SCIENTIFIC LETTER

TRANSAXILLARY APPROACH FOR RESECTION OF FIBROELASTOMA OF THE AORTIC VALVE: A MINIMALLY INVASIVE STRATEGY

ABSTRACT

We describe the case of a 78-year-old female patient with a history of anticoagulated atrial fibrillation and overweight, admitted for resection of a fibroelastoma of the aortic valve using a minimally invasive right transaxillary approach.

Keywords: *fibroelastoma, transaxillary approach, aortic valve.*

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INTRODUCTION

Fibroelastomas are the second most common primary cardiac tumor in adults[1]. Approximately 30% of patients with papillary fibroelastomas are asymptomatic and diagnosed incidentally. Elective surgery is recommended to avoid embolic events. We present the case of a patient with resection of an aortic valvular fibroelastoma using a minimally invasive transaxillary approach.

CLINICAL CASE

A 78-year-old female patient with a history of anticoagulated atrial fibrillation, overweight, and a former smoker was admitted electively for resection of an aortic valve fibroelastoma. The tumor was diagnosed incidentally through a transesophageal echocardiogram (TEE), which revealed an echogenic image of well-defined borders, mobile, sized 0.7 cm x 1.7 cm, associated with the left coronary leaflet, compatible with a pedunculated fibroelastoma. The left ventricular function was preserved, and there were no signs of aortic valve insufficiency.

RIGHT TRANSAXILLARY MINI-INVASIVE ACCESS

Before performing this approach, it is essential to perform a chest computed tomography scan with contrast to visualize the aortic valve plane, which should be in a 45-degree orientation, and to draw a line over the intercostal space (ICS) in which it is best located, which is almost always the third.

To ensure adequate support, the patient was positioned with the right upper limb elevated in a position similar to that of a "javelin thrower" (*Figure 1A*). The patient was positioned as close to the stretcher's edge as possible, and support was used to elevate the right hemithorax. External defibrillation templates were placed as part of the standard protocol for patients undergoing minimally invasive surgery.

Lines were drawn over the anterior axillary line and the third right ICS (*Figure 1B*). The intersection point was used as a reference for a vertical incision hidden under the arm for a better esthetic result.

A 4-cm mini-thoracotomy was performed in the third ICS. For transaxillary miniinvasive aortic valve surgery, no additional ports for trocars or chambers were required, except for the initial placement of a right pleural drainage tube connected to the carbon dioxide. Long instruments for mini-invasive surgery (Geister™) and long knotters were used. Long arterial and venous cannulae (Edwards™ or Medtronic™) were introduced through a minimal incision (3 to 4 mm) into the femoral artery and vein, with a TEE-guided and controlled position. This step is crucial, and we should not continue until the cannulae's correct positioning is ensured.

