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# The First Clinical Experience of TiAra Xenobiological Variable Stiffness Stent Prosthesis Implantation in the Aortic Position

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**The aim of the study was** to evaluate the first clinical experience of TiAra xenobiological variable stiffness stent prosthesis implantation in the aortic position.

**Study Material. The TiAra biological prosthesis** consists of a xenopericardial graft mounted on a flexible shape-memory metal (nitinol) stent and is intended for implantation in the aortic position. It is fixed with a one-row twisted suture in such a way that the xenobiological valve contours follow the lines of the native aortic annulus.

**Results.** The first case of variable stiffness stent prosthesis implantation is further described.

**A patient was a 71-year-old woman** with the body surface area of 1.78 $m^2$. The primary diagnosis was a degenerative heart disease, severe aortic stenosis, and chronic heart failure 2a, Class III. Echocardiography showed the left ventricular end-diastolic volume (LVEDV) of 63 mL, LV ejection fraction (EF) of 74%, the aortic annulus of 21 mm, and AV orifice area of 0.4 $cm^2$.

**Intraoperative data.** AV leaflets were coarsely calcified and rigid. After AV excision, the diameter of the aortic annulus was 22 mm. The TiAra xenobiological variable stiffness stent bioprosthesis No. 23 was implanted in the position of aortic annulus and fixed with the twisted suture using three threads. The fixation started in the deepest part of the Valsalva sinuses and ended in the apex of the commissures. The threads were pulled out of the aorta and tied together on the inserts. The prosthesis was fixed on a xenopericardial strip extending 3 mm distal to the stent. Time of the aortic occlusion was 75 min.

**The intraoperative echocardiography** showed the peak transprosthetic gradient of 9 mm Hg at rest (ventricular contraction rate [VCR] of 74 per minute), 12.5 mm Hg on exertion (VCR of 90 per minute) and 13 mm Hg (VCR of 120 per minute). The regurgitation volume was minimal.

The postoperative period was uncomplicated.

**Discharge echocardiography** showed the LVEDV of 81 mL and LVEF of 60%. The aortic prosthesis leaflets were completely open. The coaptation was satisfactory at diastole. The prosthesis contour was undeformed. The aortic regurgitation volume was minimal.

The patient was discharged in good condition on day 14 after the operation.

**Conclusions.** The TiAra xenopericardial variable stiffness stent prosthesis implantation in the aortic position is an effective method to adequately correct impaired cardiac hemodynamics. It is preferred to implant the prosthesis which diameter exceeds the diameter of the aortic annulus. The prosthesis may be fixed intraannularly with a twisted suture using a monofilament thread.