Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)

Patients in shock due to hemorrhage below the diaphragm are potential candidates for REBOA as a bridge to definitive hemorrhage control.

Contraindications:
- Suspicion for intrathoracic hemorrhage
- Hypotension or cardiac arrest not due to hemorrhage
- Caution in non-adult patients

Insertion:
- Place a 4 Fr micropuncture line in all patients requiring femoral access for arterial monitoring
- Place a 7 Fr sheath if REBOA is imminent
- Follow the steps in the attached reference guide for REBOA placement
- Place REBOA in Zone 1 for suspected abdominal or retroperitoneal hemorrhage (sternal notch or approximately 46 cm, inflate with 8ml initially and assess for response)
- Place REBOA in Zone 3 for suspected pelvic, junctional, or proximal lower extremity hemorrhage (xiphoid process or approximately 28 cm, inflate with 2 ml initially and assess for response)
- Consider an abdominal x-ray to verify placement

Management:
- After placement, immediately plan definitive hemorrhage control, ideally within 15 minutes for Zone 1 placement, with a goal total occlusion time of less than 30 minutes
- Move from Zone 1 to Zone 3 once abdominal bleeding isolated to pelvis
- Deflate the balloon as soon as possible once hemorrhage control is achieved
- Remove the catheter and sheath as soon as possible. Hold point pressure for at least 30 minutes and maintain bedrest for six hours following removal of 7Fr sheath.
- Hourly neurovascular checks hourly to the lower extremity should begin at sheath insertion and continue for 24 hours following sheath removal.

Complications:
- Total Zone I occlusion time >30 minutes may lead to spinal cord injury
- Over-inflation of the balloon may lead to rupture
- Iliac rupture may occur due to unintended inflation in the iliac artery
- Ischemic injuries due to prolonged occlusion time may result in organ failure and death
- Access complications may occur such as: arterial disruption, dissection, pseudoaneurysms, hematoma, thromboemboli, and extremity ischemia
- Aortoiliac injuries may occur including: intimal tear, dissection, thrombosis, or rupture
Aortic Zone I
Left subclavian to celiac trunk

Aortic Zone II
Celiac trunk to lowest renal artery

Aortic Zone III
Lowest renal artery to aortic bifurcation

Source: Ernest E. Moore, David V. Fucikova,
Kenneth L. Mattox: Trauma, Eighth Edition
www.AccessSurgery.com
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References


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1. Measure

- Placement depth1,2,3,4,5,6
  - Zone 1: ~46 cm
  - Zone 3: ~28 cm

2. Empty

- Deflate balloon
  - Ensure balloon is fully deflated
  - Hold vacuum for 5 seconds and close stopcock

3. Flush

- Attach & flush arterial line
  - Use standard techniques
  - Ensure all air is purged

4. Insert

- Insert peel-away into valve
  - Approximately 5 mm

- Deflate slowly
  - Prepare team for potential rebound hypotension

5. Inflate1,2,3,4,5,6

- Inflation Volume
  - Zone 1: Start with 8 cc
  - Zone 3: Start with 2 cc

- “Start 2, Start 8, Don’t Overinflate.”
  - Start small, then check

6. Secure

- Secure Catheter close to the introducer sheath

- Check for full and equal pulse in each leg using your standard technique

Caution

- Fully deflate balloon
  - Hold vacuum for 5 seconds and close stopcock
  - Corkscrew twist the catheter to facilitate removal
  - If necessary, remove catheter and introducer sheath as a unit

Provide Definitive Treatment

- Provide definitive hemorrhage control
  - The clock is ticking!
  - Move quickly to definitive control

Deflate

- Fully deflate balloon
  - Hold vacuum for 5 seconds and close stopcock
  - Corkscrew twist the catheter to facilitate removal
  - If necessary, remove catheter and introducer sheath as a unit

Remove

- Fully deflate balloon
  - Hold vacuum for 5 seconds and close stopcock
  - Corkscrew twist the catheter to facilitate removal
  - If necessary, remove catheter and introducer sheath as a unit

- Check for full and equal pulse in each leg using your standard technique

Change in Systolic Blood Pressure

Inflation Volume

Zone 1: Start with 8 cc
Zone 3: Start with 2 cc