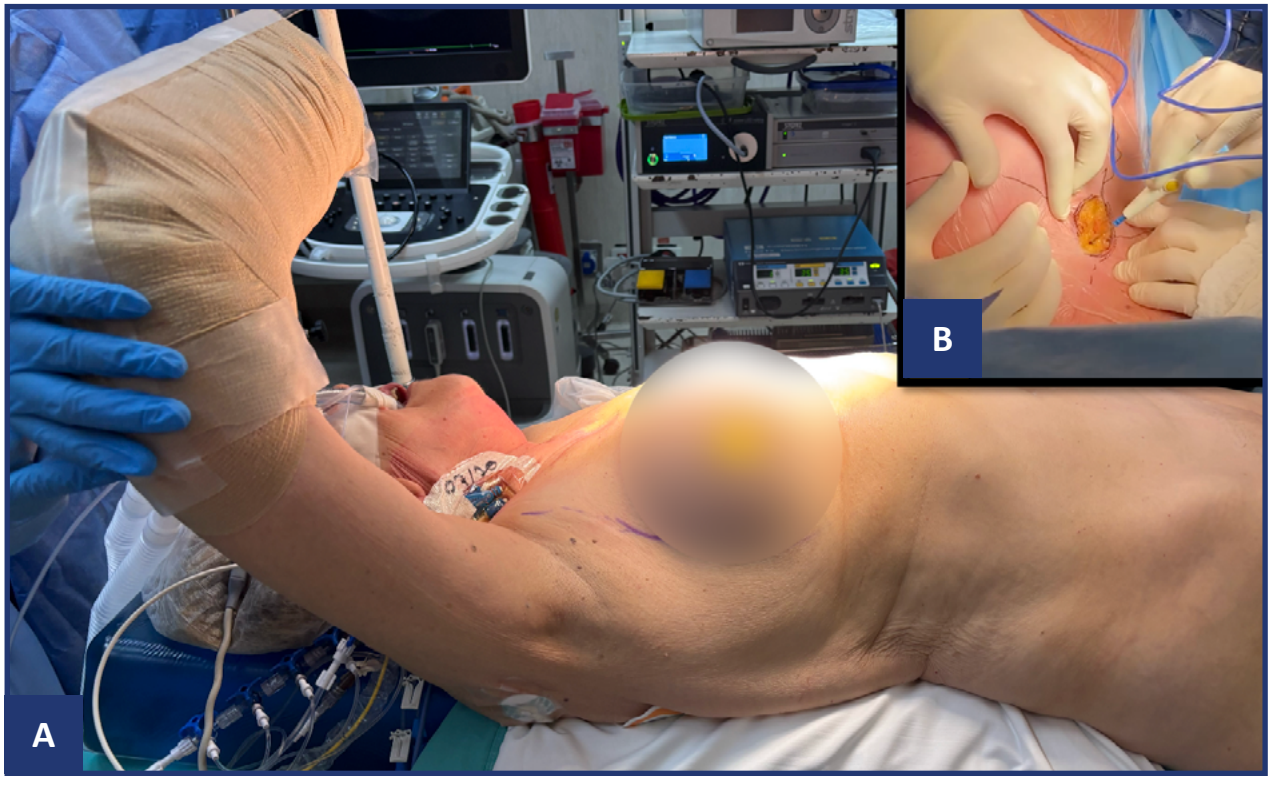

FIGURE 1. A. Positioning in "javelin thrower". **B.** Point of intersection between the anterior axillary line and the right-third intercostal space.

Bretschneider™ cardioplegia was used in a single dose of 2000 ml, although a Del Nido™ solution could be considered. Once the necessary flow was achieved and ventilation was deactivated, the thoracic cavity was entered with a mini-invasive intercostal retractor and an Alexis-type tissue retractor, and the pericardium was opened as far away as possible from the phrenic nerve. Approximately six traction points were placed radially. The intercostal retractor could be removed, and the aorta, right atrium, and right superior pulmonary vein should be adequately visualized (*Figures 2A* and *2B*). A traction point was used to ensure that the right atrial appendage did not hinder visualization. The right atrium must be empty for correct visualization. The rigging was started over the right superior pulmonary vein to place the left ventricular aspirator, and proper positioning was corroborated with TEE (advice: do not advance until these last two points are resolved). Laterally, a long aspiration needle was placed over the ascending aorta to ensure its control. A hinged aortic clamp was used; it is essential to consider the pulmonary artery and the left atrial appendage when positioning it to avoid complications (there may be lesions during clamping that are only noticed when the clamp is removed, which may require conversion to complete sternotomy). During the initiation of cardioplegia, it is recommended to stop for a moment and verify with TEE that there is no leak through the clamp to ensure complete clamping.

A transverse aortotomy was performed below the sinotubular junction, with traction points in the aorta as usual. The fibroelastoma implanted in the left coronary leaflet was observed and resected with shaving technique without difficulty (*Figure 2C*). The aorta was then closed with a double 4.0 polypropylene suture (before removing the clamp, epicardial pacemakers are placed in the right ventricle; otherwise, it will be difficult to position them correctly with the heart distended). The clamp was removed and continued in extracorporeal circulation; perfusion was reduced until the pump was stopped. After confirming with TEE the absence of fibroelastoma and bubbles in the heart, extracorporeal circulation was briefly restarted to remove the suction cannula from the left ventricle and add another point of hemostasis. After securing hemostasis, decannulation, and plane closure continued. For postoperative pain control, an intercostal catheter placed below the serratus muscle plane was used for continuous infusion of bupivacaine for the first 24 to 48 hours to improve postoperative comfort and reduce the need for analgesics and opioids (*Figure 2D*).

