Descending aorta replacement through median sternotomy

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Definition of aneurysm

- Abnormal dilation of blood vessel

- Vessel
- Extent
- Type
  - Fusiform
  - Saccular
  - Dissecting (Aorta)

- Aetiology
Dissecting aortic aneurysm

- Dissection in an aortic aneurysm

- Aortic dissection that has subsequently become aneurysmal
Classification of Thoracoabdominal aneurysms 1Crawford
Classification of Thoracoabdominal aneurysms 2a DeBakey
Classification of Thoracoabdominal aneurysms 2b Stanford / Daily
Aetiology (Pathophysiology)

✔ Atherosclerotic 90%
✔ Mycotic or trauma 9%
  – Marfans,
  – Ehlers – Danlos,
  – Homocysteineuria,
  – Cystic medial necrosis

Presentation
✔ Incidental on CXR
✔ Workup for other condition
Investigations

✓ Hx
✓ Examination
✓ Cardiac evaluation
  – ECG,
  – Not exercise test,
  – Angiography? CABG pre aneurysm
✓ Aneurysm evaluation,
  – Echo (TOE),
  – CT,
  – MRI,
  – ? Aortography
Investigations

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MR
ECHO (TOE)

2D
Indications for operation

Symptomatic
Acute enlargement
Diameter twice normal aorta

Mortality
Elective 5 to 20 %
Emergency 20 to 60 %

Morbidity
Paraplegia 4%
Different operative approaches

✓ Left incision (if exclude elephant trunk 1st step)
✓ Distal perfusion
  – Cross clamp no circulatory support
  – Gott shunt
  – Partial CPB LA – Fem artery
  – Total CPB DHCA
✓ Spinal cord protection
  – Reimplant intercostals T8 to L1
  – Cross clamp less than 30 minutes
  – CSF drainage
    • Probably depends on the pathology and anatomy
✓ Team effort
Complications

✔ Intraoperatively
  – Bleeding
  – Tissues falling apart
  – Left and right ventricular failure

✔ Postoperatively
  – Bleeding
  – Paraplegia
  – Organ ischaemia
  – Renal failure
CSF drainage

- Early paraplegia
- Late paraplegia
- Post operatively
- Bleeding
- Urine output
- Gases
  - analgesia,
  - dilators,
  - bronchoscopy
- BP management
- Neurological
Case Presentation –
History of Present Illness

A 66-year-old man, known to have dysphagia, breathless perid, chest pain, fatigue.

An ultrasound performed to evaluate this revealed a massive aortic thoracic aneurysm, prompting a referral to our Institution.

Past Medical History – positive for HTA
Case Presentation – Physical Exam

✓ Dyspnea, orthopnea:
  – HTA, tachycardia
  – Aulscutation- left side no breathing
  – Inferior extremities colder with pulses filiforme
  – Exrtremly oedema of the upper extremitas – Sy vena cava superior
  – Intermitent concesses
Case Presentation

All laboratory parameters such as
✓ Serum electrolytes
✓ Coagulation panel
✓ Complete blood cell count
✓ C-reactive protein
✓ Thyroid function tests
✓ Liver enzymes – increased
Echocardiography

✔ Four chambered anatomy with normally related great arteries, and no intracardiac echodensity consistent with rhabdomyoma were seen.

✔ The ascending aorta and the transverse aortic arch were unremarkable.
Echocardiography

The distal thoracic and the proximal abdominal aorta, just below the diaphragm, exhibited multiple areas of irregular fusiform dilation.
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Clinical Course

- Upon admission, the patient was started on atenolol to decrease the blood pressure and minimize the risk of spontaneous rupture of the aneurysm.
- He was intubated due to Sy vena cava superior, with development of somnolentio up to not so deep comma.

- Surgery was performed through median sternotomy, employing right subclavian artery and right femoral artery for arterial inflow, right atrium for venous cannulation. Complete graft replacement of descending thoracic aorta was performed, cross-clamping proximally between left common carotid and left subclavian artery and distally on the terminal part of thoracic aorta, employing mild hypothermia with antegrade and retrograde arterial perfusion. Proximal anastomosis was performed adjacent with left subclavian artery, while the distal anastomosis was performed with true and false lumen, after resection of dissection membrane as far as possible distally, since the left renal artery originated out of false lumen.
Clinical Course

✔ The patient had long time respiratory dependancy due to comma, 7th postoperative day he got tracheostoma
✔ He was awake after 10 days.
✔ Mobilisation and intensive rehabilitation was started.
✔ 21st postoperative day intensive rectorhagia. Rectoscopy showed infiltrative changes of the distal part of sigma.
Clinical Course

- The CT angiogram showed reformation of the thoracic part of the aneurysm
Conclusion

✓ Median sternotomy is feasible in repair of DAA. It provides good exposure of the thoracic aorta with optimal position for proximal and distal aortic clamping, and it is better tolerated by patients regarding postoperative recovery.
Questions?