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Distal embolization of Edwards SAPIEN prosthesis during transcatheter aortic valve implantation

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SUMMARY: **Distal embolization of Edwards SAPIEN prosthesis during transcatheter aortic valve implantation**

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Aim. *Transcatheter aortic valve implantation (TAVI) is considered an alternative therapy in high risk patients with severe aortic stenosis. Despite this, such a minimally invasive procedure is not free from complications.*

Case report. *An 86-year-old woman underwent a 26-mm SAPIEN TAVI for aortic valve stenosis. Procedure was complicated by valve embolization into the ascending aorta likely due to a sub-optimal positioning of prosthesis during its deployment. Patient was treated by surgical removal of stent-valve and conventional valve replacement. Patient was discharged from hospital 7 days after surgery. At six months follow-up she was asymptomatic and the valve had a good competence with a mean transaortic gradient of 8 mmHg.*

Conclusions. *After TAVI prosthesis embolization, conversion to conventional surgical treatment is imperative and can be associated with excellent outcome.*

KEY WORDS: Transcatheter aortic valve implantation - Aortic valve replacement - Transfemoral aortic valve implantation.

Introduction

Transcatheter aortic valve implantation (TAVI) is currently employed in very high risk patients (1,2). Nowadays, this procedure is becoming increasingly used and growing experience is associated with improved results. Despite of this consideration, a number of severe complications may occur after TAVI which require prompt treatment. Herein we report on the case of patients who experience valve prosthesis dislocation after TAVI.

Case report

A 86-year-old woman with a history of hypertension and prior stroke with neurologic deficit resolution was referred to our institution for treatment of severe, symptomatic aortic valve stenosis. The patient was treated with right mastectomy and mediastinal radiotherapy for breast carcinoma 30 years before. She had a NYHA class III symptoms. Transthoracic echocardiogram showed a minimally calcified tricuspid aortic valve with a peak gradient of 40 mmHg and a valve area of 0.6 cm^2, associated with massive mitral annular calcification. The aortic annulus was 22 mm in diameter. Left ventricular ejection fraction was 67%.

Patient was refused for standard aortic valve replacement on the basis of her high risk for surgery (preoperative logistic EuroSCORE 20.8%) and underwent TAVI procedure performed through the right femoral artery in a standard fashion (1, 2) using a 26-mm Edwards SAPIEN valve (Edwards Lifesciences, Inc., CA, USA).

During balloon inflation, rapid ventricular pacing failed and the valve prosthesis immediately embolized into the ascending aorta. The subsequent attempt to position the valve in the descending aorta was unsuccessful and the bioprosthesis was re-expanded into the aortic arch proximal to the left subclavian artery. Because of its instability and in order to avoid a 180-degrees valve rotation the pigtail catheter was not removed and the patient was transferred to the operative room.

Operative findings and results

After a full median sternotomy, the pericardium was longitudinally opened. The intraoperative inspection demonstrated the presence of the transcatheter valve into the aortic arch just below the brachiocephalic artery. The valve was manually mobilized without opening the aorta and re-positioned just above the sino-tubular junction.

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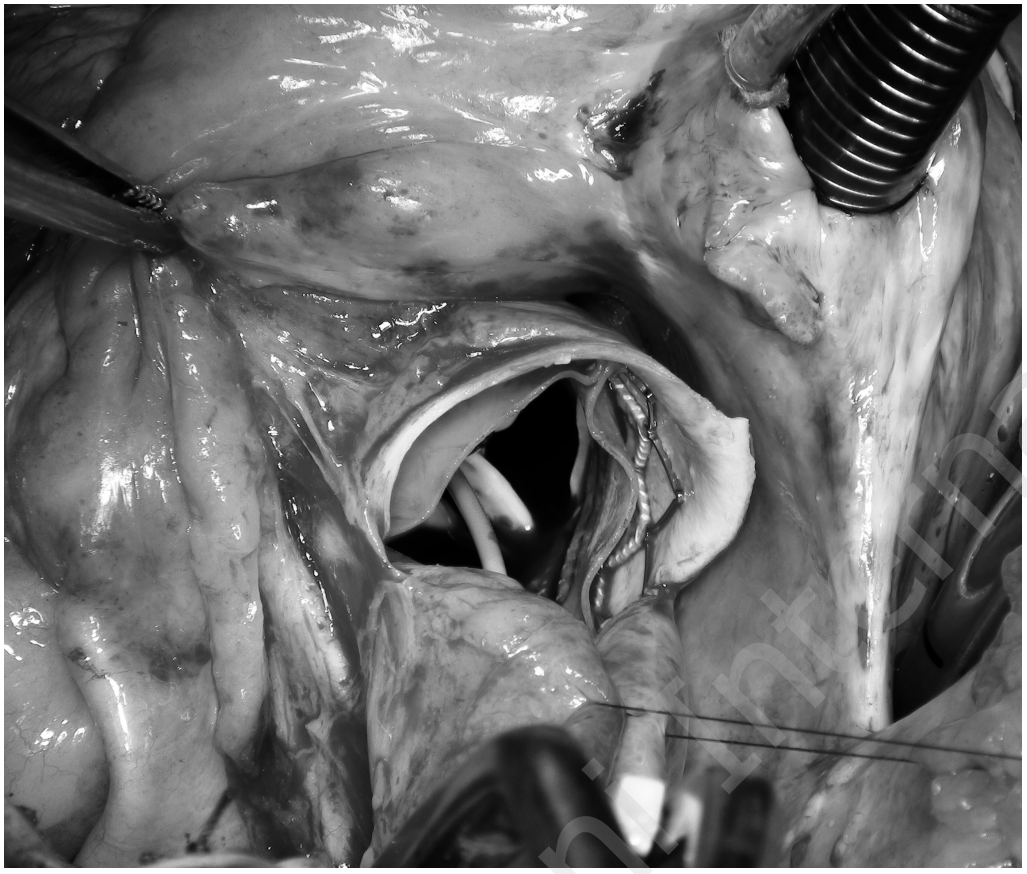

