

# Multiple aortic valve papillary fibroelastomas: A case series of totally endoscopic resections



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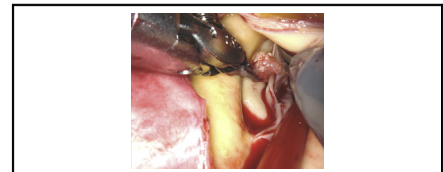
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Totally endoscopic resection of a papillary fibroelastoma on the AV left coronary cusp.

## CENTRAL MESSAGE

Totally endoscopic resection of AV papillary fibroelastomas is a safe and highly effective approach and may make surgical resection more acceptable for patients.

Papillary fibroelastomas (PFEs) are rare, benign neoplasms predominantly affecting the valvular structures of the heart, most commonly the aortic valve (AV).<sup>1</sup> These tumors are most commonly found incidentally during imaging before cardiac surgery.<sup>2</sup> While PFEs are often asymptomatic, they can be associated with devastating morbidity, including transient ischemic attack, cerebrovascular accident, pulmonary or peripheral emboli, myocardial infarction, heart failure, or sudden death.<sup>1-3</sup> Surgical resection should be offered to all patients with symptoms and to asymptomatic patients who have mobile lesions, exhibit tumor growth, or if resection is reasonable at the time of another cardiac procedure. Most often, a valve-sparing excision can be performed with excellent long-term results and negligible recurrence rates.<sup>2-4</sup> While PFEs are usually solitary, we present a series of 3 patients who all presented with multiple symptomatic cardiac masses and underwent totally endoscopic valve-sparing resection.

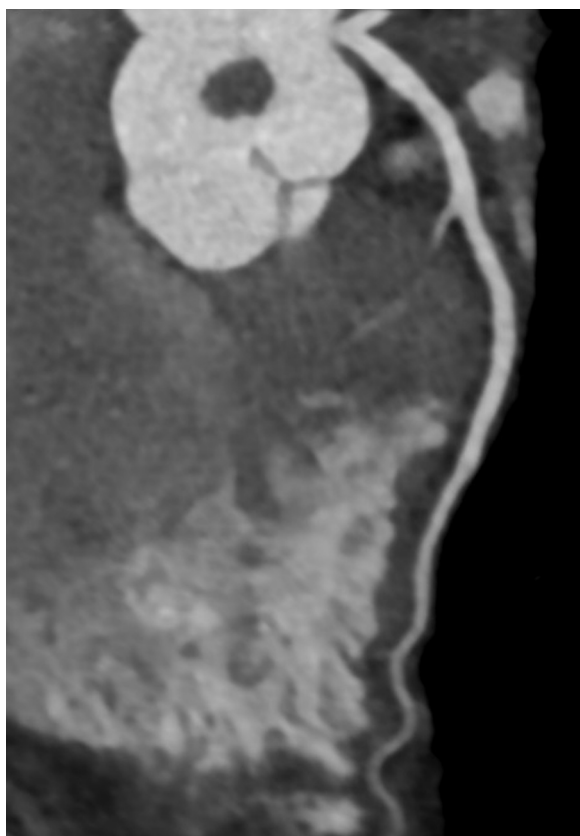
## CASE SERIES

Patient 1 was a 53-year-old man with hypertension undergoing workup for congestive heart failure. Symptoms included daily palpitations and increasing dyspnea on exertion. Coronary computed tomography angiography (CTA)

demonstrated a 1.1-cm soft-tissue mass arising from the AV (Figure 1).

Transesophageal echocardiography (TEE) confirmed an 8-mm spherical, pedunculated mass on the aortic surface of the noncoronary cusp (NCC). Totally endoscopic resection was performed with the DaVinci Xi system (Intuitive Surgical) using our standard robotic approach. Cardiopulmonary bypass was initiated using the right femoral vessels. A flexible transthoracic clamp was placed through the working port across the distal ascending aorta and antegrade cardioplegia was delivered via a needle. A transverse aortotomy was made 1 cm above the right coronary ostium and a flexible pediatric vent was placed through the AV. Inspection revealed 2 AV masses: a 1.2-cm nodular mass attached to the aortic side of the left coronary cusp (Figure 2) and a 5-mm mass to the ventricular side of the NCC.

