Renovascular Hypertension And Mid-Aortic Syndrome: There Is A Role For Endovascular As Well As Open Treatments: Which Treatment Is Best At What Ages

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Disclosures

- UK member International Steering Committee Voyager-PAD Trial (Bayer)

Choice of intervention in MAS is dependent on:

- Age
- Access to paediatric endovascular expertise
- Available durable arterial conduit
- Clinical effectiveness

Differential Growth and Development of the Upper and Lower Human Thorax

Middle Aortic Syndrome

Planning Treatment by Disease Pattern

Aortic and renal angioplasty
Primary renal angioplasty

Visceral stenosis rarely significant

Aortic stenosis: is it always significant?

Durable prosthetic conduits become available
Definitive open surgical repair from this age on

Trunk growth almost complete by 10 to 12 years
Only 25% of children have reduced or absent femoral pulses

Only 10% of children have claudication

Aortic stenosis is not haemodynamically significant in the majority of children with Middle Aortic Syndrome

• Collateralisation

Aortic stenosis is not haemodynamically significant in the majority of children with Middle Aortic Syndrome

• Revascularisation strategy must focus primarily on the aortic stenosis (pull through pressures)

Can the aortic stenosis in the 75% be ignored?

Papers from 1953 to 2014: 184 studies

Mid Aortic Syndrome in 3 Month Old Boy

• Now 4 years old
• 4 angioplasties
• Aorta has remodelled
• Hypertension cured

3 months

4 years


EVIDENCE for the Endovascular Approach

Papers from 1953 to 2014: 184 studies

Aortic Stenosis/Coarctation

• However be highly selective in use of aortic stents in children
• Significant in stent restenosis
• Balloon expandable stents

2
159 children undergoing angioplasty +/- stent for renovascular hypertension in the endovascular era

1 death from delayed renal angioplasty rupture

- Consensus in 3 major paediatric centres that angioplasty is:
  - Safe & can be curative
  - Effective in temporising strategy for eventual definitive surgery

Conclusions from these 3 papers

- "We favour ... using percutaneous techniques"
- "... with the goal of allowing growth of an age and size more amenable to definitive corrective surgery"
- "The importance of operator experience cannot be overstated"
- PTA is a worthwhile initial intervention
  - In centres with expertise, experience and equipment
  - Low complication rate – favourable side effect profile
  - Curative in 36%, improves BP control in 32% (> 1 year)
  - Rarely curative in MAS in the London experience

In MAS which Treatment Is Best At What Ages: Summary

Revascularisation strategy must focus primarily on the aortic stenosis (pad through pressure)

- Where there is a significant aortic pressure gradient, treat both the aortic and renal stenoses
  - Open surgical revascularisation preferred

HÖVER

- Interval angioplasty with delayed open revascularisation in infants and young children < 10 years

- Insufficient aortic pressure gradient: facilitate primary renal revascularisation
  - Endovascular revascularisation preferred
  - In children over 10 to 12, open surgical revascularisation preferred
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William Marsden founder of the Royal Free Hospital