Minimally Invasive Implantation Of The New Konect Resilia Aortic Valved Conduit. First Clinical Series. Early And Mid Term Results.

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Background

The lifelong management of patients requiring aortic root replacement continues to present a significant clinical challenge. Individuals with aortic root pathology are typically younger than the average patient with aortic stenosis [1]. Although the Bentall-de Bono procedure using a mechanical valved conduit provides excellent long-term durability, the risk of thromboembolic events and the necessity for lifelong anticoagulation—with its inherent bleeding risks—remain major concerns that adversely affect quality of life [1].

The newly developed KONECT RESILIA Aortic Valved Conduit (Edwards Lifesciences, Irvine, USA) was designed to overcome some of these limitations. This “off-the-shelf” composite graft integrates the Carpentier-Edwards PERIMOUNT Magna Ease aortic valve stent—featuring RESILIA™ tissue leaflets, a next-generation bioprosthetic material with enhanced resistance to calcification—with a DualFit sewing ring preassembled to a Terumo Gelweave Valsalva Graft™ [2,3]. The improved durability of RESILIA tissue compared with earlier bioprosthetic generations provides a promising option for younger patients. The device has recently received regulatory approval for clinical use in Europe.

Traditionally, a full median sternotomy has been the standard approach for aortic root and ascending aortic replacement. In recent years, minimally invasive techniques, including limited access incisions and alternative cannulation strategies, have emerged as viable options for aortic root surgery. Several studies have demonstrated that minimally invasive approaches yield outcomes comparable to conventional surgery, with the added benefits of reduced blood loss and shorter intensive care unit and hospital stays [4].

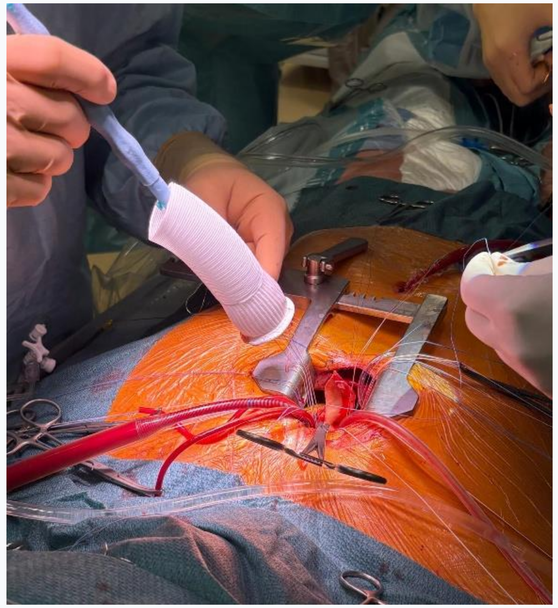
The aim of this study is to assess the feasibility, safety, and early clinical outcomes of minimally invasive implantation of the KONECT RESILIA Aortic Valved Conduit in patients undergoing aortic root replacement.

Methods

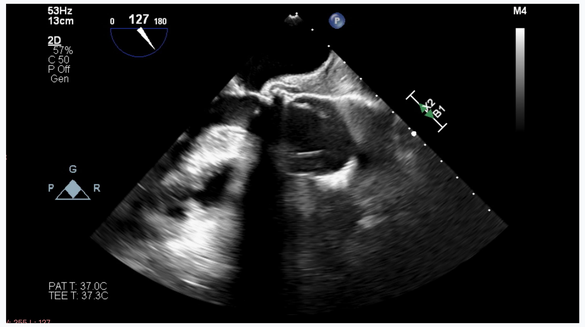
Between September and October 2025, six patients underwent aortic root replacement utilizing the KONECT RESILIA conduit at the Department of Cardiac Surgery and Transplantology, National Medical Institute of the Ministry of Interior and Administration in Warsaw, Poland. Additionally, additional procedure was performed as a live surgical demonstration at the Deutsches Herzzentrum Berlin (DHZB) during the 39th Annual Meeting of the European Association for Cardio-Thoracic Surgery (EACTS) in Copenhagen. Data on patient demographics, surgical variables, and early postoperative outcomes were extracted from a prospectively maintained double - institutional registry.

Preoperative evaluation included aortic computed tomographic angiography, coronary angiography, and transthoracic echocardiography. All operations were conducted through an upper J-shaped ministernotomy approach. Central aortic cannulation was applied in every case. Venous return was achieved percutaneously via the femoral vein. The aortic conduit was implanted intraannularly using everting mattress sutures.

Categorical variables are expressed as counts and percentages, while continuous variables are presented as mean ± standard deviation for normally distributed data or as median with interquartile range (IQR) for skewed distributions.



Intraoperative view of the KONECT RESILIA conduit implanted via mini-sternotomy.



Postoperative transesophageal echocardiography (long-axis view) showing opening of the biological prosthesis leaflets

Results

The mean age of patients was 60 ± 11 years, and 86% were male. Median EuroSCORE II was 3.5 (IQR, 3.2-6.2). Five patients (71%) presented with bicuspid aortic valves. Four patients (57%) had severe aortic stenosis (mean transvalvular gradient: 48 ± 12 mmHg), while in the remaining three cases, the native valve was intraoperatively deemed unsuitable for repair due to advanced morphological changes. The mean aortic root diameter was 51.4 ± 9.7 mm, and the maximal ascending aortic diameter was 55.6 ± 4.6 mm. Implanted valve sizes were distributed as follows: 29 mm (n = 2), 27 mm (n = 2), 25 mm (n = 2), and 23 mm (n = 1). The median cardiopulmonary bypass time was 190 minutes (IQR [175–195]), and the median aortic cross-clamp time was 125 minutes (IQR [115–132]).

There was no in-hospital mortality or major postoperative complication, including stroke, renal failure, or re-exploration for bleeding. None of the patients required permanent pacemaker implantation. Early postoperative echocardiography demonstrated satisfactory prosthetic valve function with low transvalvular gradients (mean 8 ± 1 mmHg) and no evidence of paravalvular leak. The mean intensive care unit stay was 1.4 days (IQR 1.1–1.6), and the mean total postoperative hospital stay was 6 days (IQR 4–9).

This preliminary experience confirms the feasibility and safety of using the KONECT RESILIA aortic valved conduit for aortic root aneurysm and complex aortic valve disease via a minimally invasive approach. The valve demonstrated favorable hemodynamic performance at discharge, with low gradients and no evidence of prosthetic regurgitation.

References

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