Canaux artériels
Passé, présent, futur

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III. ORIGINAL COMMUNICATIONS.

1. ON A CASE OF PATENT DUCTUS ARTERIOSUS, WITH ANEURISM OF THE PULMONARY ARTERY.

By James Foulis, M.D., Edinburgh.

Mr President and Gentlemen,—One morning, early in the year 1882, a young girl came to my consulting-room for advice for the following distressing symptoms:—Great palpitation of the heart on slight exertion; palpitation of the heart when lying down; and no palpitation when standing.

PATENT DUCTUS ARTERIOSUS WITH INFECTIVE PULMONARY ENDARTERITIS.

By Morris Manges, M.D.

New York.

Mrs. R. B., aged 32, housewife, entered Mount Sinai Hospital on October 21, 1915.
Passé
The Patent Ductus Arteriosus
Observations from 412 Surgically Treated Cases

By Robert E. Gross, M.D., and Luther A. Longino, M.D.

LIGATION OF PATENT DUCTUS ARTERIOSUS
IN PREMATURE INFANTS


SUMMARY
Twenty-four neonates, at 25–34 weeks' gestation with a weight range of 570–1530 g underwent ligation of patent ductus arteriosus (PDA). The infants had mild to severe respiratory distress syndrome at birth and later developed signs of heart failure as a result of left-to-right shunting through a PDA. Surgical closure of the PDA was performed within 2–33 days after birth. In the
Transfemoral Plug Closure of Patent Ductus Arteriosus
Experiences in 61 Consecutive Cases Treated Without Thoracotomy

By Kenji Sato, M.D., Masaori Fujino, M.D., Takahiro Koizuka, M.D.,
Yasuki Naito, M.D., Sochiro Kitamura, M.D., SUSEMI Nakano, M.D.,
Choken Ohysa, M.D., and Yasunari Kawashima, M.D.
FIGURE 2. Configuration of the ductus seen angiographically (see text).
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Recommendations for Transcatheter PDA Occlusion

Class I
1. Transcatheter PDA occlusion is indicated for the treatment of a moderate-sized or large PDA with left-to-right shunt that results in any of the following: Congestive heart failure, failure to thrive, pulmonary overcirculation (with or without pulmonary hypertension), or an enlarged left atrium or left ventricle, provided the anatomy and patient size are suitable (Level of Evidence: B).

Class IIa
1. Transcatheter PDA occlusion is reasonable in the presence of a small left-to-right shunt with normal-sized heart chambers when the PDA is audible by standard auscultation techniques (Level of Evidence: C).

Class IIb
1. In rare instances, transcatheter PDA occlusion may be considered in the presence of a bidirectional PDA shunt due to pulmonary hypertension and obstructive pulmonary vascular disease but reversible to pure left-to-right shunting with pulmonary vasodilator therapy (Level of Evidence: C).
2. Transcatheter PDA occlusion may be considered in a PDA associated with a small left-to-right shunt with normal heart size and an inaudible murmur (Level of Evidence: C).

Class III
1. Transcatheter PDA occlusion should not be attempted in a patient with a PDA with severe pulmonary hypertension associated with bidirectional or right-to-left shunting that is unresponsive to pulmonary vasodilator therapy (Level of Evidence: C).
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Original article
Contemporary outcomes of percutaneous closure of patent ductus arteriosus in adolescents and adults
Sudhakar P, John Jose*, Oommen K. George

S. P et al. / Indian Heart Journal 70 (2018) 308–315

Fig. 2. PDA morphological types and devices. Arrows indicate PDA. Top panel shows PDA morphological types based on Krischenko classification. Bottom panel shows the corresponding post-deployment angiographic pictures.
Outcomes of Surgical Ligation after Unsuccessful Pharmacotherapy for Patent Ductus Arteriosus in Neonates Born Extremely Preterm

Dany E. Weisz, MD, MSc, Lucia Mirea, PhD, Maura H. F. Resende, MD, Linh Ly, MD, Paige T. Church, MD, Edmond Kelly, MD, S. Joseph Kim, MD, PhD, Amish Jain, MD, PhD, Patrick J. McNamara, MD, MSc, and Prakesh S. Shah, MD, MSc

The hemodynamic significance of the PDA and date of as-

Treatment for PDA was at the discretion of the attending

We conducted a subcohort analysis of a retrospective cohort

The authors declare no conflicts of interest.
Transcatheter Closure of Hemodynamic Significant Patent Ductus Arteriosus in 32 Premature Infants by Amplatzer Ductal Occluder Additional Size-ADOIIAS

Patrice Morville¹* and Ahmad Akhavi²

Catheterization and Cardiovascular Interventions 90:612–617 (2017)

Fig. 2. Device positioning in lateral fluroscopy.
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Présent: The French Multicenter Data on Trans-catheter PDA closure in Premature infants

- 4 centres
- Données rétrospectives
- Septembre 2013 - Juin 2017
- Enfants prématurés
- Fermeture du PCA par cathétérisme
Results: Demographic data

