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Case Report

TAVI for aortic regurgitation – India's first case with Corevalve Evolut R



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ABSTRACT

Transcatheter Aortic Valve Implantation (TAVI) is a well-described treatment for symptomatic calcific severe aortic stenosis. However, TAVI technology is being increasingly used around the world to treat selected cases of severe aortic regurgitation (AR). One of the main limitations of using TAVI technology for AR is the lack of calcification, which is common in such cases. This makes anchoring of a TAVI prosthesis to the aortic annulus difficult and risks displacement or embolization. However, with the availability of recapturable and repositionable TAVI technologies, these limitations have been overcome to a large extent. This is the first Corevalve Evolut R device that was used in India and the first TAVI to treat AR in India.

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1. Introduction

Transcatheter Aortic Valve Implantation (TAVI) is a well-described treatment for symptomatic calcific severe aortic stenosis. However, TAVI technology is being increasingly used around the world to treat selected cases of severe aortic regurgitation (AR). One of the main limitations of using TAVI technology for AR is the lack of calcification, which is common in such cases. This makes anchoring of a TAVI prosthesis to the aortic annulus difficult and risks displacement or

embolization. However, with the availability of recapturable and repositionable TAVI technologies, these limitations have been overcome to a large extent. This is the first Corevalve Evolut R device that was used in India and the first TAVI to treat AR in India.

2. Case report

A 45-year-old man, awaiting liver transplantation, suffered aortic valve (AV) endocarditis 9 months previously, which was

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medically treated. He was left with severe AR and a highly mobile chronic vegetation attached to his AV leaflet. He had portal hypertension, previous upper gastrointestinal bleed from varices, and hypersplenism, with a platelet count of 45,000/ μ L, hemoglobin of 8 g/dl, and an international normalized ratio of 2.0. Local heart team discussions led to contemplating TAVI to treat his severe AR before liver transplantation. Three blood cultures showed no growth of organisms.

Echocardiogram showed severe AR and a 1 cm highly mobile hyperechoic mass attached to his AV (Fig. 1). Gated cardiac CT scan showed unobstructed coronaries, no calcification of the aortic root or AV, and good caliber peripheral vessels for a transfemoral delivery of TAVI prosthesis. The plan was to squash the vegetation along with the valve leaflet behind the TAVI prosthesis using a repositionable TAVI device. A Corevalve Evolut R was chosen, which has the capability of resheathing and recapturing the device and thereby allowing redeployment if optimal positioning and outcome was not achieved.

As embolization of the chronic vegetation was a major concern; two carotid artery filters were positioned, one in each internal carotid artery before crossing the AV (Fig. 2). The TAVI procedure was performed in the standard way using 3D transesophageal echocardiogram (TOE) guidance. During the valve deployment, the valve slipped out of the annulus twice into the ascending aorta due to lack of calcification and hyperdynamic left ventricle contraction. The Evolut R device allowed resheathing and repositioning on these occasions. During these attempts, the vegetation was monitored throughout with TOE and the vegetation did not embolize. At the third attempt, rapid ventricular pacing was undertaken, which completely abolished cardiac output and the valve was released at the optimal position trapping the vegetation within the aortic sinus along with the aortic leaflet (Figs. 3 and 4). There was no AR on aortography and on TOE. There were no complications and the patient was discharged home on day 3 of the procedure. The patient was discharged on Clopidogrel 75 mg OD. The patient subsequently had a successful liver transplantation after stopping Clopidogrel for five days before

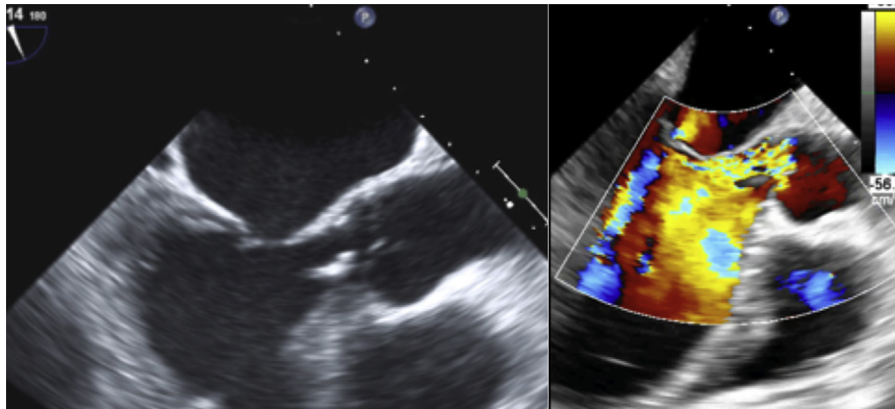


Fig. 1 – TOE showing a 1 cm mobile vegetation attached to the aortic valve leaflet causing severe aortic regurgitation.

