Site of Paravalvular Leak Influences Leaflet Blockage by Amplatzer Device


Depts of Cardiac surgery and Cardiology, Bichat
Prosthetic-valve paravalvular leakage (PVL)

- Incidence after mechanical valve implantation ≈5% (up to 0.6% /patient-year).\(^1\)
- Symptoms depend on size:
  - Small leaks
    - asymptomatic
    - hemolysis
  - large leaks
    - hemodynamic changes
    - heart failure
Prosthetic-valve paravalvular leaks

- Gold-standard treatment is surgery to repair or replace the valve
- However, surgery is associated with
  - high morbidity and mortality rates
  - some patients are poor surgical candidates
  - increased risk of recurrence

Percutaneous closure is possible
## Percutaneous closure of paravalvular defects

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<td>eliminates the need for repeat surgery</td>
<td>lack of a specific device to perform percutaneous closure</td>
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<td>no need for CPB, cross clamping</td>
<td>absence of sufficient experience</td>
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<td>complexity of the procedure</td>
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<td>relatively high rates of occluder dislodgment</td>
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**RISK OF VALVE MALFUNCTION**
Model

- Pig heart
- Saint-Jude Medical® Masters bileafet mitral valve
- Implantation using plegdeted sutures with preservation of the anterior leaflet (*as performed in humans*)
- Gap deliberately created in sewing cuff and Amplatzer® occlusion device was surgically positioned to close the paravalvular gap

Mobility of the leaflets was examined according to different orientations of the mechanical prosthesis
results

Leaflets’ mobility is limited regardless of the orientation of the prosthesis but

- is less in the region of the pivots (elevated in the SJM prosthesis distancing the leaflets from the device)
- complete obstruction of the leaflet when the device is located at 90° from the site of pivots
CONCLUSIONS

- The site of the PVL should be taken into consideration prior to attempting transcatheter closure.

-Leaks situated at 90° from the pivots are high risk zones for complete leaflet obstruction of a mechanical prosthesis following deployment of the Amplatzer device.