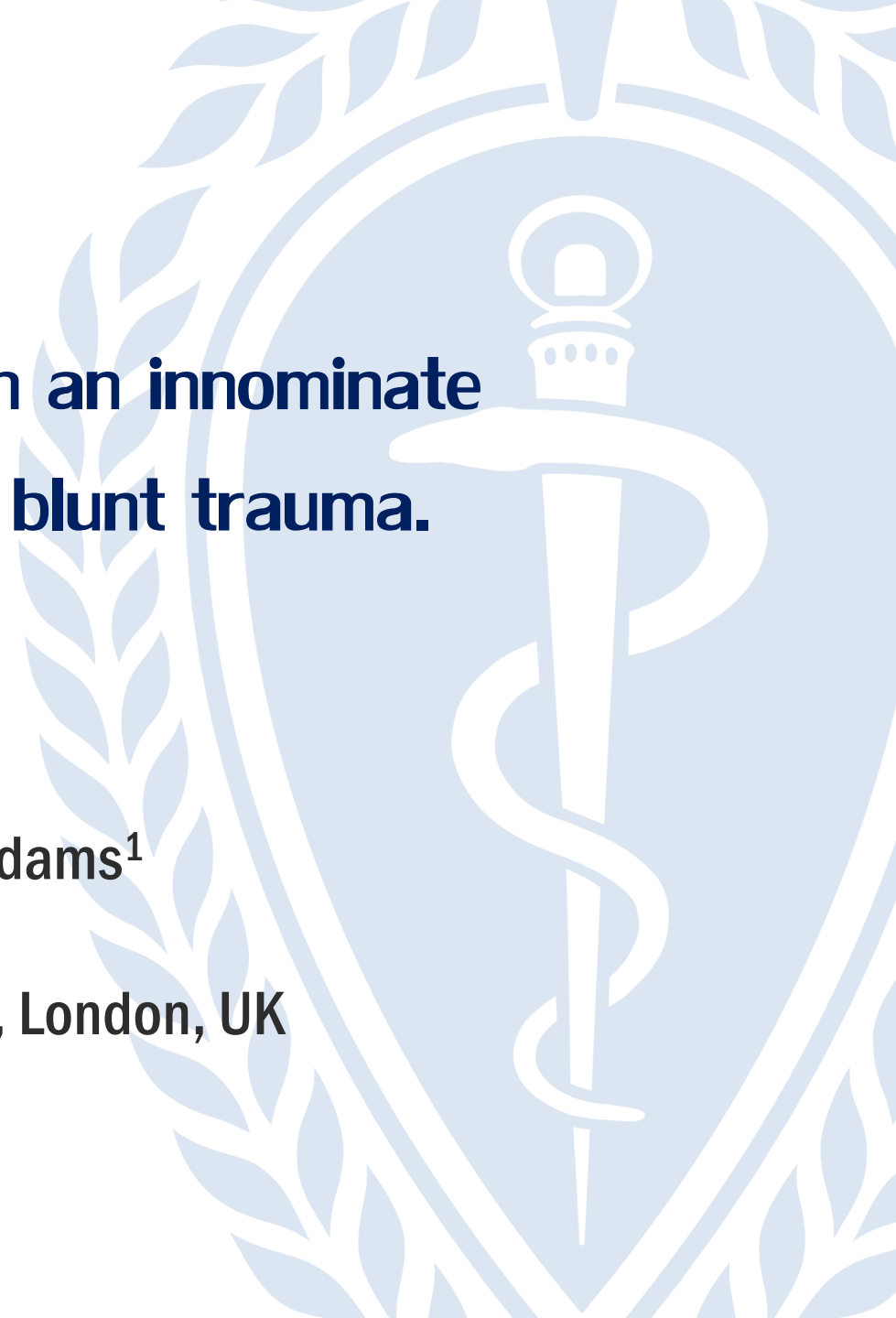


Surgical management of a patient with an innominate artery pseudoaneurysm secondary to blunt trauma.

