

The management of fast-track cardiac anesthesia in a patient with right atrial myxoma

Sağ atriyal miksomalı bir hastada hızlı derlenme kardiyak anestezi uygulaması

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The incidence of primary cardiac tumors is low, accounting for only 0.3% of all open cardiac operations. Atrial myxomas are the most common type of primary cardiac tumors, and they may progress to life-threatening symptoms when they enlarge rapidly. Both pulmonary embolism and infective endocarditis are rare complications of right atrial myxomas. In this article, we report the anesthetic management of a patient with right atrial myxoma complicated by pulmonary embolism and infective endocarditis who was treated surgically with a fast-track cardiac anesthesia procedure during minimally invasive coronary artery bypass graft surgery.

Key words: Atrial myxoma; fast-track cardiac anesthesia; infective endocarditis; pulmonary embolism.

Atrial myxoma is the most frequent cardiac benign tumor and is present in approximately 0.0017%-0.33% of autopsy series. Right atrial myxomas are rare and occur three to four times less frequently than left atrial myxomas.^[1]

Pulmonary embolism and infective endocarditis are two rare complications of right atrial myxomas. The literature contains only a few reports concerning these complications and their anesthetic management.^[1,2] In our case report, we discuss a patient who had right atrial myxoma complicated by pulmonary embolism and infective endocarditis. He was treated surgically with a fast-track cardiac anesthesia (FTCA) protocol.

Primer kalp tümörlerinin insidansı düşük olup, tüm kalp ameliyatlarının yalnızca %0.3'ünü oluşturlar. Atriyal miksomalar primer kalp tümörlerinin en sık görülen tipidir ve bunlar hızlı büyüdüklerinde yaşamı tehdit eden semptomlar geliştirebilir. Pulmoner emboli ve infektif endokardit, sağ atriyal miksomanın nadir komplikasyonudur. Bu yazıda pulmoner emboli ve infektif endokardit ile komplike olmuş sağ atriyal miksomalı hastaya minimal invaziv koroner arter baypas greft cerrahisi sırasında uygulanan hızlı derlenme kardiyak anestezi işlemi ve anestezi yönetimi sunuldu.

Anahtar sözcükler: Atriyal miksoma; hızlı derlenme kardiyak anestezi; enfektif endokardit; pulmoner emboli.

CASE REPORT

A 39-year-old man presented with a one-week history of chest pain, fever, and bloody sputum. His heart rate (HR) was 110 beats/min, his oxygen saturation (SpO₂) level was 92%, and his temperature was 38° Celsius. Breathing sounds were not heard in the left lower part of the lung, and there was a diastolic murmur on the right side of the sternum. Pulmonary embolism was confirmed by thoracic computed tomography (CT) (Figure 1). At first, an anticoagulation therapy of enoxaparin sodium 2x 0.8 subcutaneously (sc) and coumadin 5 mg peroral (po) was given, but only the enoxaparin sodium 2x 0.8 was continued for three days until the operation was performed.



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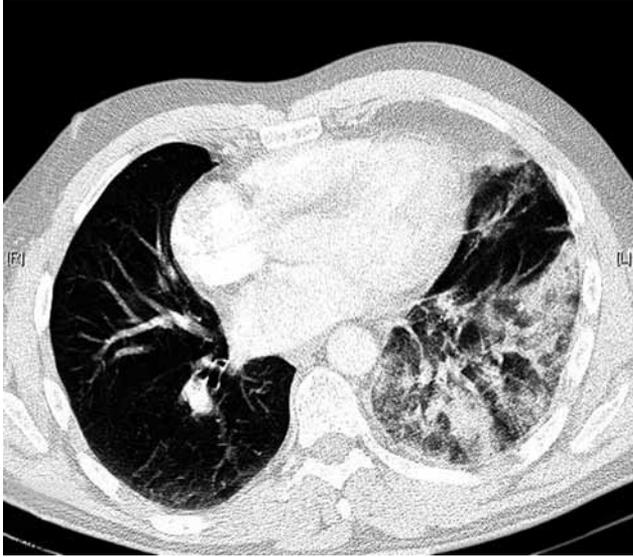


Figure 1. Computed tomography image showing the consolidation area at the left pulmonary basal lobe related to the obstructed left pulmonary artery emboli.