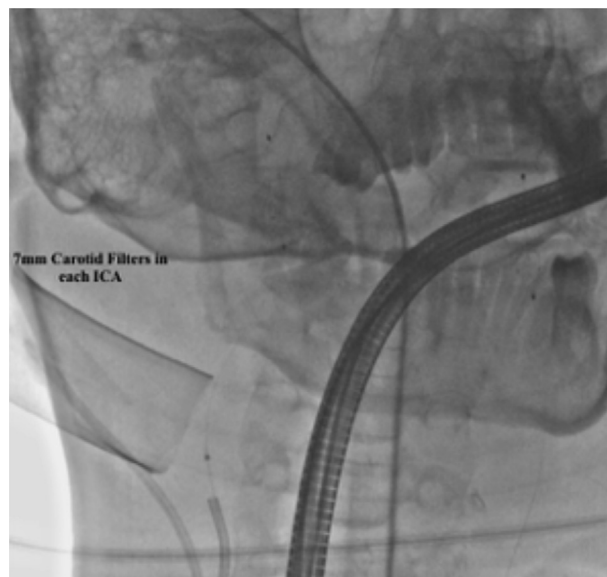


Fig. 2 – Fluoroscopy image of carotid filters in each internal carotid artery to prevent cerebral embolization of mobile vegetation.

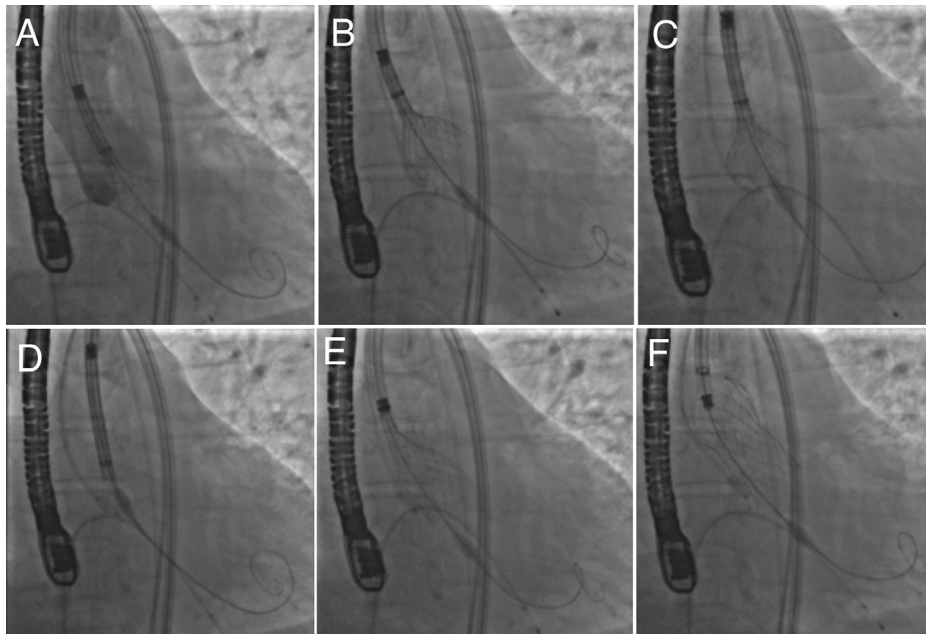


Fig. 3 – Panel A: Start of TAVI deployment showing the flaring of the TAVI valve prosthesis in the left ventricular outflow tract (LVOT) and the lower border of pigtail catheter and aortography showing the valve deployment site at the aortic annulus level (Fig. 4, Panel A). **Panel B:** Dislodgement of the TAVI prosthesis during deployment toward the ascending aorta; note that the lower border of the prosthesis is above the lower border of the pigtail, which marks the aortic annulus level. **Panel C:** TAVI prosthesis being resheathed in the ascending aorta resulting in partial recapturing of the prosthesis. **Panel D:** Further resheathing of the device leading to complete recapture of the device allowing for redeployment. **Panel E:** TAVI prosthesis redeployed in the preferred location ready to be fully released after which no resheathing or recapture is possible. **Panel F:** TAVI prosthesis completely released in optimal position as marked by the lower end of the pigtail, which was left in this case until full release.