Both masses were completely excised with a crossclamp time of 43 minutes. The patient was extubated in the operating room (OR), the chest tube was removed postoperative day (POD) 1, and he was discharged home POD 3 (Table 1). Pathology confirmed PFE (Figure 3).



**FIGURE 1.** Computed tomography angiography demonstrating 1.1-cm soft-tissue mass arising from the aortic valve.



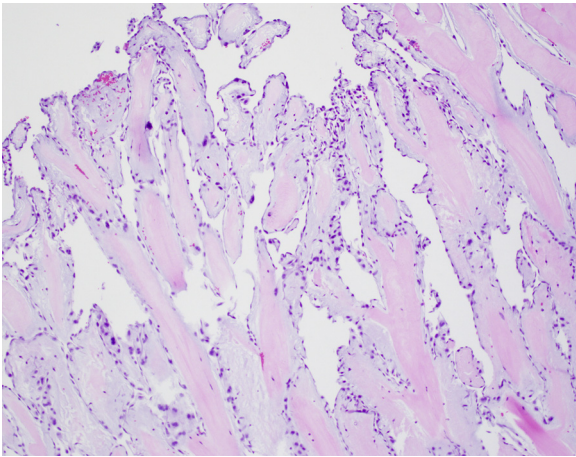
**FIGURE 2.** Papillary fibroelastoma measuring 1.2 cm on the aortic side of the left coronary cusp.

Patient 2 was a 54-year-old woman who presented with new-onset palpitations. Coronary CTA demonstrated a hypodense AV lesion and TEE revealed a 7-mm mass on the aortic side of the NCC (Figure 4).

**TABLE 1. Demographics and outcomes in 3 patients undergoing robotic excision of aortic valve papillary fibroelastomas**

Variables	Patient 1	Patient 2	Patient 3
<b>Demographics</b>			
Age, y	53	54	67
Sex	Male	Female	Female
BMI	24	34	25
Hypertension	Yes	No	Yes
Dyslipidemia	No	No	No
Atrial fibrillation	No	No	No
LVEF, %	60	70	60
Previous cardiac surgery	No	No	No
Previous CVA	No	No	No
<b>Intraoperative data</b>			
PFE size, mm, location	1.2 cm LCC, 5 mm NCC	7 mm NCC	1 cm NCC, 5 mm L/RCC
Robotic time, min	154	171	183
Bypass time, min	65	91	89
Clamp time, min	43	35	57
Concomitant procedure	No	No	No
<b>Postoperative data</b>			
Time to extubation	Intraoperative	Intraoperative	Intraoperative
Total CT output, cc	170	395	720
Days in hospital	3	4	2
Complications	None	None	None

BMI, Body mass index; LVEF, left ventricular ejection fraction; CVA, cerebrovascular accident; PFE, papillary fibroelastoma, LCC, left coronary cusp; NCC, noncoronary cusp; RCC, right coronary cusp; CT, chest tube.

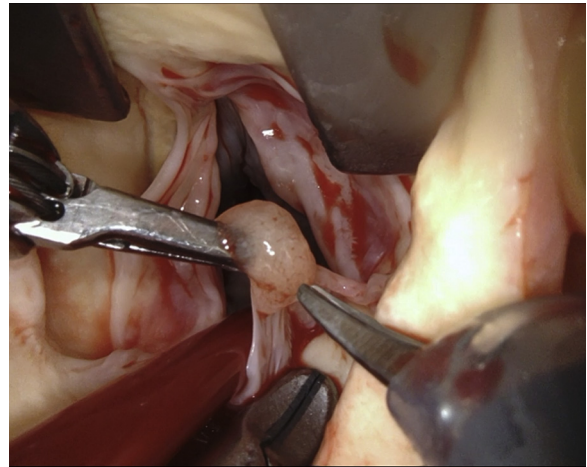


**FIGURE 3.** Arborizing fronds and avascular fibroelastic core lined by endocardium, characteristic of papillary fibroelastoma.

Surgical resection was performed using the same technique. Intraoperative inspection of the AV revealed a 7-mm mass on the margin of the NCC, which was excised (Figure 5).

