STENT GRAFTS for RUPTURED AAA

Anaesthesia rounds

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S Gagne

R L Garnett

Ottawa Civic Hospital

IMPETUS

- Endovascular repair of ruptured aortic aneurysms: Resch T et al; J Endovasc ther. 2003 June: Sweden
- 21 patients/5 years; 19% mortality
- Less blood loss, ICU time vs open cases
- Local cutdown or percutaneous puncture, balloon occlusion

Impetus 11

- Pamler Reinhard: Germany
- 24 patients 6 years; mortality 12.5% vs 45%
- Minimal resuscitation as long as BP>50; awake patient; no balloon occlusion, maintain abdominal muscle tension tamponade
- Less complications; standard of care

IMPETUS 11

- Stable patient; CT Scan: measurements
- Unstable or shock to OR; GA etc
- Stable: OR: local exploration of both femorals; IV narcotics and sedation
- Epidural if possible
- GA if need be; anaes choice
- Patients very stable: PACU, ward

Surgical procedure

1) Local anaesthesia, expose left femoral artery
2) Insert guidewire under fluoroscopy to thoracic aorta
3) Insert catheter over wire
4) Insert superstiff wire and exchange for balloon catheter
5) Inflate balloon at celiac artery to control aorta
6) Insert second wire and pigtail catheter up left femoral artery

Surgical procedure

7) Expose right femoral artery
8) Pass a second guide wire, catheter and superstiff wire to the balloon area
9) Pass a aortoiliac stent graft to the level of the renal arteries
10) Angiogram to identify and mark the renals; need apnea

Surgery

11) Deflate and pull back the balloon to allow placement and deployment of the proximal end of the stent graft!!!
12) BLEEDING AND HYPOTENSION!
13) Deploy distal end of the stent in the right common iliac artery
14) Remove delivery system

Surgery

15) Insert balloon to balloon the proximal and distal ends of the stent
16) Insert occluder into left common iliac artery
17) Fem-fem graft to perfuse left leg
18) close

Surgery

- Time from start to aortic balloon occlusion likely less than 10 minutes
- This will be the planned approach for both stents and open procedures
- 10-30 minutes for angios & to position stent
- Major bleeding point will be from balloon deflation through stent insertion and ballooning proximal and distal ends

Surgery

- Reperfusion of liver, gut plus continued blood loss: hypotension and acidosis
- Deploy stent, and ballooning; approx 5 minutes;
- Placement of occluder; 5-10 minutes
- Fem-fem graft, closure 45 minutes

Anaesthesia procedure for contained rupture, stable patient

1) Large bore IV
2) IV sedation/narcotics/N-acetyl cystine
3) If possible; Low thoracic-high lumbar epidural insertion to block to L1
4) Epidural fentanyl/dilaudid
5) Arterial line
6) Balloon up, epidural local anaesthetic
7) Volume replenishment with pentaspan

Anesthesia

8) May require apnea for angiogram to localize renal arteries for stent placement
9) Ballooning upper and lower ends; BP up & down, watch fluoro screen
10) If no epidural, GA for fem-fem graft
11) PACU: back pain is an issue: PCA

Problems

- Suitable patients; don't need airway control, stable enough for CT
- Room is busy and noisy, sedation
- Wide swings in BP with occluder balloon up and then down for stent placement: must be resuscitated for reperfusion, phenylephrine infusion, pentaspan +/- blood transfusion

Problems 11

- BP up and down for ballooning upper and lower ends
- Placement of occluder in left iliac
- Fem-fem graft in patient with no epidural; need GA
- Reperfusion of left leg
- PACU; pain and confusion

Problems 111

- Stent devices are large and stiff
- Iliac arteries may be narrow, fragile and either not passable or can tear
- Watch angio for leak: immediate opening
- May need conduit graft to distal aorta for access i.e opening, clamping, sewing and removal at finish

Finale

- Can it be done?
- Learning curve, surgical plus us
- Balloon occluder makes very good sense, open or stent
- Successful stent will be far less stressful on the patient but probably not so on us
- The next year will be interesting!