Percutaneous Closure of Atrial Septal Defect
Atrial Septal Defect
Percutaneous ASD Closure

Indications

Ostium secundum ASD with
- Clinical symptoms
- Qp/Qs >1.5:1
Percutaneous ASD Closure

Contraindications

- Resting pulmonary hypertension
- Non-secundum type ASD
- Insufficient septal rims
- Pregnancy
- Extensive congenital cardiac anomaly
- Recent infection or sepsis
- Contraindication to antiplatelets
- Intracardiac thrombi
# Surgery vs. Percutaenous

<table>
<thead>
<tr>
<th></th>
<th>Device (N=442)</th>
<th>Surgical (N=154)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical success</td>
<td>96%</td>
<td>100%</td>
<td>NS</td>
</tr>
<tr>
<td>Procedure time, min</td>
<td>106 ± 43</td>
<td>160 ± 54</td>
<td>&lt; 0.001</td>
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<tr>
<td>Hospital stay, day</td>
<td>1.0 ± 0.3</td>
<td>3.4 ± 1.2</td>
<td>&lt; 0.001</td>
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<tr>
<td>Complications</td>
<td></td>
<td></td>
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<tr>
<td>Major</td>
<td>7 (1.6%)</td>
<td>8 (5.2%)</td>
<td>0.03</td>
</tr>
<tr>
<td>Minor</td>
<td>27 (6.1%)</td>
<td>29 (18.8%)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Overall</td>
<td>32 (7.2%)</td>
<td>37 (24.0%)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>1-year success rate</td>
<td>98.5%</td>
<td>100%</td>
<td>0.33</td>
</tr>
</tbody>
</table>

*Kramer P, TCT 2003*
ASD Closure Devices

The Big Four

Amplatzer
CardioSEAL / Starflex
HELEX
PFOStar
ASD Closure Devices

“Ideal” ASD Repair

- Minimally invasive
- Procedural safety
- Simplicity
- Efficacy
- Low profile “patch”
- Conforms to variable anatomy
- Long term biocompatibility
Procedural Results

- Procedural success rate; 95%-98%
- Very rare complication (<0.5%)
  - Entrapment in RA structures
  - Inability to release, withdraw
  - Twisting of device
  - Dislodgment
  - Thrombosis

Bialkowski J, Rev Esp Cardiol. 2003;56:383
Occlusion Rate with Time

N=172

Bialkowski J, Rev Esp Cardiol. 2003;56:383
Thrombosis

- Very rare: 0.05~0.2%
- Related to:
  - Poor implant apposition
  - Poor device endothelialization
  - Underlying prothrombotic states

*Krumsdorf U et al. J Am Coll Cardiol 2004;43:302*
Thrombosis

Poor apposition

Delayed endothelization
Conclusion

Percutaneous closure of the secundum ASD is a safe, effective, and less invasive treatment than surgical closure.
ASD Closure With Amplatzer Device
Amplatzer®
Septal Occluder

- Self-Expandable
- Short-connecting Waist
- Nitinol Wire .004” - .008”
- Sizes: 4-38 mm

Device Size (Waist = A)
RA Disc (B)
LA Disc (C)
Length of Waist = (D)
Amplatzer®
Sheath Selection Guide

6F: 60 cm, Device Size 4-10mm
7F: 60 or 80 cm, Device Size 11-17mm
8F: 60 or 80 cm, Device Size 18-20
9F: 80cm, Device Size 22-24
10F: 80 cm, Device Size 26-30
12F: 80 cm, Device Size 32-38
Amplatzer®
Sizing Balloon
Amplatzer®
Device Size

• Connecting waist $\leq 2$mm greater than stretched diameter of defect
• Defects up to $\leq 36$ mm in diameter
• Rim of $\geq 5$mm on all sides
Amplatzer® Delivery System
Attach the loading device to the delivery sheath. Advance the device into the sheath by pushing (not rotating) the delivery cable.
Amplatzer®
Deployment
Endothelialization

Amplatzer

Amplatzer

Endothelialization
ASD Closure With CardioSEAL / Starflex
CardioSEAL
Starflex
CardioSEAL: Device

Fabric: Dacron

Framework: MP35N
Novel Delivery System

Single operator
Minimal septal distortion d/t 180° pivoting
CardioSEAL

180° Pivoting
CardioSEAL
180º Pivoting
CardioSEAL
Attachment
CardioSEAL

Flushing
CardioSEAL: Device

Suitable For

• ASDs up to 25 mm
• Fenestrated Fontan
• Muscular VSDs
• Window-type PDAs