

New Concept in Surgical Treatment of ToF Using Injectable Valve for Total Primary Repair (Preliminary Results)

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Background: Our experience using valve conduits while performing total repair of Tetralogy of Fallot (ToF) is less than desirable due to the mismatch between the fast growing child and the non-growing conduit. Its durability is limited, since a bigger conduit is needed as the child grows up. Biointegral Injectable conduits have been successfully used for secondary implantation in ToF, generally large sizes (from 23 to 31 mm), with good mid term results.

Objective: While performing total repair of ToF, the small pulmonary artery is opened, a patch is implanted and a relatively large valve is injected, which eliminates, for the first few years, the mismatch problem. We compared the durability of this new concept with our experience with different kinds of valve conduits.

Method: From September 2010 to November 2011 we implanted centrally 9 injectable valves, sized 15, 16, 17 and 19 mm (mean diameter 17,6 mm). Mean age was 21,8 months, range from 2 months to 5 years. Half of the patients were younger than 10 months.

After VSD closure, we opened the RVOT and implanted a generous patch. Patch was premeasured to obtain an as large as possible RVOT diameter, compatible with age and chest dimensions. Before suturing the lower part of the patch, an oversized valve was implanted, squeezing it to the RVOT diameter. No problems occurred either during CPB weaning or thereafter. No major pulmonary insufficiency, either intra- or periprosthetic, was observed.

Follow-up 2D echocardiograms have shown relatively fast growing Pulmonary Artery distal to the valve. No fibrin deposits and no evidence of distal pulmonary obstructions have been observed so far.

Conclusion: The use of injectable biological oversized valves squeezed to a diameter which is appropriate for age and chest dimensions promises a longer freedom from reoperation. This is due to the fact that during years, as RVOT grows up, the prosthesis tends to enlarge returning to its original size.