Fig. 1 - Intraoperative view of 26-mm Edwards SAPIEN valve placed just above the sino-tubular junction. The "pigtail" catheter is still through the transcatheter prosthesis.

The patient was cannulated via aorta and two-stage atrial venous cannula. After retrograde cold blood cardioplegic arrest, the aorta was opened in standard fashion (Fig. 1). The "pigtail" catheter was cut and the percutaneous valve was removed without vascular wall damaging. Surgical inspection of native valve showed the presence of mild leaflets calcification without aortic annular extension. The anterior mitral annulus was extensively calcified and protruded into the aortic outflow (Fig. 2). The native valve was easily removed and a 19 mm Carpentier-Edwards Magna Ease aortic valve (Carpentier-Edwards, Irvine, CA, USA) was implanted in a supraannular position. The aortic cross clamping time was 37 minutes and the duration of extracorporeal circulation was 48 minutes.

The following postoperative course was lacked in any major cardiac, vascular and cerebral events. The patient was discharged from hospital 7 days after surgery. At six months follow-up, the patient was asymptomatic and the valve had a good competence with a mean transaortic gradient of 8 mmHg.

Discussion and conclusion

Upon postoperative review of this case, it was concluded that this complication was probably due to several mechanisms. Sub-optimal positioning of the valve at the moment of prosthesis deployment, ventricular pacing failure, absence of major aortic valve calcifications and presence of massive mitral-aortic junction calcification were considered as possible mechanisms leading to such a technical failure. The role of valve sizing is not well established in literature, but it could represent a concomitant factor of valve migration during this procedure (1-4).

TAVI embolization of the Edwards Sapien is usually treated by valve repositioning into the distal aorta without the need for removal (3). On the other side, when valve stability is not obtained the surgical treatment becomes imperative.

In our institution, we routinely perform the upper ministernotomy to approach and treat isolated aortic valve pathology in order to reduce the complications related to the full sternotomy (5). This surgical strategy could be an alternative to TAVI in very high risk patients when general anaesthesia is not contraindicated.

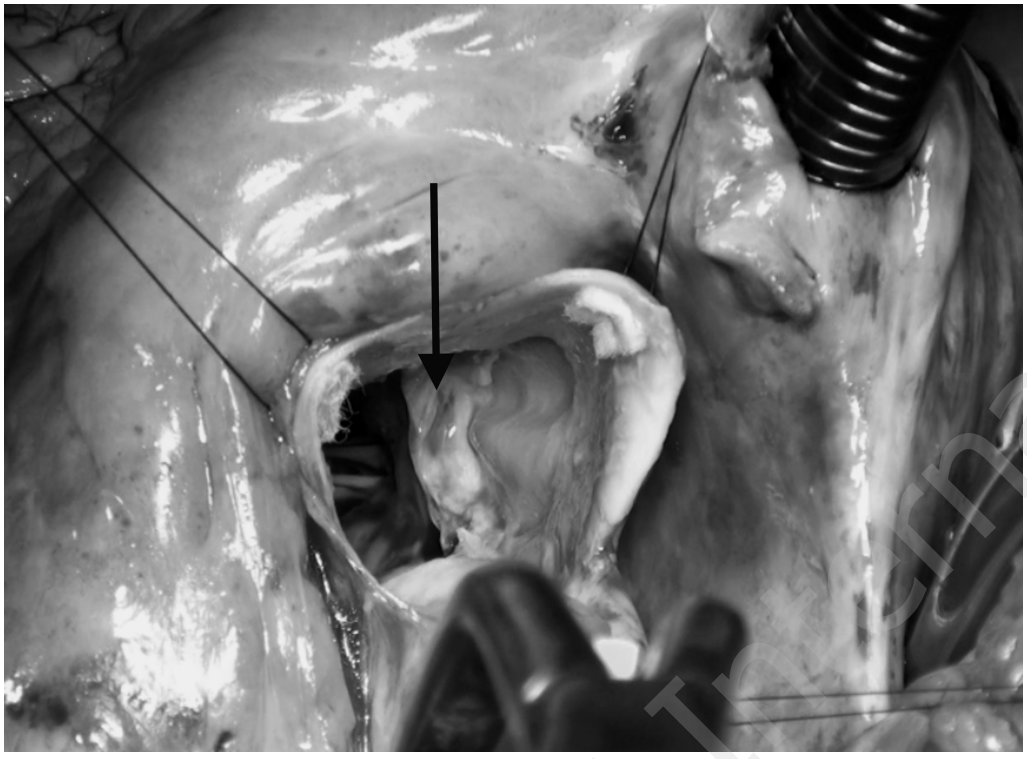

Fig. 2 - Intraoperative view after native valve ablation. The anterior mitral annulus appear calcified and protruded into the aortic outflow (black arrow).

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