Luke Holland¹, Karim Brohi², John Yap¹, Benjamin Adams¹

1. Barts Heart Centre, St. Bartholomew's Hospital, London, UK

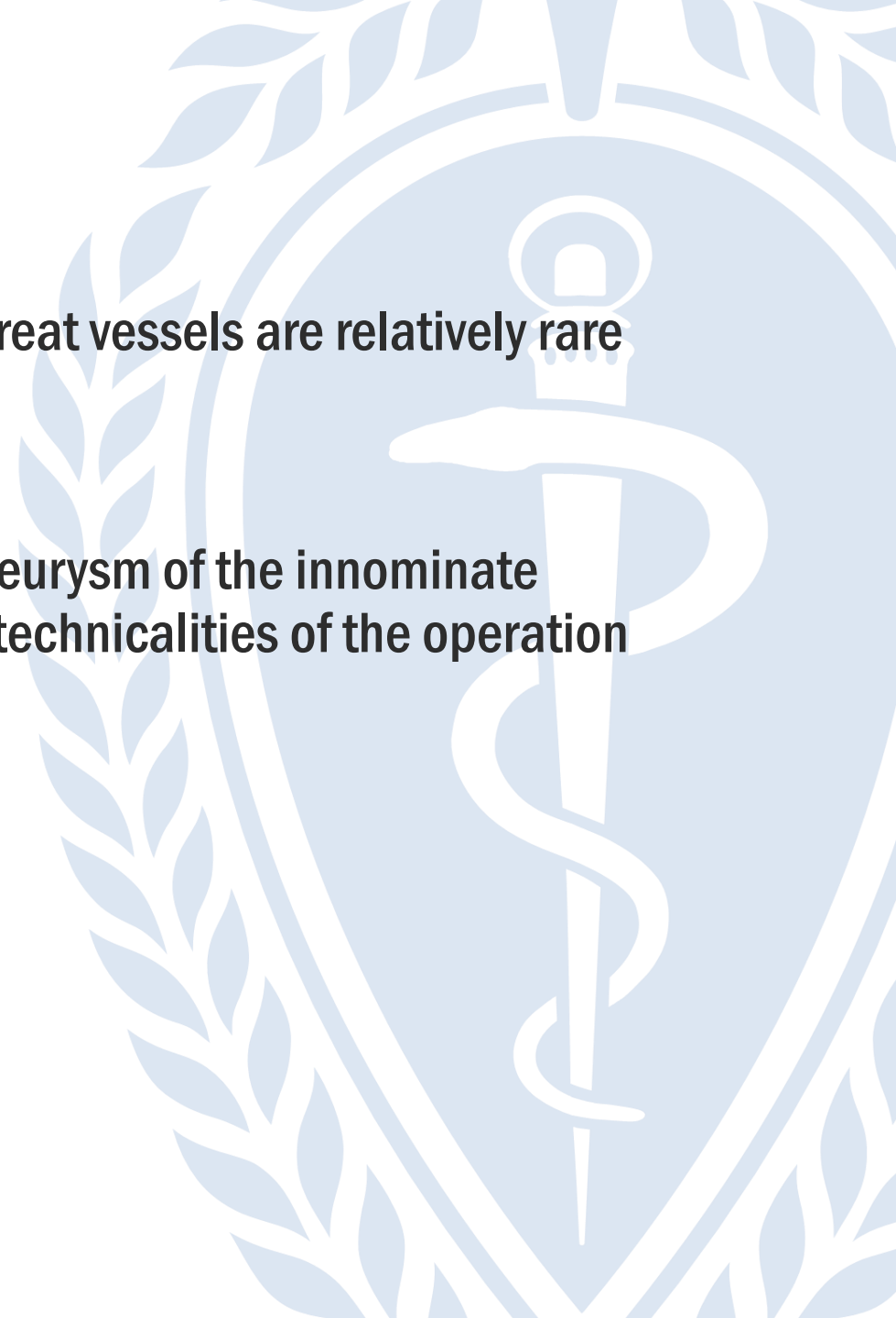
2. Royal London Hospital, UK



Introduction

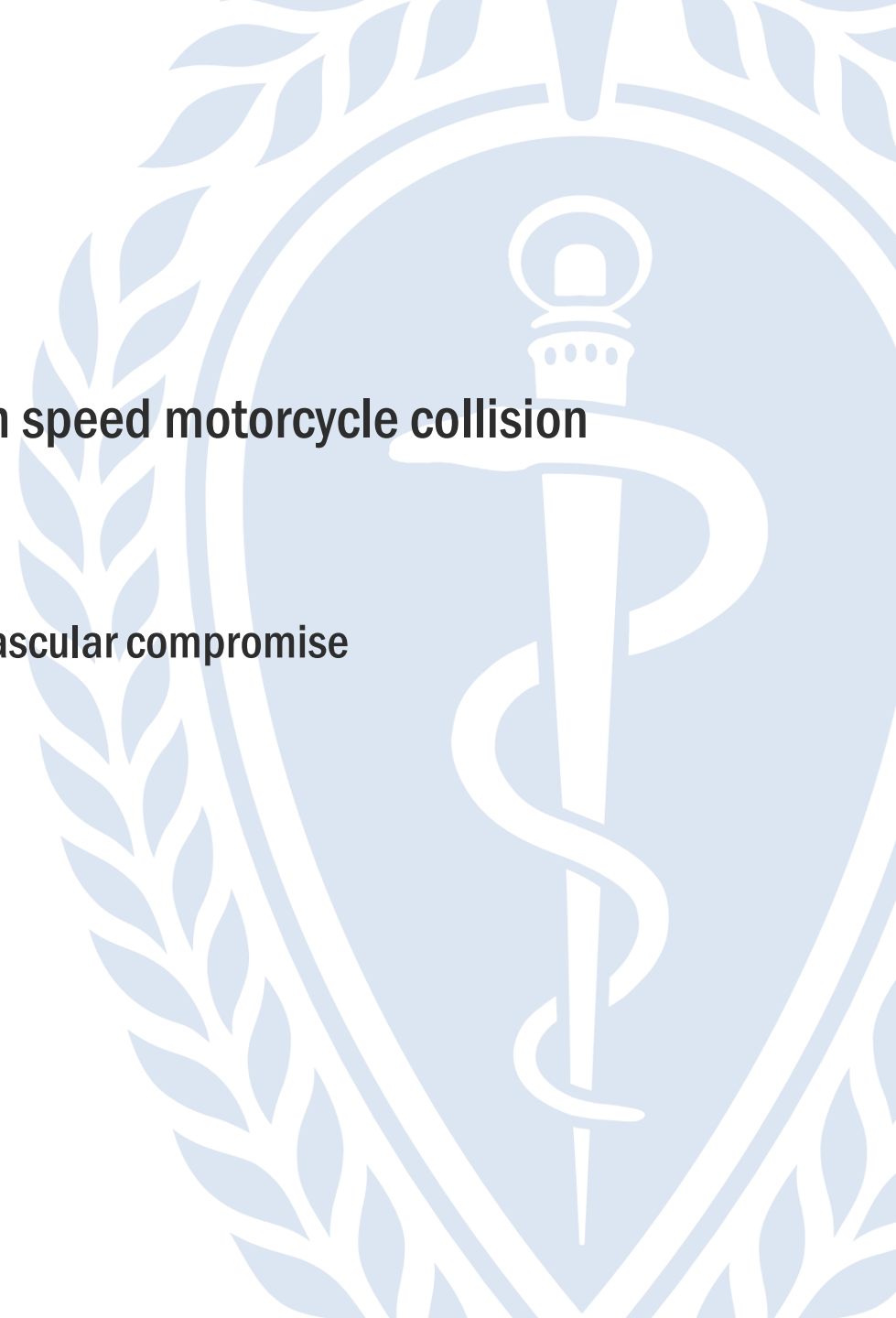
- Blunt force traumatic injuries to the aortic arch and great vessels are relatively rare but are often fatal. (1)
- They can present as a particular surgical challenge.
- We present an unusual case of a traumatic pseudoaneurysm of the innominate artery, outline the options for repair, and discuss the technicalities of the operation in conjunction with intraoperative images.

1) Karmy-Jones R, DuBose R, King S. Traumatic rupture of the innominate artery. *Eur J Cardiothorac Surg* 2003; 23: 782-7



