Successful Management of Annulus Rupture in Transcatheter Aortic Valve Implantation

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An 82-year-old woman with severe aortic stenosis was referred to our center. Transcatheter aortic valve implantation (TAVI) was scheduled due to her high surgical risk (logistic EuroSCORE = 25.8%). The annulus diameter measured by transesophageal echocardiography (TEE) was 22.2 and 23.6 mm by multidetector computed tomography (CT). A 26-mm Edwards valve (Edwards Lifesciences, Irvine, California) was subsequently implanted via the transfemoral approach. After implantation, sudden hemodynamic collapse occurred, and aortography revealed contrast protrusion from the annulus.
aortic cusp (Fig. 1A, Online Video 1). Fluoroscopic detection of restricted heart motion with surrounding white area (Online Video 1) facilitated immediate diagnosis of tamponade before echocardiography. After percutaneous pericardial drainage via the subxiphoid approach and heparin neutralization, blood autotransfusion was performed via a circuit connecting the drainage catheter and the femoral vein sheath. Hemodynamics were stabilized within 30 min, and contrast protrusion disappeared (Online Video 2). Pre-procedural CT showed a calcified nodule (5 × 7.5 mm) at the epicardial fat segment between the interventricular septum and left atrium (Fig. 1B, arrow), and contrast leakage was observed in post-procedural CT (Fig. 1C, arrow). The patient was discharged on Day 8 without any complications. We successfully treated a similar case (with a 26-mm valve for the 22-mm TEE-measured annulus diameter) with contrast protrusion (Fig. 1D, Online Videos 3 and 4) and similar pre- and post-CT findings (Figs. 1E and 1F).

Annulus rupture is a rare complication of TAVI, reported in about 1% of cases (1,2). However, when it occurs, acute hemodynamic collapse frequently causes catastrophic outcomes. Immediate diagnosis by fluoroscopy and echocardiography, percutaneous drainage, autotransfusion of drained blood, and heparin neutralization may save lives.

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REFERENCES


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APPENDIX

For supplementary videos and their legends, please see the online version of this paper.