Pulmonary Artery Banding (PAB): A retrospective review and 10-year experience at a large South African Tertiary Care Centre

Phophi Raphulu
Paediatric Cardiology Fellow
Chris Hani Baragwanath Academic Hospital
University of the Witwatersrand
SAHA 2018
Chris Hani Baragwanath Academic Hospital

- Third largest hospital in the world with approximately 3,200 beds for patients
- Located in the Soweto area of Johannesburg
- Provides medical care to more than 2,000 patients everyday
Introduction

- Pulmonary artery banding (PAB) was first introduced in 1952
- Muller and Dammann
- Neonates and infants with excessive pulmonary blood flow, who are unable to withstand open heart surgery
- Unfavourable anatomy
- Inadequate weight
- LV retraining

Indications for PAB

- Excessive PBF requiring reduction of flow
- LV retraining (TGV)
- Destination
- Preparation for arterial switch
- Staged approach to definitive repair

PAB
Although PAB appears to be a simple procedure, it may be associated with significant morbidity and mortality. Mortality rates of 3 – 25% reported in the literature.


Aim

• To evaluate patients who underwent PAB over a 10 year period at CHBAH; focusing on the indications, outcome, morbidity and mortality.
Materials & Methods

• A retrospective descriptive study was conducted at Chris Hani Baragwanath Academic Hospital (CHBAH)

• To review patients who underwent PAB for the period of January 2007 to December 2017

• Data was extracted from the paediatric cardiology database at CHBAH

• Surgical records

• No exclusion criteria
Results

42 children had PAB (January 2007-December 2017)

Age 1 – 72 months (mean 12.2) | Weight 1.6 -13.8kg (mean 5.6)

Underlying cardiac diagnosis

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSD</td>
<td>55%</td>
<td>23/42</td>
</tr>
<tr>
<td>DORV</td>
<td>16.7%</td>
<td>7/42</td>
</tr>
<tr>
<td>Single ventricle</td>
<td>12%</td>
<td>5/42</td>
</tr>
<tr>
<td>TGV</td>
<td>9.5%</td>
<td>4/42</td>
</tr>
<tr>
<td>AVSD</td>
<td>7%</td>
<td>3/42</td>
</tr>
</tbody>
</table>
In 16/42 (38%) cases, other procedures associated with PAB were performed.

Seven aortic coarctation repairs, three PDA ligations, three atrial septectomies, two Glenn shunts and one SVC ligation were performed with PAB.
Complications

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Procedure-related</th>
<th>ICU-related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underbanding</td>
<td>5/42</td>
<td>5/42</td>
</tr>
<tr>
<td>Band migration</td>
<td>2/42</td>
<td></td>
</tr>
<tr>
<td>Band erosion Into PA</td>
<td>1/42</td>
<td></td>
</tr>
<tr>
<td>Failed PAB</td>
<td>1/42</td>
<td></td>
</tr>
<tr>
<td>Severe TR/RHF</td>
<td>1/42</td>
<td></td>
</tr>
<tr>
<td>Prolonged ventilation</td>
<td>1/42</td>
<td></td>
</tr>
<tr>
<td>Subglottic stenosis</td>
<td>5/42</td>
<td>3/42</td>
</tr>
</tbody>
</table>
Surgery

42 PAB patients

- Destination surgery done in 55% (23/42)
- Awaiting surgery 45% (19/42)

Surgery done

- VSD closure 65% (15/23)
- Glenn shunt 22% (5/23)
- Fontan 4.3% (1/23)
- Rastelli 8.7% (2/23)

*Time between PAB insertion and debanding/destination surgery; median 12.5 months (IQR 9-26)*
Outcome

Overall case fatality rate 19% (8/42)
Cause of Death

- Sepsis: 5/8
- Respiratory failure: 1/8
- Severe TR & RHF: 1/8
- PHT crisis: 1/8
Conclusion

• PAB remains a safe and effective surgical palliative procedure

• Although some patients may have significant morbidity, majority have a good outcome

• Infection control measures and shortened ICU stay may improve outcome
Acknowledgements

- Prof A Cilliers
- Dr H Ntsinjana
- Dr Van Der Donck
- Dr MM Lebea

THANK YOU