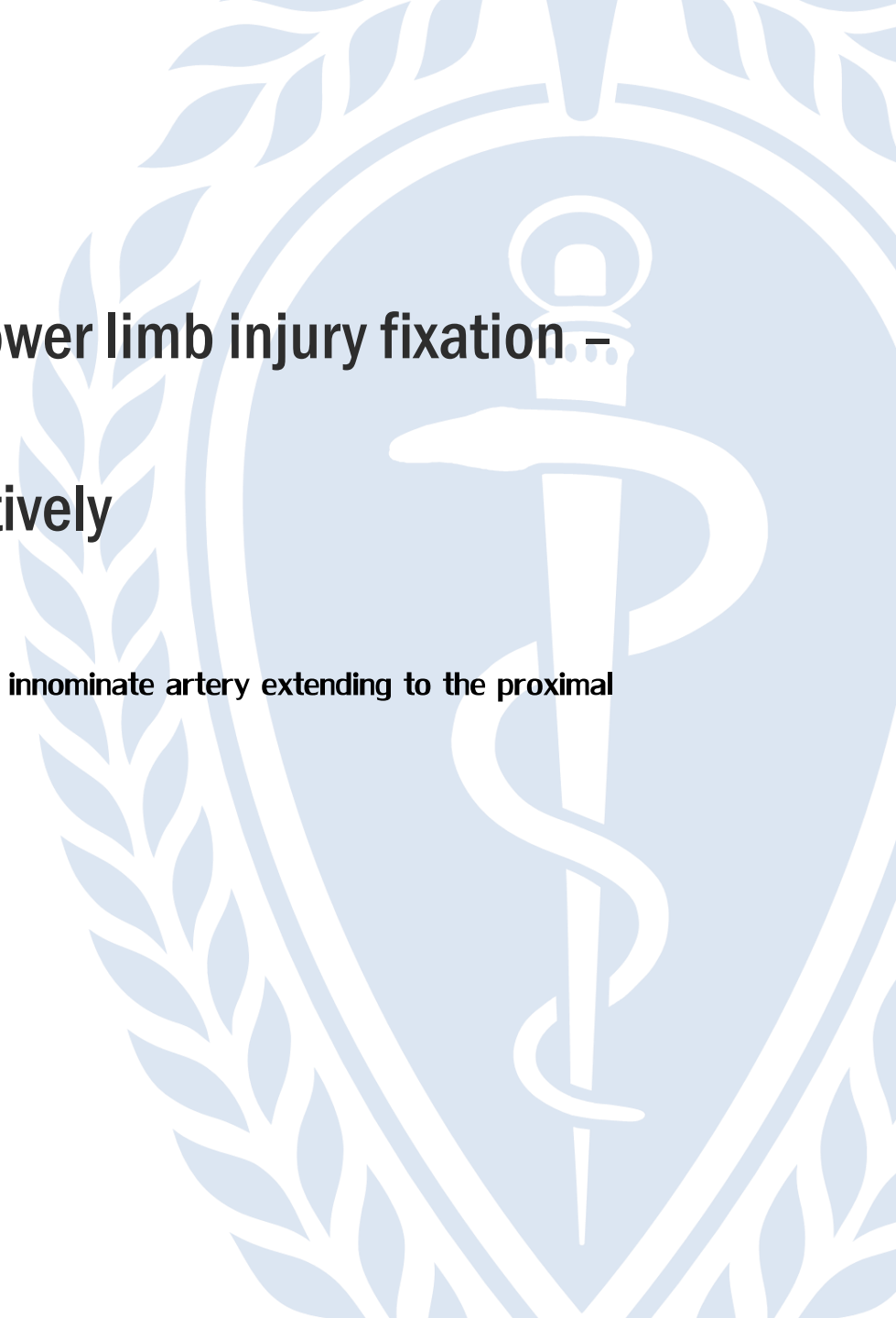
The patient

- 17-year-old male
- Taken to district hospital by ambulance following high speed motorcycle collision
- Initial injuries identified on CT at presentation:
 - Right radial/ulna fracture with deformity
 - Right open tibia/fibula fracture with deformity and neurovascular compromise
 - T4 and T5 vertebral body fractures
 - Craniofacial fractures involving external auditory canal
 - Lung contusions

