AAST Acute Care Surgery Didactic Curriculum

Femoral Artery Injury

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Femoral Artery Injury – diagnosis and management

Highlights:

- Penetrating injury is the most common mechanism.
- Hemorrhage from blunt injury is rare and likely from an associated fracture.
- Approximately 30-45% of patients present in hemorrhagic shock.
    - Majority present with hard signs of vascular injury
- Tourniquets are less feasible w/ common femoral (CFA) or proximal superficial femoral artery (SFA) injuries. Direct pressure on or above the injury can prevent exsanguination.
- Morbidity remains high, despite improved detection, operative techniques, and follow-up.
- One in 20 femoral artery injury patients develop compartment syndrome requiring fasciotomies.
- Endovascular repair is on the rise for femoral arterial injuries with acceptable outcomes
- Profunda femoral artery is not essential to reconstruct if SFA patent.
- When damage control is initiated, shunting is necessary for prompt reperfusion.
- Risk of limb loss is low.

Diagnosis:

Highlights:

- Changes in the 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 injuries.
- CTAs **(Figure 1)** are associated with higher rates of endovascular or hybrid repair and observation (Romagnoli et al.).

Operative Principles:

Highlights:

- Endovascular technique is considered for incomplete transections **(Figure 2)**
- Longitudinal thigh incision, proximal & distal control w/ vascular clamps & silastic vessel loops.

    - Challenging proximal CFA injuries may require transection of the inguinal ligament or require a laparotomy for proximal control of the external iliac artery.
- Tension free anastomosis with mobilization of vessel injury **(Figure 3)**
    - Utilization of heparinized saline (50U/ml)
    - Fogarty catheter to ensure the absence of a thrombus.
- Debridement of the injured vessel
    - Short segment injuries: primary repair
    - Long segment (>2cm): reverse saphenous vein graft or PTFE graft (8-10mm)
        - PTFE has acceptable infection & patency rates.
            - second choice when vein is not available.

- Evaluate the need for 4-compartment fasciotomies.
- On table arteriogram is considered to confirm no emboli or distal thrombosis
- Any arterial repair must be covered in its entire length.
    - Challenges exist with extensive soft tissue loss.
        - Muscle flap may be indicated ie. sartorius rotational flap

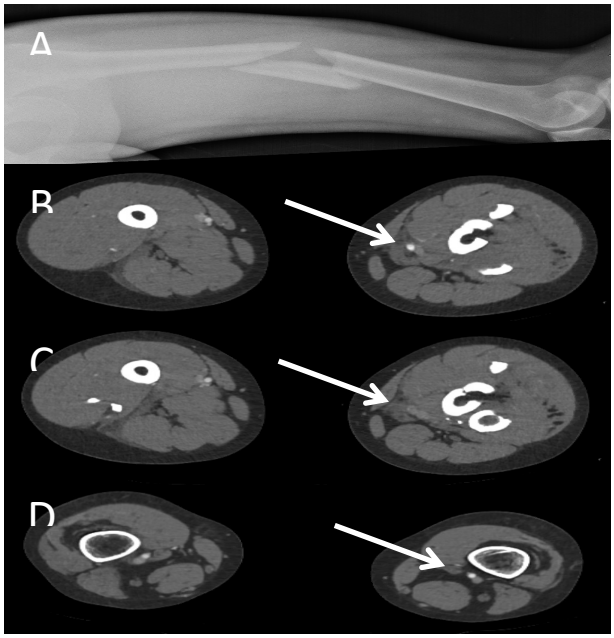

FIGURE 1: (A) Left femoral Closed butterfly fracture **(B)** Femoral artery above the site of occlusion. **(C)** Evidence of occlusion of the femoral artery with intimal derangement. **(D)** Distal reconstitution of the femoral artery.

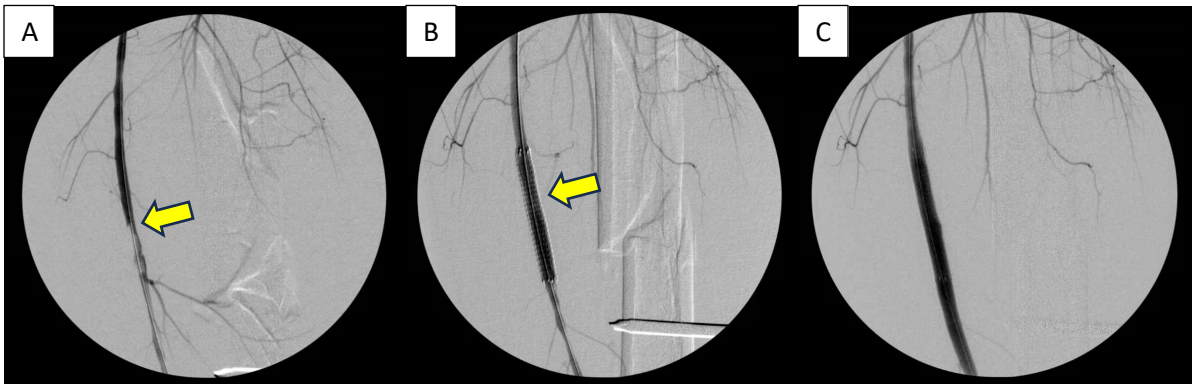

FIGURE 2: (A) Evidence of persistent flow defect (arrow) in the left superficial femoral artery. **(B)** Placement of covered stent (arrow) within the superficial femoral artery. **(C)** Successful repair of the left superficial femoral artery without flow-limiting stenosis.

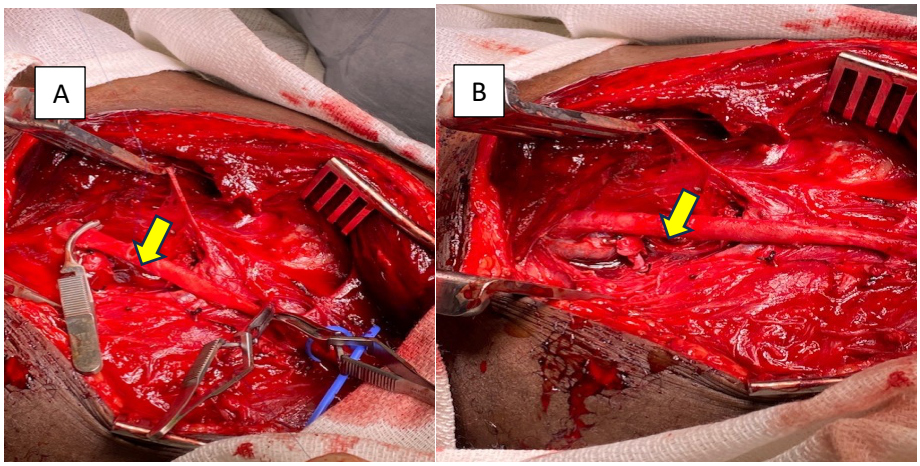

FIGURE 3: (A) short segment CFA injury with proximal and distal control. (**B)** primary end to end anastomosis with 5-0 polypropylene following circumferential debridement.