The patient had a favorable postoperative course, was immediately extubated, ambulated on the second day, and was discharged from the hospital on the fifth day after reaching the necessary anticoagulation range due to her atrial fibrillation.

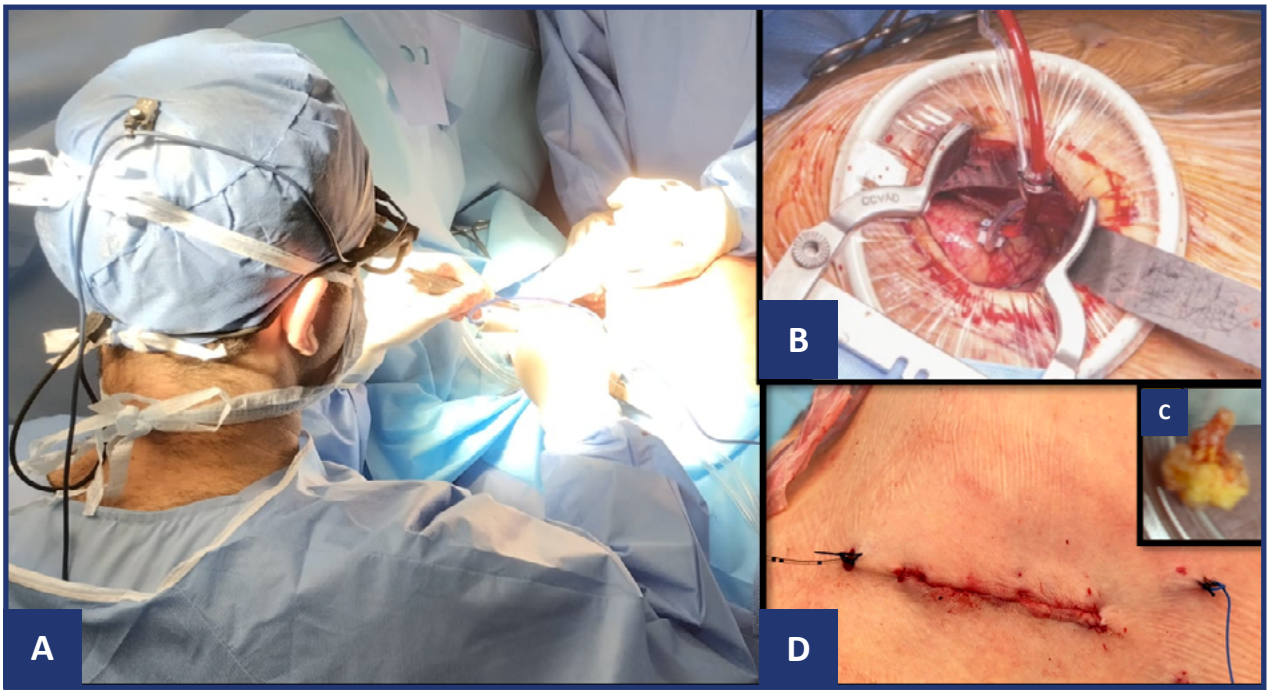

FIGURE 2. A. Surgeon's position. **B.** Set-up with intercostal and tissue retractor; direct visualization of the aorta. **C.** Resected fibroelastoma. **D.** Final scar with the arm still raised; intercostal analgesia catheter at the cephalic level and epicardial pacemaker lead at the caudal level can be seen.

COMMENTS AND DISCUSSION

Resection of aortic valvular fibroelastosis is recommended in patients who have suffered embolic events or complications related to tumor mobility (such as occlusion of the coronary ostium), as well as in patients with highly mobile or large tumors (≥1 cm)[1-3]. To date, there are no national publications on the resection of this tumor using a minimally invasive transaxillary approach. This technique is reproducible and suitable for treating aortic valve pathology. By avoiding sternotomy, patients have a more favorable postoperative period, with less trauma, less risk of infection, and better aesthetic results since the only visible scar is in the axilla.

Declarations

The authors declare no conflict of interest.

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