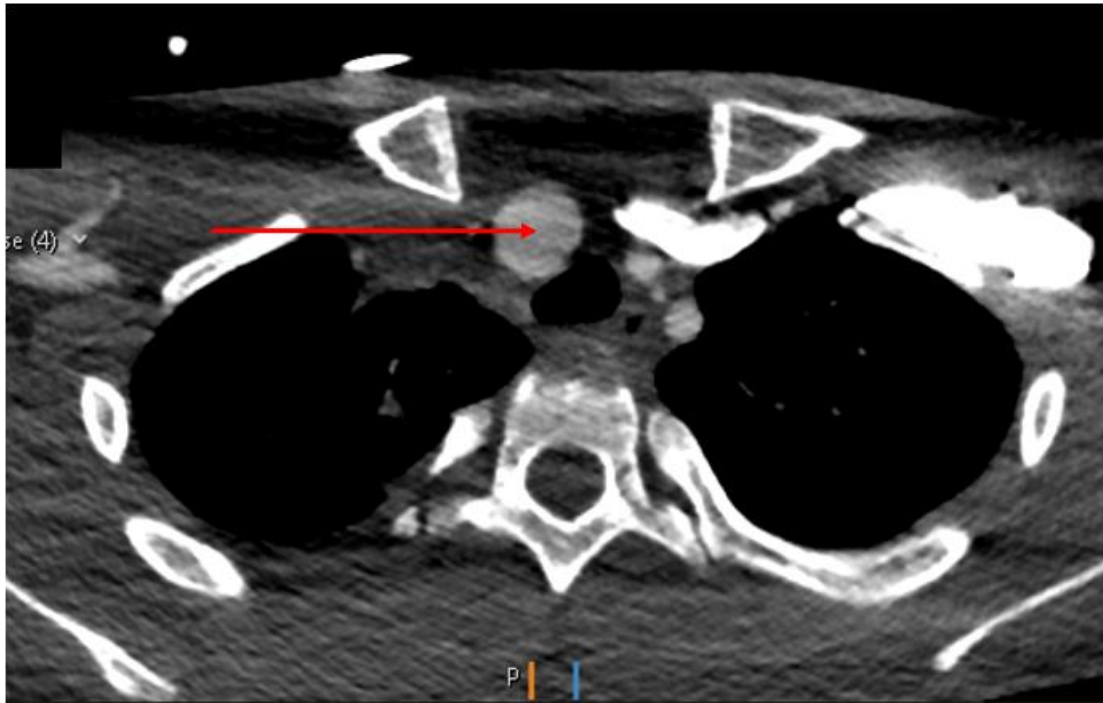


Initial management

- Transferred to our tertiary trauma center for lower limb injury fixation – vascular supply to foot restored successfully.
- Repeat CT angiogram whole body post-operatively
- New injury identified:
 - 23 x 15 x 7 mm pseudoaneurysm arising from the anterior surface of his innominate artery extending to the proximal right common carotid artery.
 - **Expanding** when compared retrospectively to original trauma CT



