Transcatheter Pulmonary Valve implantation

The role of imaging for patients selection and procedure monitoring

Mario Carminati - IRCCS Policlinico San Donato, Milan
• 18mm Contegra modified-bovine jugular vein with valve segment
• NuMed Platinum Iridium Stent
  – 28 mm length
  – Crimped down to 6mm, re-expanded 18mm up to 22mm
• Balloon Expandable system

Melody®
Transcatheter Pulmonary Valve

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Melody® Indications

- Extend the functional life of the RV-PA conduit
- Restore & maintain pulmonary valve competence
- Relieve conduit stenosis without inducing regurgitation
RVOT disfunction: target population

- **FALLOT**
  - PA + VSD: 32%
  - TGA+VSD+PS: 29%
  - PA + VSD: 11%
  - TRUNCUS: 9%
  - Ross: 8%
  - Others: 11%

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Patient Selection

- **RV outflow tract obstruction (RVOTO)**
  - RV systolic pressure $\geq \frac{2}{3}$ of systemic

- **Moderate to severe regurgitation (PR)**
  - Impaired exercise capacity ($<65\%$ of predicted)
  - Significant RV dilatation / dysfunction
Patient evaluation

- Clinical/functional (CPEX)
- ECG/Holter
- Echocardiography
- Cardiac MRI
REDUCED EXERCISE CAPACITY

Giardini, Am J Cardiol 2007

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Echocardiography

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Echocardiography

FR 24 Hz
18 cm

2D
55%
3D
50
P Basia
AGen
CF
68%
2.5 MHz
WF Alto
Medi.

Vmax
399 cm/s
V media
244 cm/s
PG max
64 mmHg
PG medio
30 mmHg
VTI
101 cm

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Severe Tricuspid regurgitation
Magnetic resonance imaging

- RVOT morphology
- Pulmonary trunk/branches anatomy
- RV size and function
- Evaluation of pulmonary stenosis/regurgitation (regurgitant fraction)
Magnetic resonance imaging

- RVOT morphology (suitability?)
MR + 3D reconstruction

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Distal conduit stenosis
LPA severe hypoplasia
LPA severe hypoplasia
CT as an alternative to MR
Extensive conduit calcification
Prestenting + Melody
VD, 32 y, TGA+VSD+PS, Rastelli with RV-PA homograft 18
Conduit severe stenosis and calcification
Prestenting with CP covered stent
Incomplete stent expansion
Post-dil with Mullins high pressure balloon
Final Angio post Melody implantation
RV-PA conduit / coronaries
Balloon inflation and simultaneous aortogram
Device Components – SAPIEN Valve

**Sizes**
- 23mm (14.3mm high)
- 26mm (16.1 mm high)

**Tissue**
- Edwards tissue technology with 20 years of clinical performance
- Bovine pericardial tissue
- ThermaFix treatment

**STENT**
- Stainless steel
- Balloon expandable

**PET skirt**
Matrix 25 mm conduit: stenosis and regurgitation
PA angiogram

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26 Sapien implant
Final PA angiogram
Pre-procedure evaluation

- MR is the gold standard for:
  - RVOT morphology
  - RV volumes/function
Intraprocedure monitoring

• Angiography is the gold standard
  (more sophisticated technology as rotational angiography may be very helpful)

* Very little role, if any, of echo
Thank you for your attention!

Mario Carminati