A suspicious 5-mm mass with a gelatinous appearance was excised from the left ventricle and sent for frozen section, determined to be a benign myxoid lesion. Crossclamp time was 35 minutes. The patient was extubated in the OR, chest tube was removed POD 1, and she was discharged home POD 4 (Table 1). Pathology confirmed AV PFE and recanalized chronic thrombus.

Patient 3 was a 67-year-old woman with hypertension who presented with chest pressure. Coronary CTA



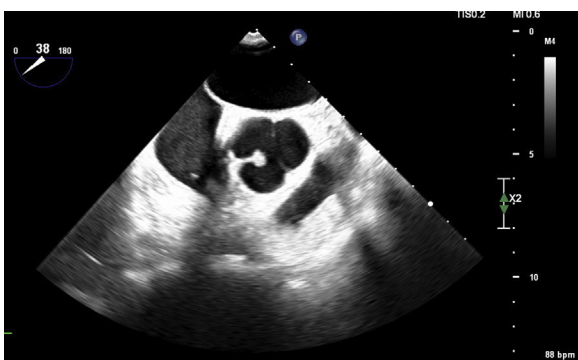
**FIGURE 5.** Papillary fibroelastoma on the margin of the aortic valve non-coronary cusp.

demonstrated 2 hypodense masses on the aortic side of the NCC and on the right coronary cusp. TEE showed 2 mobile echo densities on the AV, a 5-mm mass on the commissure of the left coronary cusp/right coronary cusp, and a 1-cm mass attached to the aortic side of the NCC. The patient underwent successful robotic resection of both masses (Figure 6, A and B).

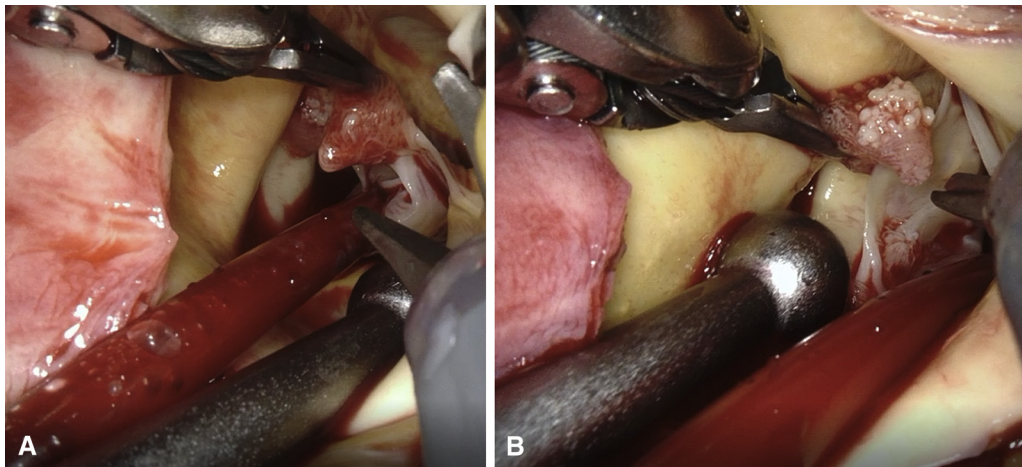
Crossclamp time was 57 minutes. The patient was extubated in the OR, chest tube was removed POD 1, and she was discharged home POD 2 (Table 1).

### CONCLUSIONS

In this series, all patients underwent successful total endoscopic resection of AV PFEs, with no perioperative complications and a short length of stay. Our institutional review board approved the study (s22-00055). At follow-up, all patients were asymptomatic and without evidence of recurrence. A totally endoscopic approach has been shown to be successful in the management of AV PFE in case reports and small series.<sup>5,6</sup> In a series of 5 patients, Nisivaco and colleagues<sup>6</sup> showed similar results with curative resection, no morbidity or mortality, and durable results at 24 months. Totally endoscopic resection is a feasible, safe, and effective approach for the surgical management of AV PFE. This minimally invasive approach makes surgical resection more easily acceptable for patients.



**FIGURE 4.** Transesophageal echocardiography with 7-mm mass on aortic side of the noncoronary cusp.



**FIGURE 6.** A, Papillary fibroelastoma measuring 5 mm on the commissure of the left/right coronary cusps. B, Papillary fibroelastoma measuring 1 cm attached to the aortic side of the noncoronary cusp.

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