CT imaging



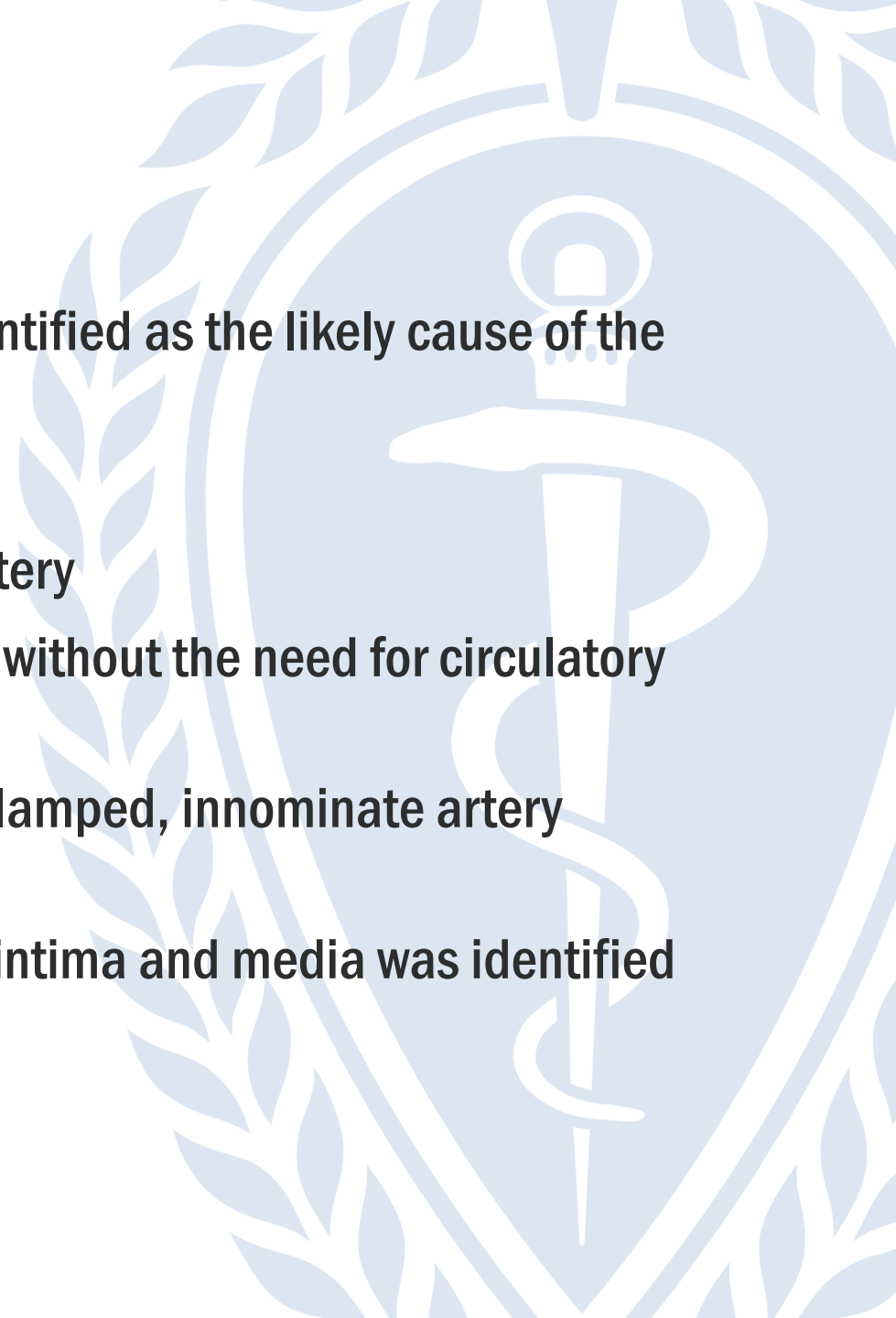
Surgical plan

- *Ad hoc* MDT held
- Endovascular vs. open surgical options considered
- Literature on the subject is limited but 2023 review advocates open repair in unstable patients or those with rapidly expanding hematoma, or endovascular repair in stable and elective cases. (2)
- Given possible arch involvement, the consensus was for emergency open repair +/- aortic arch replacement under deep hypothermic circulatory arrest

(2) Bishop MA, Akbani MJ. Innominate artery injury. (Updated 2023 Jul 25). In: StatPearls (Internet). Treasure Island (FL). StatPearls Publishing;2024.

Operating room

- A total right sternoclavicular joint dislocation was identified as the likely cause of the underlying vascular injury.
- Frank haemopericardium
- Bruising to distal ascending aorta and innominate artery
- Decision made to repair on cardiopulmonary bypass, without the need for circulatory arrest
- Right common carotid and right subclavian arteries clamped, innominate artery controlled with side biting clamp.
- On opening the adventitia, a complete rupture of the intima and media was identified