The international normalized ratio (INR) was evaluated regularly. A right atrial mass measuring 2.4x1.7 cm was diagnosed by transthoracic echocardiography (Figure 2). The diagnosis of the infected atrial myxoma was made by blood cultures in which *Staphylococcus aureus* was isolated. An antibiotic treatment composed of levofloxacin 1x 750 mg and vancomycin hydrochloride (HCl) 2x 1 g was started. Three days after the

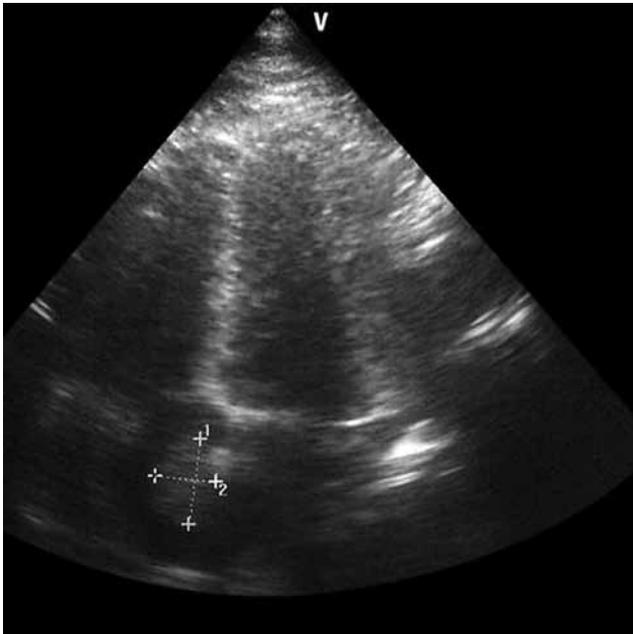


Figure 2. Transthoracic echocardiography showing the right atrial myxoma.

initial diagnosis, the size of the myxoma was enlarged when viewed with transthoracic echocardiography. It appeared to arise from the intraatrial septum and it was estimated to be 3.2x1.8 cm. The patient had undergone a normal echocardiography as part of a routine check-up one year before his arrival, and the results had been normal. The laboratory results also had been normal at that time.

Preoperatively, 0.03-mg/kg intravenous (i.v.) midazolam was given to the patient, and a skin incision 6 cm in length with a partial lower sternotomy (T sternotomy) (Figure 3) was urgently planned with cardiopulmonary bypass (CPB) under general anesthesia while continuing the antibiotic treatment. The electrocardiography (ECG), HR and SpO₂ levels were monitored non-invasively, and a radial artery catheter was inserted to check the invasive arterial blood pressure. Anesthesia was induced with a bolus dose of remifentanyl 1 µg/kg i.v. injected over 30 seconds and a continuous infusion of remifentanyl started at a delivery rate of 0.1-0.5 µg/kg/min i.v.. Etomidate 0.2 mg/kg i.v. was given for hypnosis, and vecuronium 0.1 mg/kg i.v. was used to facilitate endotracheal intubation. During the maintenance of anesthesia, isoflurane was given at 0.5-1% in combination with 50% in air at 4L/min. Ultrasound-guided central venous cannulation of the right internal jugular vein was also carried out on the patient. The heparinization, CPB period, excision of the myxoma, weaning from CPB, and reversal of heparin with protamine were similar to other cardiac anesthesia protocols.

An excision of the 2x4 cm-sized right atrial myxoma with interatrial septum was performed. A histopathological examination confirmed the tumor

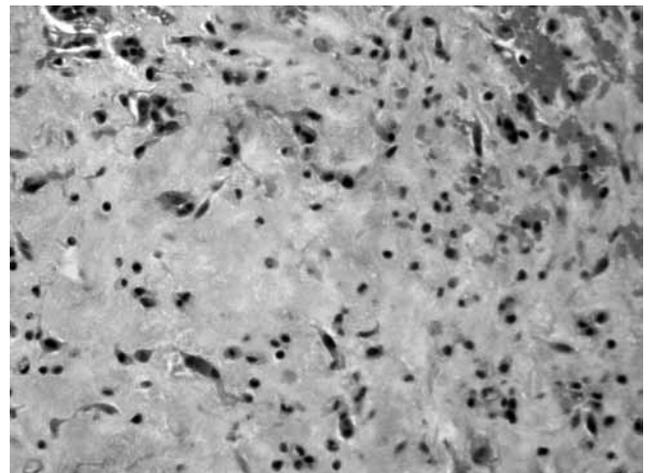


Figure 3. Cardiac myxoma characterized with ovoid and stellate-shaped benign myxoma cells in myxoid fibrous stroma (H-E x 200).



