Long-term results of the Ross operation: an 18-year single institutional experience. Eur J Cardiothorac Surg. 2014 Sep;46(3):415-22; discussion 422. doi:10.1093/ejcts/ezu013. Epub 2014 Feb 23. F da Costa [1], J Takkenberg [2], D Fornazari [3], E Filho [3], C Colatusso [3], M Mostafa Mokhles [2], A Beatriz B da Costa [3], A Sagrado [3], A Ferreira [3], T Fernandes [3], S Lopes [3]

Affiliations: [1]Department of Cardiovascular Surgery of Santa Casa de Curitiba - PUCPR, Curitiba, Brazil fcosta13@mac.com. [2]Department of Cardiovascular Surgery, Erasmus University Medical Center, Rotterdam, Netherlands. [3]Department of Cardiovascular Surgery of Santa Casa de Curitiba - PUCPR, Curitiba, Brazil.

Abstract

Objectives: The purpose of the study was to assess the 18-year outcome of the Ross operation (RO), with emphasis on survival, reoperations, and late function of the pulmonary autografts (PAs) and the right-sided pulmonary allografts.

Methods: Between May 1995 to July 2013, 414 patients with a mean age (mean ± standard deviation) of 30.8 ± 13.1 years were submitted to an RO with the root replacement (n = 356) or the inclusion (n = 58) technique. The most prevalent etiology was bicuspid valve (n = 206, 49.8%). Patients were divided in four groups depending on the type of allograft used on the right side. The mean follow-up was 8.2 ± 5.2 years and was 97.7% complete. In addition to longitudinal outcomes determined by means of the Kaplan-Meier analysis, log-rank test and Cox regression analysis were used to identify predictors of valve failure.

Results: The early mortality rate was 2.7% and the late survival rate was 89.3% at 15 years, similar to an age- and sex-matched population. There were 22 reoperations on the PA (90.7% freedom at 15 years) and 15 on the pulmonary allografts (92.5% freedom at 15 years). The freedom rate from more than mild aortic insufficiency (AI) was 73.1% at 15 years. Thirty-three patients presented with a late root diameter >45 mm, corresponding to a freedom rate of 72.4% at 15 years. Patients with AI and a dilated annulus, especially males, are at greater risk for these complications. Among the right-sided allografts, fresh decellularized allografts showed significantly superior freedom from structural valve dysfunction.

Conclusions: The RO was associated with excellent long-term survival and low incidence of reoperations up to 15 years. Male patients with AI and dilated annulus are at increased risk for late insufficiency and root dilatation. Fresh decellularized allografts presented the best results for reconstruction of the right ventricular outflow tract.

Keywords: Decellularization; Pulmonary autograft; Surgery; Tissue engineering; Valves.