

Complex Aortic Root Surgery – Experience from University Hospital Center Zagreb

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Introduction: Improved long-term outcomes and proven survival benefit^{1,2} of the aortic valve-sparing surgery and the Ross procedure increased their utilization in patients with aortic root pathology at comprehensive valve centers. The primary goal of reconstructive surgery is to reestablish normal aortic root anatomy and proper valve motion and function. In cases of aortic root pathology, echocardiography plays a crucial role in defining valve morphology, quantifying aortic regurgitation and its mechanisms, assessing the quality of the valve tissue, and analyzing the performed surgery. The 2D and 3D echocardiography are the keystone in patient selection and predicting the likelihood of a successful reconstruction.³ However, finding the best alternative for young and middle-aged adults necessitating aortic valve replacement (AVR) is a challenge for the heart team. For young patients with aortic valve disease, the Ross procedure presents a viable substitute compared to prosthetic AVR.⁴

Patients and Methods: We retrospectively analyzed patients with aortic root dilatation, aortic insufficiency, aortic stenosis, or mixed aortic valve disease who underwent complex aortic root surgery at our institution from September 2022 to March 2025. This surgery included the David procedure, Florida sleeve modification, isolated aortic valve repair, and Ross procedure.

Results: Among 67 identified patients (16 (23%) were females), 41 (61.2%) underwent David procedure, 4 (6%) the Florida sleeve, 11 (16.4%) isolated aortic valve repair, and 11 (16.4%) the Ross procedure. There were 49 adults (73%), mean age of 44 years (23-77; SD 13.1) and 18 (27%) pediatric patients, mean age of 9 years (0-17; SD 6.0). The median EuroScore II for adults was 5.7% (IQR 4.5-8.0), and there was no in-hospital mortality.

Conclusion: Despite the complexity of the aortic root functional anatomy, the modern surgical approach in complex aortic root surgery and Ross procedure is associated with better long-term outcomes than AVR^{1,2,4}. The success of aortic valve-sparing surgery and the Ross procedure greatly relies on the dialogue between cardiac surgeons and imaging cardiologists. An accurate, systematic, and detailed echocardiography analysis, particularly 3D techniques, facilitates surgical planning and represents the key to success in this evolving field with the brightest future in heart valve surgery.

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LITERATURE

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