Native valve, Conduit stenosis or leakage?
How can the interventionalist help?

P. Ewert
German Heart Center Munich
How can the interventionalist help with a little help of our friends...

Complications in Congenital Heart Diseases
Development of percutaneous pulmonary valve replacement
How long did a transcatheter valve last?

Survival without valve dysfunction

- mean FU 3.0 years
- 470 patient years

15 events
- 5 deaths
- 3 valve in valve
- 7 surgical valve replacements

n = 160
Complications in Congenital Heart Diseases
-with a little help of our friends

Native valve, Conduit stenosis or leakage?

How can the interventionalist help??
Transcatheter valve replacement

Pulmonary valve transcath. intervention vs. surgery

- minimally invasive
- short hospital stay
- 16 yrs experience
- modest reimbursement

- cardiopulmonary bypass
- longer hospital stay
- (longer experience)
- better reimbursement
The dilemma of optimal timing (re-do surgery)

- Risks of Repeated Surgeries
- Risks of Irreversible RV Failure
Transcatheter valve replacement

Risks of surgical pulmonary valve implantation

Situs without pre-operations
Risks of surgical pulmonary valve implantation

Transcatheter valve replacement

Courtesy P. Bonhoeffer

re-re-re-...do

aorta behind sternum coronaries CPB...
Transcatheter valve replacement

Melodyklappe in Conduit
Transcatheter valve replacement

originally designed as re-do-procedure

calcified homograft
Comparison of outcome

surgery
catheter
Transcatheter valve replacement

Risks of transcatheter pulmonary valve implantation

conduit rupture
Transcatheter valve replacement

Risks of transcatheter pulmonary valve implantation

Exclude coronary compression before stent implantation
Transcatheter valve replacement

Comparison of the individual surgical vs. interventional risk

- high risk of coronary compression
- only once operated before

=> surgery!
Comparison of the individual surgical vs. interventional risk

Transcatheter valve replacement in a 72 yrs old pt.
transcatheter valve replacement

technical limitations

22F delivery system
18kg BW
transcatheter valve replacement

technical limitations

14mm Melody

3.4 yrs.
16kg,
12 mm Contegra
Native Outflow Tract and Transannular Patch

Pulmonary valve implantations
German Heart Center
n = 171

Conduit: 157
Native: 14
Native Outflow Tract and Transannular Patch

Andra-Stent implanted with 26mm balloon
Native Outflow Tract and Transannular Patch

Melody implanted with 24 mm balloon
Balloon interrogation in native outflowtract

native outflowtract

LPA stent for anchoring a valve
Anchoring a long stent in the LPA stent

48mm Andra Stent on a 18mm BiB
Selective dilatation of the proximal stent
Melody valve implantation

Elongation of landing zone with longer Andra Stent Melody implantation in „cage“

„de-jailing“ of the RPA with Atlas-Balloon
Melody valve implantation

Final result
Percutaneous valve implantation in large RVOT

„de-jailing“ of the RPA with Atlas-Balloon
Creation of a Y-stent

Balloon expandable Y-Stent

two 26mm Maxi stents, ev3
How to treat such a bifurcation?

Matrix P valve, distal anastomosis stenosis
Creativity and Innovation in Pulmonary Artery Stenting

pre-dilatation of the struts
Implantation of a pulmonary valve
71 yrs
ROSS 4 yrs ago
Endocarditis
Re-PV replacement
Feb. and Aug. 2005
TV reconstr. März 2006
TV replace. Dez. 2006

actual:
Pulmonary stenosis/-regurg.
TV-regurgitation

Transcatheter double valve replacement
„Procedure-Life-Balance“

- normal
- PR – PS
- homograft
- Melody

RV function vs. Age (years)

Courtesy M. Gewillig
Indications for pulmonary valve replacement

Have the surgical and transcatheterer replacement still the same indications?

"Free PR with progressive or moderate-severe RV dilatation, important TR, sustained atrial or ventricular arrhythmia or symptoms such as deteriorating exercise performance"

"RVOTO with RV pressure 2/3 of systemic"

"Mild to Moderate PS/PR leading to progressive RV dilatation, dysfunction or symptoms"

CCS Consensus: 2001 Update
Complications in Congenital Heart Diseases
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P. Ewert
German Heart Center Munich

Lausanne
6/2015
Endokarditis-Risiko nach PPVI

Multicenter Befragung AG Interventionen

DGPK, Leipzig 2016

3245 Patienten-Jahre

2886 vs. 358

Melody 89%

Sapien 11%
Endokarditis-Risiko nach PPVI
Multicenter Befragung AG Interventionen

Endokarditisinzidenz/Patientenjahr

Melody: n.s.
Sapien: 0,2

Sapien: 0,4
Melody: 0,6
Sapien: 0,8
Melody: 1,0
Sapien: 1,2
Melody: 1,4
Sapien: 1,6

Sapien: 358
Melody: 2886
## Endokarditis-Risiko nach PPVI

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All Bioprosthetic Valves Are at Risk for BE

Incidence (1\textsuperscript{st} yr) = 1-3%
Incidence (1\textsuperscript{st} 5yrs) = 3-6%

In der DGPK: 1,3%

Alonso-Valle, JTCVS, Apr, 2010