Automated Femoral Artery Cannulation Device

Rajabrata Sarkar, M.D. Ph.D
John Raza Ph.D.
Jay Renner B.S.
Gilmer Blankenship, Ph.D.

Division of Vascular Surgery University of Maryland Baltimore
Department of Electrical Engineering, University of Maryland College Park

REBOA: Resuscitative Endovascular Balloon Occlusion of Aorta

REBOA Issues
- Earlier application in the critically injured patient is better
- All REBOA requires stable femoral artery sheath access (12 Fr – 7Fr)
- Field REBOA was done with intensivist at roadside accident scene
- Who will be at the scene to put REBOA in?
- Military: Medic/Corpsman
- Civilian: EMT/Paramedic
- Vascular/Trauma doctor?
- Femoral access in an ambulance?
- Femoral access on the battlefield?

Purpose
- Create self-contained automated femoral artery access device for non-physician use
- Prep area with antiseptic solution
- Localize artery (often pulseless)
- Anesthetize
- Puncture and cannulate artery accurately
- Nick skin with scalpel
- Advance dilator/sheath
- Remove wire/needle/dilator
- Confirm arterial placement
- Flush with heparin saline

Disclosures
- None
Purpose

- Utilize automation and sensing technology to substitute for physician experience in:
  - Arterial localization
  - Accurate puncture
  - Arterial cannulation
  - Confirmation of sheath placement

Automated Arterial Cannulation Tool

Prototype Design and Function

Automated Insertion Device

Next Steps

- Coordinate motors driving needle/wire/sheath/dilator
- Add motors for anesthetic/scalpel, etc.
- Refine proprietary technology to confirm arterial cannulation and intra-arterial sheath placement
- Separate prototype into a disposable component (meds + sheath parts) that docks into a rechargeable driver handle (motors/Doppler/computer)

Next Steps

- Complete fully actuated prototype device
- Animal trials
- FDA Meetings
- Clinical trials
- Refine product
- Develop and manufacture
Potential Uses

- REBOA (military and civilian)
- Emergent cardiac catheterization for STEMI:
  - Femoral sheath preplaced by nurse or tech
  - Reduce door to balloon times?
- ER and ICU for hypotension:
  - Radial artery access not always possible
  - Rapid access for BP monitoring to guide pressors
- Intra-aortic Balloon pump

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