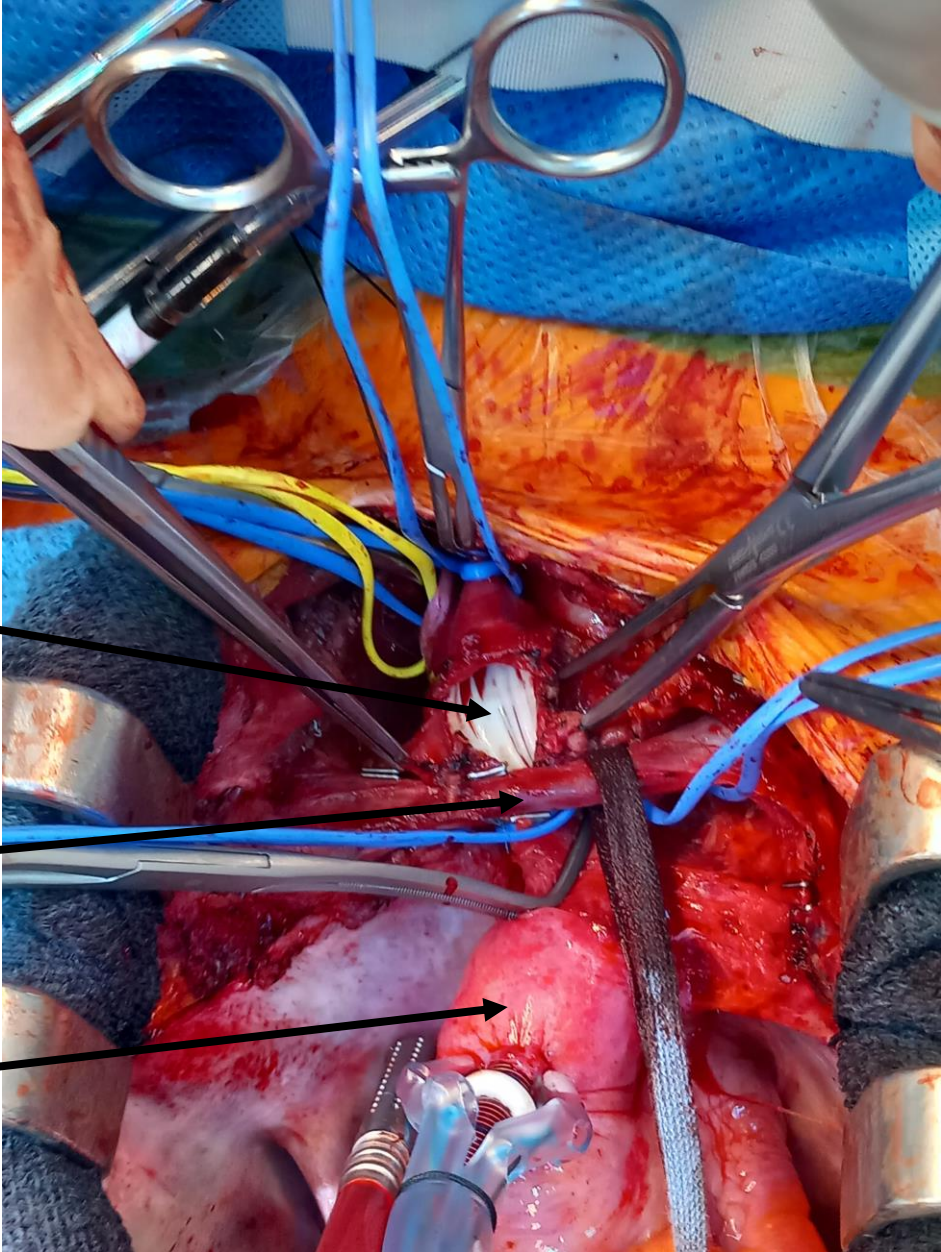


The injury

Ruptured innominate artery

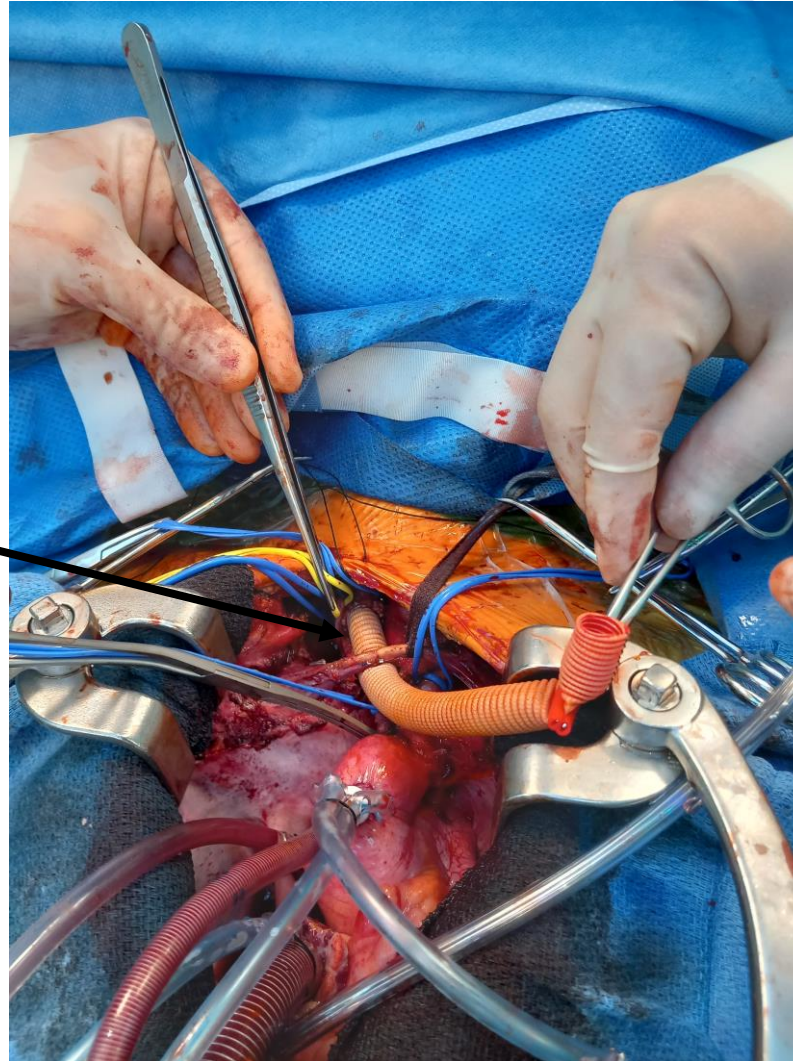
Innominate vein (taped)

