

CARDIOVASCULAR SYMPOSIUM THE 13TH

Endovascular Abdominal Aortic Aneurysm Repair

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Anatomy:

- Abdominal aorta begins at diaphragmatic hiatus
- Main branches in abdomen: celiac, superior mesenteric, renals, inferior mesenteric, terminates in common iliac arteries
- Average infrarenal aortic diameter 20 mm (18mm in women)

Aneurysms:

- Abdominal aortic aneurysm most common type
- Aneurysm is when diameter is 1.5 times greater than normal (ie 30 mm for men)
- Risk of rupture based on size – larger the aneurysm higher the risk
- If AAA ruptures, 50% never make it to hospital, 50% never leave

Epidemiology:

- 10% population over 65 years of age have AAAs
- More common in men than women

Pathophysiology (ie cause)

- We do not really know! (a few important facets have been identified)
- Chronic inflammation – more than just atherosclerosis but degenerative changes
- Destruction of elastin
- Proteins called MMPs (metalloproteinases) play a role

Risk Factors for AAA

- Smoking by far the strongest (including former smokers)
- Hypertension, increasing age, high cholesterol
- 15-20% people with a family history
- Medicare allows screening at 1st visit if ever smoker (male only) or family history

Diagnosis

- Physical exam approximately 82% specific if greater than 5cm
- Ultrasound cheap, easy and accurate – 1st test of choice
- CT next step in work-up (U/S does tend to underestimate size of aneurysm)

Treatment

- Smoking cessation and blood pressure control
- No magic pill to control aneurysm expansion, yet
- Repair of aneurysms greater than 5-5.5cm or if grow greater than 1cm/year
- Endovascular repair versus open depends on a number of factors

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Open Repair

- In hospital mortality approximately 5% all comers based on large databases
- Individual high volume centers lower, patient comorbidities also affect outcome
- Most common complication is cardiac (most within 2 days)
- Usually 5-10 day hospital stay
- Importantly, late complications are uncommon – about 7% at 5 years

Endovascular Aneurysm Repair (EVAR)

- Anatomic requirements – neck, angle of neck, thrombus and iliac suitability
- Multiple products on market – Gore, Medtronic, Cook, Endologix, etc
- Placed from a femoral approach – open or percutaneous
- Usually overnight hospital stay
- Endoleak is most common complication, but also include access site complications, migration, kinking of iliac limbs, etc
- Follow CT scans important – 1, 6, 12 months, then yearly if no leak identified

Endoleak

- Definition – persistent blood flow or pressure in excluded sac (four types)
- I – inadequate seal at proximal or distal attachment zone
- II – retrograde flow from lumbar, inferior mesenteric or other collateral vessel
- III – component disconnection, fabric disruption or graft disintegration
- IV – graft wall porosity
- Type II most common with 20% patients having one at completion angiogram
- Treatment depends on type of leak – must fix I and III, can follow II if aneurysm not expanding to see if it spontaneously resolves

EVAR versus Open Repair

What is certain?

- Reduced ICU and hospital stay with EVAR
- Reduced blood transfusion with EVAR
- Reduced recovery time with EVAR
- More post operative complications and diagnostic studies with EVAR

What is uncertain?

- Long term mortality with EVAR versus open especially after 30 days
- Long term durability of endografts

EVAR for Ruptured Aneurysm?

- Initially thought impossible, now very promising in the right patient
- Requires equipment, product and personnel capable of rapid response
- Complications such as abdominal compartment syndrome and endoleak more common

Future directions

- Smaller graft profiles able to handle more challenging anatomy
- Branched endografts (ie grafts with holes for renal and/or visceral arteries, which can then be stented allowing repair of complex juxta or suprarenal aneurysms)