Figure 4. Mini skin incision measuring six centimeters in length.

etiology as a myxoma (Figure 2). After the operation, the patient was transferred to the intensive care unit (ICU) without extubation and sedated by midazolam 2 mg i.v.. He was weaned from mechanical ventilation as soon as there was a response to verbal stimuli, normothermia, and hemodynamic stability along with satisfactory blood loss (<100 ml/h). Tracheal extubation occurred when the patient was awake and cooperative with a respiratory rate of 14 breaths/minute and a satisfactory arterial blood gas analysis. The postoperative period was uneventful, and the patient was extubated in the first postoperative hour. Postoperative analgesia consisted of i.v. tenoxicam 2x20 mg and morphine 1 mg. All hemodynamic parameters and laboratory findings were within normal limits on the first postoperative day. On the second postoperative day, the patient was discharged from the ICU, and he was released from the hospital asymptotically three days after the operation.

DISCUSSION

Atrial myxomas are often presented by the triad of embolization, obstruction of blood flow, and constitutional symptoms. Embolism appears significantly more often in patients with infected atrial myxomas, which probably makes it even more fragile and friable.^[1]

Anesthetic management of the atrial myxoma excision is mostly the same as with other cardiac surgery anesthesia protocol, but special care must be taken at certain points. The nature of the management depends on the size and location of the tumor. Anesthesiologists should also provide special care in cases of right axial myxomas when central venous catheterization is performed. Being aware of myocardial ischemia is

also necessary because tumor emboli to the coronary arteries can occur during the operation. The surgeon must manipulate the heart as gingerly as possible during venous and arterial cannulation. Anesthetic management in patients with right atrial myxoma also includes avoidance of hypoxemia, hypercarbia, acidosis, and lung hyperinflation. Premedication is vital for preventing anxiety-associated tachycardia and atrial dysrhythmias. Our patient was sedated and calm when he entered to the operation room.^[3]

Fast-track cardiac anesthesia is the goal for cardiovascular surgery in our clinic. In an attempt to decrease the cost of cardiac surgery, fast-track programs have become increasingly popular. Early extubation plays a significant role in FTCA. Potential benefits of early extubation include the rapid normalization of ciliary function, an earlier ability to cough, a reduction in the risk of atelectasis, and the correction of intrapulmonary shunt fraction. Cheng et al.^[4] and Reis et al.^[5] reported on the safety and efficacy of early extubation. The most important step is the use of minimal doses of (or the titration of) short-acting opioids with inhalation anesthetic agents. The potential advantages of inhalation anesthetic agents (isoflurane) in patients receiving cardiopulmonary bypass (CPB) have been demonstrated as it has become more popular. These agents have been shown to have cardioprotective effects and also provide protection against reperfusion injury and myocardial ischemia. We used isoflurane during anesthesia maintenance with no hemodynamic instability.^[3,6] We preferred remifentanyl as an opioid because it provides effective analgesia, suppresses stress response, and supplies an early recovery of ventilatory functions. Lison et al.^[7] and Howie et al.^[8] reported that remifentanyl facilitated an earlier tracheal extubation than sufentanyl.

In the postoperative period, pain management is essential after CPB surgery when a minimally invasive open heart surgery procedure would be advantageous for pain control. Inadequate pain control may cause tachycardia or supraventricular dysrhythmia. We successfully controlled the pain in our patient with morphine and nonsteroidal anti-inflammatory drugs (NSAIDs).

In conclusion, cardiac myxoma presents with a low incidence and usually develops in conjunction with cardiovascular and constitutional symptoms. Pulmonary embolism is a rare complication of right atrial myxoma. In a patient with embolism, it is necessary to perform echocardiography as soon as possible as any delay makes diagnosis difficult and postpones surgical treatment, thus causing a greater

risk for the patient. Early diagnosis and urgent surgical treatment is crucial to provide the best possible prognosis for the patient.

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