Aorta and cannula

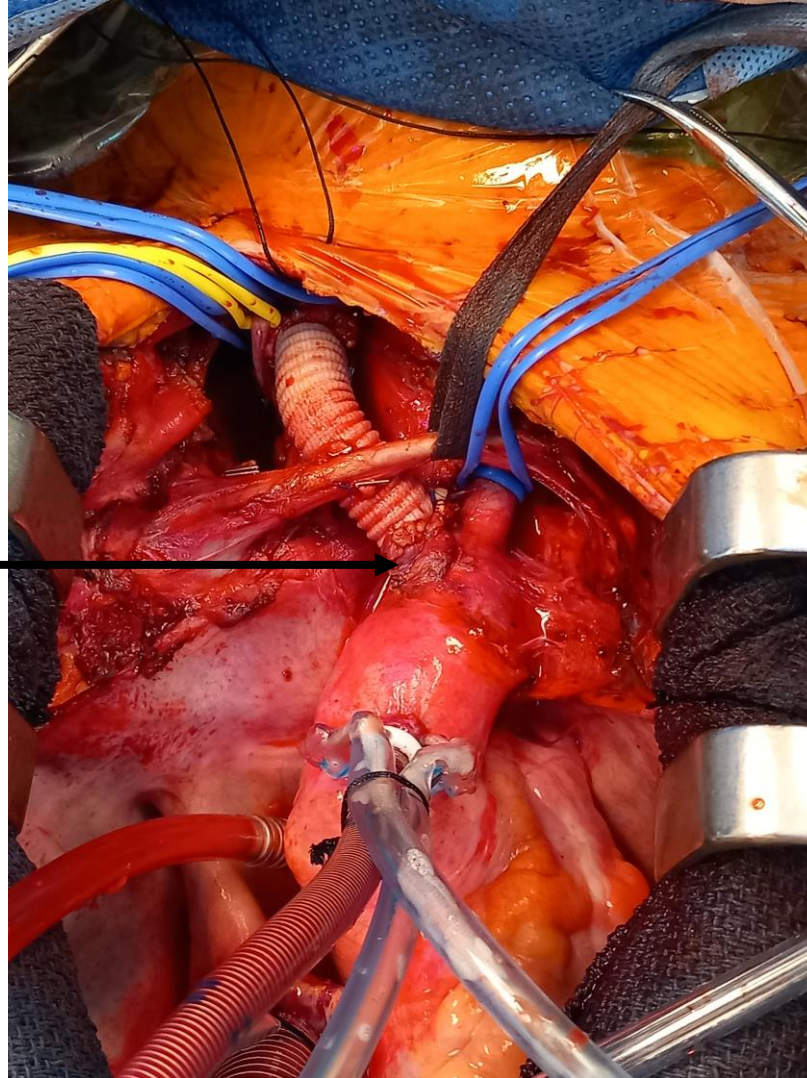


Repair with 10 mm vascular graft

Distal anastomosis first



Repair with 10 mm vascular graft



Then proximal anastomosis

Cerebral saturations stable throughout

Recovery

- Neurologically intact
- Other orthopedic and maxillofacial injuries treated
- Discharged home 16 days later to complete rehabilitation



Conclusions

- **Innominate artery trauma is a rare presentation, but can occur in high velocity blunt trauma leading to sternoclavicular joint dislocation.**
- **Injuries that may involve the arch warrant open repair.**
- **This case, along with radiological and intraoperative imaging, illustrates the decision making and surgical skills necessary for an aortovascular surgeon to manage such patients.**

