Case report - Thoracic general

Video-assisted thoracoscopic epicardial ablation of left pulmonary veins for lone permanent atrial fibrillation

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Received 5 July 2006; received in revised form 14 September 2006; accepted 18 September 2006

Abstract

Permanent atrial fibrillation necessitating oral anticoagulation may lead to deleterious consequences in patients with severe comorbidity factors. We present the case of a 68-year-old female patient with a lone permanent atrial fibrillation disclosed five years earlier, necessitating anticoagulation with coumadin and treated for a lymphoma by chemotherapy. Due to hematological consequences resulting from chemotherapy and oral anticoagulation, the patient presented with regular hemotorax and anemia. The need to suppress oral anticoagulation became obvious and the decision to treat the atrial fibrillation was discussed through a video-assisted thoracoscopic radiofrequency epicardial isolation of pulmonary veins.

Keywords: Atrial fibrillation; Oral anticoagulation; Thoracoscopic pulmonary vein isolation; Radiofrequency

1. Introduction

Surgical treatments of permanent atrial fibrillation (AF) with valvular or coronary disease developed since initial reports by Cox [1], emphasized by developments of new procedures among which radiofrequency, gained popularity and demonstrated obvious rhythmologic benefits.

Surgical management of lone AF remains more controversial since roles of medical and pharmacological therapies to restore and maintain sinus rhythm [2], or to reduce incidence of stroke are reasonably well-established [3]. Among curative approaches, catheter ablation is the main procedure [4]. However, this concept requires cardiologists with a specific skill, and the duration of the procedure as well as the risk of stroke do not yet contribute to a wide propagation. We report the case of a patient in whom lone permanent AF was successfully treated by means of video-assisted thoracoscopic epicardial radiofrequency. Technical details and perspectives are discussed.

A 68-year-old female patient was referred to our institution with a severe hemothorax resulting from an overanticoagulation, with coumadin prescribed for a permanent lone AF disclosed five years earlier and refractory to at least five attempts of cardioversions despite amiodarone treatment. Additionally, this patient was treated for a lymphoma with a good response to chemotherapy.

Laboratory study confirmed an anemia (Hb: 7.6 g/l) and international normalized ratio (INR) was six. Due to difficulties to stabilize INR emphasized by pharmacological interferences with chemotherapy and in order to restore a sinus rhythm, a video-assisted thoracoscopic drainage associated with an epicardial radiofrequency isolation of the left pulmonary veins (PVs) was considered. Furthermore, the poor perceived health status of the patient led us to defer an additional isolation of right pulmonary veins. Preoperative echocardiography assessed impairment of LVEF (45%) and left atrial size was 42 mm.

Following a right selective pulmonary intubation, the patient was placed in a right lateral decubitus position. A 5-mm port was used to insert through the 8th intercostal space, the optical system (Karl Storz, Tuttlingen, Germany) on the middle axillary line. Two additional trocars were inserted through the 5th and 6th intercostal spaces along the anterior axillary line. Two additional trocars were inserted through the 5th and 6th intercostal spaces between the phrenic nerve and the pericardial incision was enlarged to visualize left appendage and PVs. Once dissection of the PV-atrial junction was completed, a lace was positioned around the left PVs and fixed to the distal extremity of a Cobra Flex* radiofrequency flexible probe (Boston Scientific-EP Technologies) previously inserted in the thorax through a port. Then, a gentle traction on the lace guided the probe to the posterior side of the left PVs (Fig. 1).

After connecting the probe to the power generator and selecting appropriate parameters (100 Watts; 70 °C; 120 s), radiofrequency ablation was performed around the pulmonary veins (Fig. 2). Additional ablation was completed on...
the left appendage. Duration of the procedure was 63 min. Amiodarone was infused immediately after the operation (900 mg/day) with oral prescription at the second postoperative day (600 mg/day) for at least three months. Sinus rhythm was restored on the 5th postoperative day.

The patient was discharged in sinus rhythm with low-molecular-weight heparin (enoxaparin: 4000 U/day) and aspirin (160 mg/day). At the third postoperative month, Holter monitoring assessed a stable sinus rhythm. Consequently, amiodarone was discontinued and no complementary right PV ablation was required. At 24 months the patient remains in sinus rhythm with an efficient atrial contraction and no thrombus within the left atrial cavity.

2. Discussion

Atrial fibrillation (AF), whose prevalence ranges around 6% in the population older than 65 years of age, remains the most frequent cause of stroke in the elderly [5] and increases the risk of death [6]. Permanent or paroxysmic AF associated with valvular or coronary artery disease is now treated by cardiac surgeons since several publications reported interesting rhythmologic results either with the Cox-maze procedure [1] or with radiofrequency ablative approaches [7]. On the other hand, therapeutic approaches of lone AF remain limited to pharmacological drugs [2] or catheter ablative procedures [4] with controversies related to specific technical demands and complications. Minimally invasive surgery may be an interesting option for a curative approach of lone AF by means of epicardial ablation. Implication of PVs is well-established [8,9] and particularly left PVs [10]. Consequently a video-assisted thoracoscopic radiofrequency ablation of PVs may be assessed as an alternative option to catheter ablation.

We believe that thoracic surgeons who are familiar with thoroscopic approaches regularly face patients with permanent lone AF and should consider an epicardial PV ablation, either as a curative whole procedure in the case of lone AF or as a complementary step to be integrated with a video-assisted thoracoscopic treatment of a pleural or pulmonary disease.

However, debate about whether performing ablation of both right and left PVs in the same operation rather than delaying an additional ablation of the contralateral side according to rhythmologic results, deserves discussion. Due to unavailable mapping to consider a guided ablation [9], we believe that both sides should be simultaneously treated to increase rhythmologic success and new devices have been recently developed for that goal. However, in our case and despite a long history with permanent AF, we hypothesized that compression of left PVs by hemothorax was a major factor to sustain AF. Therefore, performing drainage of pleural effusion with an additional left PVs ablation and delaying radiofrequency of the right PVs seemed to be the adequate option reinforced by the status of the patient and Harada’s report [10].

In conclusion, this approach demonstrated feasibility, safety and effectiveness and should be considered by thoracic surgeons as a possible alternative option to catheter ablation.

References