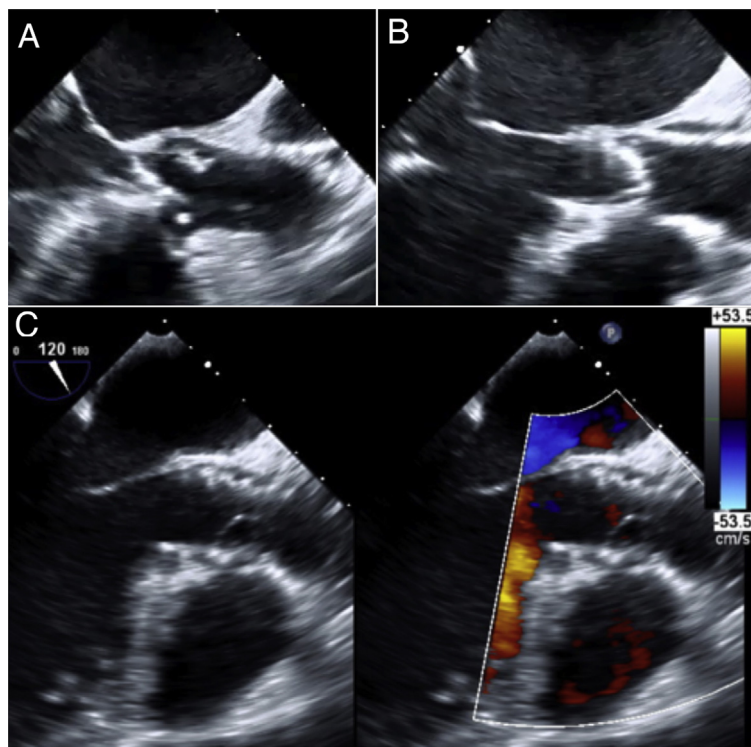


Fig. 4 – Panel A: TOE at the start of TAVI deployment showing the flaring of the TAVI valve prosthesis in the LVOT and the mobile mass along with the aortic leaflet behind the flaring prosthesis. **Panel B:** Further deployment of the TAVI prosthesis has squashed the leaflet along with the vegetation behind the TAVI prosthesis. **Panel C:** TOE after full release of the valve at optimal position, no residual mobile mass and no aortic regurgitation.

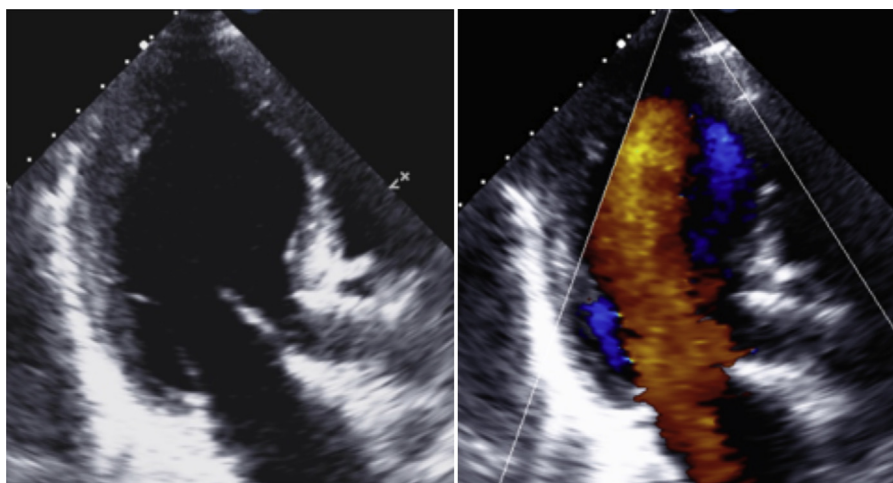


Fig. 5 – Follow-up transthoracic echocardiogram at two months showing no aortic regurgitation and no mobile mass attached to the prosthesis.

surgery and substituting it with low molecular weight heparin until the day before liver transplantation. He was discharged after transplantation with Clopidogrel 75 mg OD. At two months follow-up, the patient was asymptomatic with normal TAVI prosthetic function on echocardiogram with no AR and no visible vegetation (Fig. 5). The patient had no evidence of infection or active inflammation.

3. Discussion

This case demonstrates the feasibility and acute outcome of TAVI for AR and the benefit of having a recapturable and repositionable TAVI prosthesis. It also has shown for the first time that sterile vegetations with appropriate

anatomy may not be an absolute contraindication for TAVI. To our knowledge, this is the first human case to demonstrate this.

Conflicts of interest

The authors have none to declare.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at [doi:10.1016/j.ihj.2016.03.022](https://doi.org/10.1016/j.ihj.2016.03.022).