Minimally invasive FET

Prof. Dr med. Malakh Shrestha
Vice Chairman & Director of Aortic Surgery
Div. of Cardio-thoracic, Transplantation and Vascular Surgery
Hannover Medical School
Disclosures

- None regarding for this presentation.
Minimally invasive FET Implantation

Minimally invasive Total Arch replacement:

1. Reduction of Invasiveness/ Trauma:
   - Reduction/ absence of Circulatory arrest: arch debranching f
   - Cardiac/ organ Ischaemia: “Beating heart” arch surgery

2. Reduction of surgical trauma through minimally access (Upper hemi- sternotomy access)
Minimize Cerebral Trauma:

Minimize Cerebral ischaemia time: “Supra-aortic branches first“.

Branch-first aortic arch replacement with no circulatory arrest or deep hypothermia.
Matalanis G, Koirala RS, Shi WY, Hayward PA, McCall PR.
Do not leave the heart arrested. Non-cardioplegic continuous myocardial perfusion during complex aortic arch repair improves cardiac outcome

Andreas Martens*, Nurbol Koigeldiyev, Erik Beckmann, Felix Fleissner, Tim Kaufeld, Heike Krueger, Detlev Stanelle, Jakob Puntigam, Axel Haverich and Malakh Shrestha

Clinic for Cardio-Thoracic, Transplantation and Vascular Surgery, Hannover Medical School, Hannover, Germany

10/2010 – 10/2014, 144 patients

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<th>CMP</th>
<th>CA</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Total operation time (min)</td>
<td>363 ± 61</td>
<td>395 ± 87</td>
<td>0.0016</td>
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<td>Cardiopulmonary bypass time (min)</td>
<td>242 ± 50</td>
<td>264 ± 68</td>
<td>0.046</td>
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<td>Cardiac ischaemia time (min)</td>
<td>49 ± 32</td>
<td>149 ± 56</td>
<td>&lt;0.0001</td>
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<td>Visceral ischaemia time (min)</td>
<td>55 ± 20</td>
<td>54 ± 31</td>
<td>0.847</td>
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<td>Minimal esophageal temperature (°C)</td>
<td>25 ± 1</td>
<td>25 ± 2</td>
<td>0.491</td>
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<td>Selective antegrade cerebral perfusion time (min)</td>
<td>101 ± 29</td>
<td>101 ± 43</td>
<td>0.967</td>
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<td>30-day mortality (n, %)</td>
<td>2 (6%)</td>
<td>23 (21%)</td>
<td>0.040</td>
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<td>New onset PND (n, %)</td>
<td>3 (8%)</td>
<td>11 (10%)</td>
<td>1.000</td>
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<tr>
<td>SCI (n, %)</td>
<td>2 (6%)</td>
<td>5 (5%)</td>
<td>0.670</td>
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<td>Recurrent nerve palsy (n, %)</td>
<td>5 (14%)</td>
<td>14 (13%)</td>
<td>1.000</td>
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<td>Myocardial infarction (MI) (n, %)</td>
<td>0 (0%)</td>
<td>3 (3%)</td>
<td>0.573</td>
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<tr>
<td>Low cardiac output (n, %)</td>
<td>1 (3%)</td>
<td>24 (22%)</td>
<td>0.0052</td>
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Upper hemi-sternotomy for thoracic aortic surgery

**Advantages:**
1. Ideal for concomitant arch replacement
2. Central cannulation for CPB
3. Surgical view adequate
4. Better post-op breathing in COPD

**Disadvantages:**
1. Cosmesis better in lower hemisternotomy
2. Concomitant procedure not possible on heart
Surgical Access

The ascending aorta/heart is exposed via an upper mini-sternotomy (up to the 3rd intercostal space). The ascending aorta and either the right femoral vein or the right atrium is cannulated and the patient is put on ECC.
Practical Tip: Study the Pre-op CT Scan carefully!!!
Take home message

Involve the junior colleagues right from the beginning.

....but the mentor has to be present in the OR!
Conclusion

• “Beating Heart” Technique reduces Cardiac Ischaemia time

• “Branch First” technique reduces Cerebral ischaemia time

• Our results show that minimally access thoracic aortic replacement can be performed safely.

• The key to success is a step by step technique to more demanding total aortic arch replacements.

• Meticulous hemostasis & attention to surgical details are of utmost importance to prevent peri-operative complications.
Sir Edmund Hillary: It's not the mountains we conquer, but ourselves!