Complications of REBOA when performed by inexperienced operators – what can be done to avoid the problem

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Disclosures

• None
• I was a trauma surgeon before I was a vascular surgeon.

Why REBOA?

• Majority of preventable deaths on battlefield from truncal & junctional hemorrhage

Vascular surgeons as pioneers, patriots

“Necessity is the mother of invention”

Jonathan Eliason	Todd Rasmussen
Charles Fox	Joseph DuBose

REBOA complications

• Only 5% in the literature
• Under-reported

• Performed mostly by trauma surgeons
  – ER physician use is increasingly
  – Lack of experience can result in major errors

• Complications can happen at every step
REBOA malposition

- Ascending aorta
- Internal iliac
- Left carotid
- Left subclavian

Iliac artery rupture

Leg ischemia leading to amputation

Other complications

- Poor location of access
  - SFA, EIA, venous
- Thrombosis
- Embolism
- Iliac dissection
- Aortic rupture
- Prolonged visceral and renal ischemia
- Balloon migration

Prolonged ischemia

- REBOA in aorta for 12 hours
  - > Aorta, iliac thrombosis
  - > Severe pelvic & lower extremity ischemia
  - > Death
- Shocking example of inexperience

How can complications be avoided?

- Training & practice
- X-ray confirmation (misplacement is common)
- REBOA needs to go directly to OR
- Slow balloon deflation to prevent CV collapse
- Teamwork!
Recommendation #1

- Protocols
  - Femoral arterial line in all hypotensive trauma patients
  - It’s all about access!
  - Can quickly upsize to 7 Fr sheath

Recommendation #2

- Team approach to REBOA
  - Trauma surgeons have less open vascular or endovascular experience than in the past.

- Vascular surgeon involvement in 100% of cases after placement
  - REBOA placement should trigger an automatic vascular surgery consultation
  - Post-REBOA bilateral ABIs

Recommendation #3

- Vascular surgeons need to take a leadership role
  - learn and teach REBOA (like military vascular surgeons)
  - help hospitals determine credentialing
  - evaluate all REBOA complications

Conclusion

- REBOA complications are common, and will become more common as it is more widely used by inexperienced providers

- Vascular surgeons need to take a leadership role in REBOA

- Trauma is a team sport
  - no one can do everything anymore, involve specialists

REBOA Steps

1. Arterial access
2. Balloon positioning
3. Balloon inflation
4. Management during inflation
5. Balloon deflation
6. Sheath removal