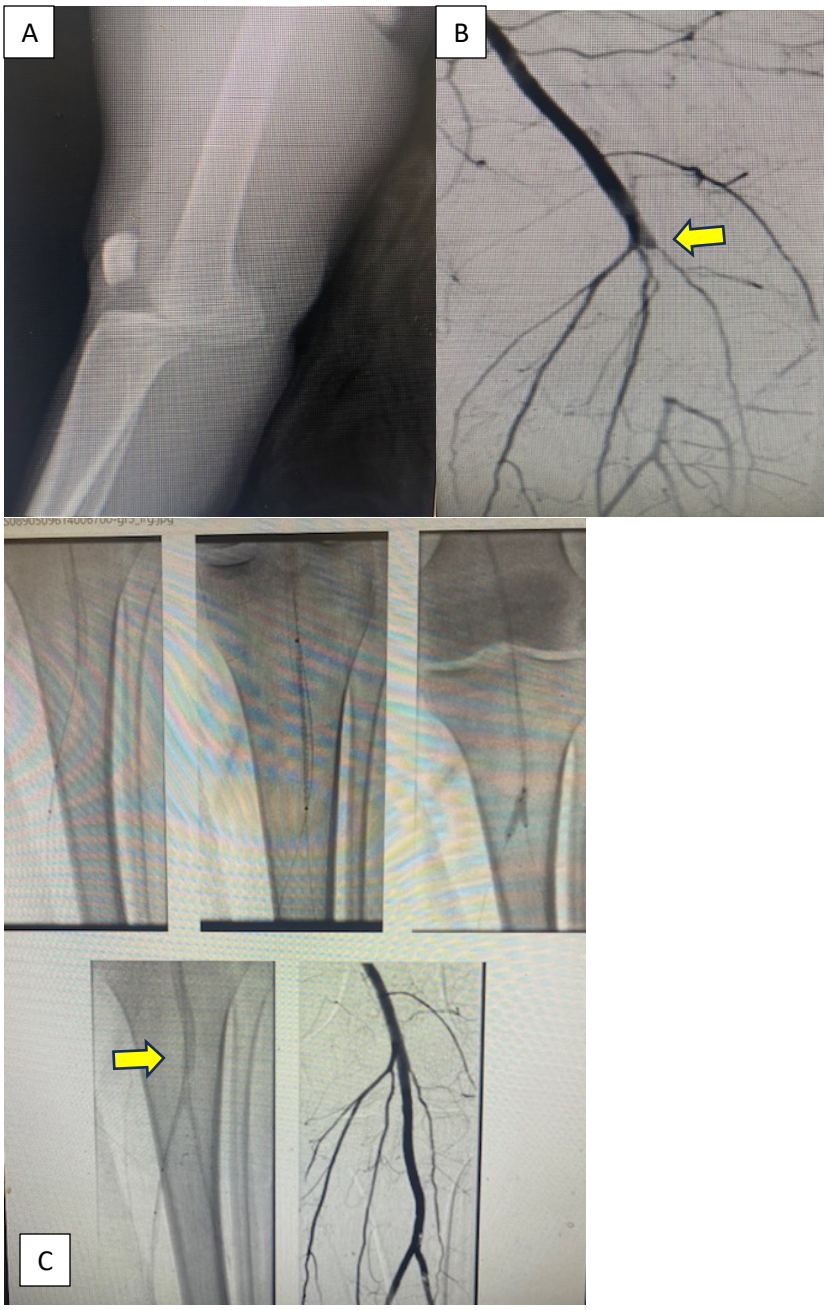

Figure 2 (A) anteromedial dislocation of the medial femoral condyle, a slight depression of the medial tibial plateau, and a fibular head fracture. **(B)** Angiography with a distal popliteal artery occlusion (arrow) with reconstitution of the tibioperoneal trunk and anterior tibial via genicular collaterals. **(C)** 6-mm × 10-cm heparin-bonded Viabahn stent (arrow) was placed along the occluded portion of the popliteal artery to the tibioperoneal trunk, and balloon angioplasty

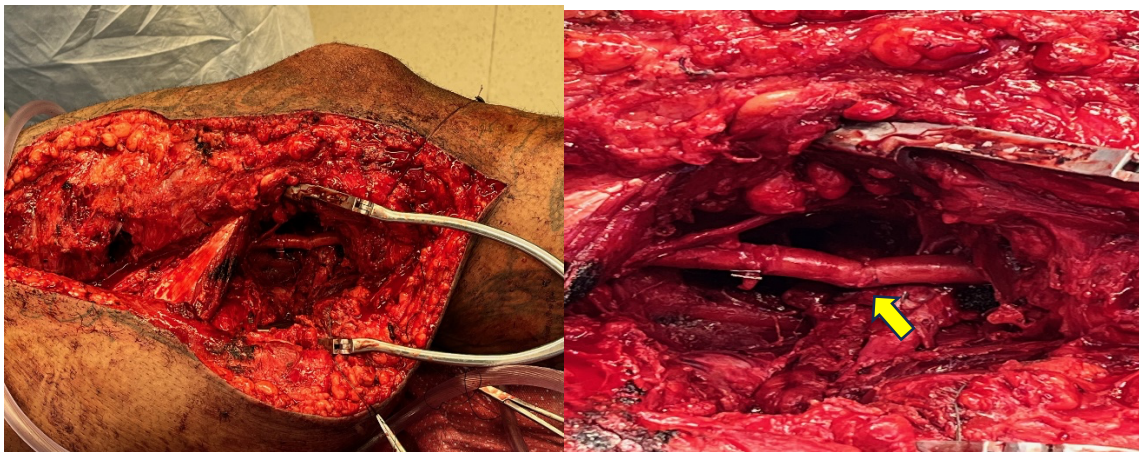

Figure 3: A left Above knee exposure from a medial incision with popliteal artery repair (arrow).