Transcatheter Pulmonary Valve Replacement

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Disclosure

- I have no relationships with industry to report
- Many aspects of my work and this talk involve off-label use of FDA-approved devices
TPVR: Background

Many congenital heart defects require surgical placement, and subsequent replacement, of a Right Ventricle to Pulmonary Artery conduit.
Example: Truncus Arteriosus at Birth
Example: Truncus Arteriosus Repair

Right ventricle to lung artery conduit placed
TPVR: Background

- RV-PA conduits were first described 45+ years ago, and are used widely today
- Sources include human homografts and bovine jugular veins (Contegra)
- RV-PA conduits have a tendency to fail
- Children, for better or worse, grow
TPVR: Background

- Traditional replacement of RV-PA conduits is surgical, with low mortality but the potential for significant morbidity.

- RV-PA conduit stenosis can be treated with balloon or stent angioplasty.

- Previously there has been no percutaneous option for treatment of RV-PA conduit regurgitation.
TPVR: Background

- Historically, pulmonary valve regurgitation has been viewed as a long-term concern.

- Mounting evidence has shown that untreated pulmonary valve regurgitation can cause significant problems:
  - RV dilation and dysfunction
  - Exercise intolerance
  - Ventricular arrhythmias
  - Sudden cardiac death
TPVR: Goals

- Timely restoration of pulmonary valve function in children and young adults with dysfunctional RV-PA conduits
- Minimally invasive approach
- Long-term results comparable or superior to surgical conduit replacement
TPVR: The Bonhoeffer Valve

- In 2000, Philipp Bonhoeffer et al. reported the first in man percutaneous insertion of the pulmonary valve
TPVR: The Bonhoeffer Valve
TPVR: The Melody Valve

- In 2010, the Medtronic Melody Valve, modeled on the Bonhoeffer valve, was approved by the FDA under a Humanitarian Device Exemption.
TPVR: The Melody Valve
TPVR: Melody Valve Implant

- {Technique for delivering the valve}
TPVR: Melody Valve Results

- {Outcomes of Melody valve implant}
- {Comparison with surgical conduit replacement}
- {Our experience here at Mercy}
TPVR: Edwards Valve

- {Brief introduction of Edwards Valve in TPVR}
TPVR: Future Applications

- {TPVR in dilated RV-PA outflow without conduits}
- {Smaller & Safer}
- {Planning procedures rather than taking a reactive approach}