Blood Pressure Manipulation During TEVAR is Critical for TBAD Repair

Disclosures
- Paid Consultant- Cook Medical (Proctor, Complex Case Reviews)
- Paid Consultant – Medtronic (Physician Screening Chairman, MonaLSA Feasibility Trial)
- Some slides describe off-label use of commercially available products, and others describe non-approved devices available only under IDE or compassionate use with FDA approval in the U.S.

TEVAR for Uncomplicated Aortic Dissection
- Instead Trial- Could earlier treatment with TEVAR improve outcomes in CTBAD (2-52 weeks)
- No Impact on Survival at 2 years, although more FL thrombosis and Aortic remodeling did occur.
- 20% cross-over rate from medical therapy to TEVAR
- Instead XL

TEVAR for Complicated TBAD
- Malperfusion
- Rupture

Endovascular Objective
- Cover proximal entry tear
- Expand dissected true lumen
- Promote false lumen thrombosis

Instead XL
- Aortic Remodeling 79% pts TEVAR vs 10% medical group
- All-cause mortality curves crossed at 3 years and although there was no significant difference at 5 years, trend suggests all-cause mortality was less in the TEVAR group
- Aortic-related deaths – TEVAR significantly less than medical treatment
Timing

- Hyper Acute: Within 24 hours
- Acute: 1-14 days
- Sub-Acute: 15-90 days
- Chronic: >90 days

Peri-procedural Hemodynamic Management

- Preop- beta blockers or Clonidine should be continued because of potential rebound of HR and BP
- Avoid diuretics on day of surgery
- ACE and ARB should ideally be held two days before elective TEVAR, they can precipitate vasoplegia (low SVR, high CO) and difficult to treat hypotension
- Multidisciplinary Care in IMPORTANT

Meticulous BP Control during TEVAR

- Allows safe positioning of the T-stent graft
- During deployment- hypotensive and bradycardic
- After deployment- BP to prevent SCI
- IV short-acting antihypertensive management is preferred

Avoiding Disaster

Are things different now?

- Approval of second and third generation TEVAR devices for Dissection indication.
- Trials with Side Branch devices include indication for Dissection
TEVAR deployment

- Objective: Minimize cardiac output
- Permissive hypotension
- Adenosine
- Right Atrial Inflow Occlusion
- Rapid Pacing

Adenosine

- 1 mg/kg results in immediate 20-30 s of asystole.
- Can be unpredictable

Rapid Pacing

- Temporary venous pacing electrode via jugular or femoral vein.
- Mechanism is loss of atrio-ventricular synchrony and reduction of ventricular filling time, results in decreased left ventricular preload, stroke volume, and cardiac output.
- 130–180 bpm can lower BP to 50-60 mm Hg
- 160-200 bpm can lower BP to 20-30 mm Hg
- Remember to have defibrillator pads on
- Advantage – Controllable and Repeatable

Right Atrial Inflow Occlusion

- Compliant Occlusion Balloon
- Jugular or Femoral Vein Access
- Inflate in right atrium
- Reduce Cardiac Preload
- Disadvantages: Balloon Rupture or Migration
- Intracranial Venous Hypertension if SVC occluded

After TEVAR deployment

- Fine line between of Hypertension that can exacerbate Aortic Dissection and Spinal Cord Ischemia.
- Hypotension- Catecholemines or Vasopressin
- Vasopressin increases SBP without increasing Heart Rate- Advantage in patients with CAD
Conclusions

- Multidisciplinary Care of BP is paramount
- Anesthesia, Surgical Team, Intensivists all need to be on the same page for pre, peri, and post op care.
- Rehearse the deployment before actual deployment.

Communication is the key with Anesthesia and ICU and Surgical Team

Thank you!
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