Ross Operation with decellularized pulmonary allografts: medium-term results

Costa F, Dohmen P, Vieira E, Lopes SV, Colatusso C, Pereira EW, Matsuda CN, Cauduro S

Objective
To evaluate the medium-term results (4 years) of decellularized allografts during Ross Operation.

Methods
From January 2003 to February 2007, 68 patients underwent Ross Operation with decellularized allografts. Forty eight were male and the mean age was 30.3 ± 11.2 years. Decellularization was done with deoxicolic acid (DOA) in 35 cases and with sodium dodecylsulfate (SDS) in 33. For comparison of the gradients, 68 patients with cryopreserved allografts and matched for age were selected. All patients had a control echo before hospital discharge and annually thereafter. In addition, eight patients had MRI studies. In two patients, samples of the conduit wall were analyzed by histological analysis.

Results
There was one (1.4%) early death. In the late follow-up, there were two reoperations for endocarditis and one late death. The early gradients varied between 429 mmHg (m= 10.3 ± 5.5 mmHg) and exhibited an increase to 16.5 ± 12.2 mmHg (min=4, max=45) at 24 months postoperatively. There were no significant differences when compared to the cryopreserved group. There was, however, a tendency towards lesser gradients in the SDS decellularized group after 12 months. Histological analysis revealed partial reendothelization and progressive repopulation of the tunica media with autogenous cells. There was no progressive pulmonary insufficiency. The MRI results showed a lesser tendency to shrinkage in the decellularized conduits.

Conclusions
The use of decellularized allografts was safe and with good medium-term results up to 4 years. There was a tendency to lower late gradients in the SDS decellularized allografts after 12 months.

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