<table>
<thead>
<tr>
<th>Weight Category</th>
<th>N</th>
<th>GA</th>
<th>BW</th>
<th>Procedural age</th>
<th>Procedural weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2 kg</td>
<td>22</td>
<td>30.3 +/- 4.5</td>
<td>1458 +/- 730</td>
<td>71 +/- 32</td>
<td>2707 +/- 413</td>
</tr>
<tr>
<td>&gt; 1 to 2 kg</td>
<td>59</td>
<td>26.5 +/- 1.3</td>
<td>882 +/- 195</td>
<td>32 +/- 13</td>
<td>1334 +/- 234</td>
</tr>
<tr>
<td>&lt; or =1 kg</td>
<td>21</td>
<td>25.8 +/- 1.4</td>
<td>682 +/- 110</td>
<td>22 +/- 8</td>
<td>880 +/- 105</td>
</tr>
</tbody>
</table>
## Procedural data

<table>
<thead>
<tr>
<th></th>
<th>PDA size</th>
<th>Fluoroscopy minutes</th>
<th>device</th>
<th>Dose mG</th>
<th>complications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>2.9 Pulm 3.2 Ao</td>
<td>6.5 minutes</td>
<td>MVP 10 ADO II AS 91 Coil 1</td>
<td>30 +/- 52</td>
<td>TR 3 Late CoA 1; Mild Ao obstr 1 LPA obstruction 3</td>
</tr>
<tr>
<td><strong>&gt; 2 kg</strong></td>
<td>2.8 Pulm 3.6 Ao</td>
<td>6.9 minutes</td>
<td>MPV 4 ADO II AS 17 (5<em>2, 5</em>4, 5*6) Coil 1 1 sheathless</td>
<td>49 +/- 74</td>
<td>1 failure: too large, spontaneous closure 72h post procedure</td>
</tr>
<tr>
<td><strong>1 à 2 kg</strong></td>
<td>2.8 Pulm 3.1 Ao</td>
<td>6.5 minutes</td>
<td>MVP 4 ADO II AS 54 (4<em>2 et 5</em>2) 1 sheathless</td>
<td>29 +/- 49</td>
<td>LPA obstruction 3 TR 2</td>
</tr>
<tr>
<td><strong>&lt; 1 kg</strong></td>
<td>3.2 mm</td>
<td>6.1 minutes</td>
<td>MVP 2 ADO II AS 19</td>
<td>11 +/- 9</td>
<td>Late CoA TR 1</td>
</tr>
</tbody>
</table>

- **PDA**: Patent Ductus Arteriosus
- **Fluoroscopy**: Duration of x-ray exposure
- **Device**: Type and size of implant used
- **Dose**: Radiation dose in mG
- **Complications**: Adverse outcomes following the procedure

**Note**: PDA size is given in millimeters, and fluoroscopy time is in minutes.
Résultats: irradiation

Radiation over the years

<table>
<thead>
<tr>
<th>Year of KT surgery</th>
<th>Dose (in mg)</th>
<th>Missing data</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2014</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>2015</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>2017</td>
<td>32</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean (Std) = 88 (74.3), 42.9 (32.8), 46.9 (80.6), 14.1 (21.7), 22.7 (46.2)

Median (IQR) = 100 (20;100), 34.3 (19;76), 27 (7;43), 5.7 (4;13), 5.4 (3;10)
Résultats: devices

Categorized prosthesis diameter according to the weight birth group

PVALUE = 0.0002

<table>
<thead>
<tr>
<th>Group of weight</th>
<th>Prosthesis diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=1 kg</td>
<td>73.7%</td>
</tr>
<tr>
<td>1-2 kg</td>
<td>54.5%</td>
</tr>
<tr>
<td>&gt;2 kg</td>
<td>82.4%</td>
</tr>
</tbody>
</table>

Prosthesis diameter: 3, 4, 5
Résultats

Figure 1.5.8. Weight/prosthesis diameter according to the year of KT surgery

Plus petits bébés avec canaux plus larges
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Results

• Succès 99%

• Complications: 2 occlusions APG traitées par chirurgie, 1 sténose APG traitée par KT, 1 coarctation dell’arte tardive traitée par chirurgie, 3 fuites tricuspides par rupture de cordage suivies, 1 accélération sur l’arc aortique suivie)LPA occlusions treated by surgery

• Décès: 7 non liés à la procédures (IRA, hémorragie cérébrale, hémochromatose, entérocolite, insuffisance respiratoire)
Présent: The French Multicenter Data on Transcatheter PDA closure in Premature infants

- plus large série
- taux acceptable de complication
- learning curve
- décès non liés à la procédure
- traitement de seconde ligne à la place de la chirurgie
- traitement de première ligne ?????
Prémiclose

- Registre prospectif multicentrique
- Prématurés de moins de 2 kg
- Résultats de la procédure
- Evolution à 1 an
- Inclusions débutées
Surgical management of a patent ductus arteriosus: Is this still an option?

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Futur

Fermeture des canaux prématurés Gold standard
Fermeture des canaux Echo Guidés à la couveuse
Conclusions

- Prothèses résorbables
- Miniaturisation des systèmes de délivrances
- Fermeture sous IRM, sans Rx