Endoscopic removal of a papillary fibroelastoma of the tricuspid valve

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Keywords: Papillary fibroelastoma; valve sparing surgery; tricuspid valve repair

Submitted Mar 07, 2026. Accepted for publication May 08, 2026. Published online May 28, 2026.
doi: 10.21037/acs-2026-1-0055-tvd
View this article at: https://dx.doi.org/10.21037/acs-2026-1-0055-tvd

Clinical vignette

We report the case of a 61-year-old otherwise healthy male patient with a papillary fibroelastoma located in the right atrium, who was referred to our clinic after incidental detection of a mobile intracardiac mass on echocardiography. On cardiac magnetic resonance imaging (MRI), the lesion measured 1.7 cm originating from the tricuspid septal leaflet, without evidence of tricuspid valve dysfunction. Intraoperative transesophageal echocardiography (TEE) confirmed no additional valve or cardiac pathology. The patient was asymptomatic and in an overall good condition, with no history of cardiac disease or thromboembolic events. Preoperative coronary angiography revealed no evidence of coronary artery disease. Given the tumor mobility and potential risk of pulmonary embolization, surgical excision was recommended by the local heart team with the intention of complete resection while preserving native valve competence.

Surgical technique

The procedure was performed under general anesthesia with the patient in the supine position to allow minimally invasive right-sided thoracic access. A right-sided minithoracotomy was performed through the fourth intercostal space using a 5–6 cm submammary incision. Cardiopulmonary bypass (CPB) was established via femoral cannulation with additional jugular venous cannula resulting in bicaval drainage; all cannulas were inserted using the Seldinger technique under echocardiographic guidance. CPB flow was maintained at 4.4 L/min with mild hypothermia. After pericardiotomy and placement of an aortic root cardioplegia/vent catheter in the ascending aorta as well as a left ventricular vent via the right superior pulmonary vein, the aorta was cross-clamped and cardioplegic arrest was achieved with a single antegrade dose of 1.5 L of Custodiol [histidine-tryptophan-ketoglutarate (HTK)]. Total CPB was established and the right atrium was opened to expose the tricuspid valve. Two retraction sutures were placed to optimize exposure, allowing detailed inspection of the valve.

A pedunculated tumor arising from the septal leaflet was identified and completely excised *en bloc* by limited resection of its base at the septal leaflet. Peeling of the papillary tumor was attempted but it was not possible due to the thin structure of the tricuspid leaflet. The resulting small leaflet defect was repaired by direct approximation of the leaflet remnants and by fusion of the septal and posterior leaflets. Four interrupted monofilament 5-0 polypropylene sutures (Optilene®, B. Braun, Melsungen, Germany) were used, resulting in functional bicuspidization of the tricuspid valve

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to achieve an adequate coaptation line. Valve competence was assessed by saline testing and found to be satisfactory. The right atrium was closed using a two-layer running suture (4-0 polypropylene; Optilene®, B. Braun). After careful de-airing and reperfusion, the aortic cross-clamp was released and the heart resumed spontaneous sinus rhythm.

The patient was weaned from CPB uneventfully. Intraoperative TEE confirmed complete tumor removal and preserved tricuspid valve competence without relevant residual regurgitation or stenosis. After decannulation, meticulous hemostasis, and routine thoracic closure, the patient was transferred to the intensive care unit in stable condition. Histopathological examination confirmed papillary fibroelastoma. The lesion was completely excised during surgery and the postoperative course was uneventful with discharge after a few days. Postoperative echocardiography confirmed the intraoperative findings, showing a competent tricuspid valve, preserved ejection fraction, and complete tumor removal.

Comments

Papillary fibroelastomas usually show a left-sided predominance, in about two-thirds of described cases attached to the aortic valve leaflets, followed by the mitral valve (13%) (1). Rare localizations include the papillary muscles and the left ventricular myocardium. The tricuspid valve is an uncommon location (4%) and only a few cases have been reported in the literature (1). This case demonstrates that complete excision of a tricuspid valve papillary fibroelastoma in an endoscopic setting can be safely achieved with a valve-sparing strategy in selected patients. In this case, no pre-existing valve pathology was observed. However, this approach allows for anatomical repair of the tricuspid valve also in cases of coexisting structural defects.

The primary objective of the procedure is the complete removal of the highly mobile mass to abolish the risk of pulmonary embolization while maintaining durable leaflet coaptation. Compared with valve replacement, this approach preserves native anatomy, avoids prosthesis-related complications, and eliminates the need for valve-specific long-term anticoagulation. Accordingly, tricuspid valve repair is strongly preferred over replacement and has consistently been associated with superior early and late outcomes in large observational studies (2). Limited leaflet excision combined with targeted reconstruction represents a straightforward technique when attachment is confined to a small leaflet segment. In surgical series, valve preservation can be achieved in the vast majority of patients undergoing resection of valvular papillary fibroelastomas (up to 98%) (1). Importantly, contemporary reviews emphasize that valvular papillary fibroelastomas can almost uniformly be removed using a valve-sparing resection technique, thereby avoiding prosthetic valve replacement in most cases (3).

Endoscopic techniques allow for excellent visualization of the tumor and the remaining pathology, reduce surgical trauma and facilitate postoperative recovery in selected patients. Published data suggest that endoscopic approaches provide oncologic outcomes comparable to median sternotomy while maintaining similar long-term results (4). Key caveats include meticulous preoperative and intraoperative echocardiographic assessment of tumor mobility, attachment site, and leaflet involvement, as more extensive pathology may require complex reconstruction or valve replacement. In particular, surgery on the septal leaflet warrants special attention due to its proximity to the conduction system, and reconstruction should avoid leaflet restriction, functional stenosis, or new regurgitation. In the present case, the postoperative course was uneventful and the patient was discharged after a few days; pre-discharge echocardiography confirmed preserved tricuspid valve competence without relevant residual regurgitation or stenosis. Long-term echocardiographic follow-up is recommended to ensure sustained valve function and to monitor for rare recurrence, as the literature reports recurrence rates between 1.6% to 15% (1,5).

Acknowledgments

None.

Footnote

Funding: None.

Conflicts of Interest: The authors have no conflicts of interest to declare.

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Cite this article as: Ennen V, Gollmann-Tepeköylü C, Wagner U, Theurl M, Höfer D, Bonaros N. Endoscopic removal of a papillary fibroelastoma of the tricuspid valve. Ann Cardiothorac Surg 2026;15(3):42. doi: 10.21037/acs-2026-1-0055-tvd