

Combined cardiac surgery and substernal thyroidectomy

Kombine kardiyak cerrahi ve substernal tiroidektomi

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Excessive growth of the thyroid gland is frequently associated with multinodular goiter. Shifting of mediastinal structures and large airway obstruction via extrinsic compression by a mass effect can lead to additional surgical problems. In November 2008, a 65-year-old male patient with unstable angina pectoris was admitted to our clinic for coronary artery bypass grafting. A retrosternal mass lying over the ascending aorta precluded cannulation. After the resection of retrosternal goiter, cardiopulmonary bypass was performed with single right atrial and ascending aortic cannulation. Combined cardiac surgery and thyroidectomy can be safely performed if the preoperative thyroid hormone levels are maintained in the euthyroid state.

Key words: Cardiac surgery; substernal goitre; thyroidectomy.

Excessive growth of the thyroid gland is frequently associated with multinodular goiter. Substernal enlargement was first described by Haller in 1979 and later defined by a thyroid mass in which over 50% is located below the thoracic inlet.^[1] Up to 11% of patients with cardiac disease also experience thyroid disease in patients.^[2] The shifting of mediastinal structures and large airway obstructions via extrinsic compression by mass effect can lead to additional surgical problems.^[3] Surgery for substernal goiter can be performed with a low morbidity and very low mortality.

CASE REPORT

In November 2008, a 65-year-old male patient with unstable angina pectoris was admitted to our clinic for

Tiroid bezinin aşırı büyümesi, sıklıkla multinodüler guatr ile ilişkilendirilir. Kitle etkisinin dışarıdan basısı yoluyla mediastinal yapıların ve büyük hava yolu tıkanıklıklarının kaydırılması, cerrahi sorunlara neden olabilir. Kasım 2008'de 65 yaşında bir erkek hasta kararsız angina pektoris yakınmaları ile koroner arter baypas greft cerrahisi için kliniğimize yatırıldı. Çıkan aortun üzerinde uzanan retrosternal kitle, kanülasyonu engellemekteydi. Retrosternal guatrın rezeksiyonunu takiben, tek sağ atriyal ve çıkan aortik kanülasyon ile kardiyopulmoner baypas yapıldı. Ameliyat öncesi tiroid hormon seviyeleri ötiroid olarak sağlandığında, kombine kardiyak cerrahi ve tiroidektomi güvenle uygulanabilir.

Anahtar sözcükler: Kardiyak cerrahi; substernal guatr; tiroidektomi.

coronary artery bypass grafting (CABG). His medical history was remarkable for hypertension and smoking with no previous surgical procedure. His physical examination was normal and did not show any goiter-related symptoms such as jugular venous dilatation or audible stridor. An electrocardiogram was normal. Chest radiography revealed a widened superior mediastinum (Figure 1). Computed tomography (CT) revealed a substernal mass lying over the ascending aorta which grew out of the isthmus part of the thyroid. A coronary angiogram showed a subocclusive lesion in the proximal and distal segments of the right coronary artery and circumflex artery and total occlusion of the proximal segment of the left anterior descending artery (LAD). Laboratory studies, including tests for T₃, T₄, and



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Figure 1. Preoperative chest radiography of the patient.

thyroxine, were all normal. The patient was brought to surgery on a standard anesthetic regiment, and a median sternotomy followed up the harvesting of the left internal mammarian artery (LIMA). A retrosternal mass placed over the ascending aorta prevented cannulation (Figure 2). The lower pole of the thyroid gland was dissected free from its retrosternal position and resected. The right and left lobes were explored



Figure 2. Goiter lying over the ascending aorta.

and found to be of normal size. The dimensions of the mass were 9x7x5 cm (Figure 3). Heparinization was achieved after hemostasis. Cardiopulmonary bypass (CPB) was performed with single right atrial and ascending aortic cannulation. Under CPB and moderated hypothermic arrest by antegrade cold blood cardioplegia, the patient underwent CABG. The LIMA was then anastomosed to the LAD, and a saphenous vein graft for the right coronary artery and circumflex artery was anastomosed in an end-to-side fashion using a running 7-0 suture. The patient was rewarmed and weaned off CPB without difficulty. The postoperative course was uneventful with no problems associated with either hyperthyroidism or hypothyroidism. A histopathological examination revealed multinodular goiter. Postoperative serum calcium, phosphorus, and thyroid tests were normal, and the patient was discharged on the seventh postoperative day.

DISCUSSION

Substernal goiters are mostly seen in the fifth decade of life and are found predominantly in women.^[1] In asymptomatic patients, diagnosis is generally established by preoperative chest radiographs or intraoperatively after a sternotomy. In our case, chest radiography revealed widened superior mediastinum which was also seen on CT. The timing of the thyroid surgery in patients who need major cardiac surgery is crucial. Performing a thyroidectomy after cardiac surgery increases the cumulative risk for the two separate operations, whereas performing it before cardiac surgery may increase the cardiac risk due to anesthesia.^[4]



Figure 3. Retrosternal thyroid mass.

Although reports of cardiac surgery combined with a thyroidectomy have rarely been published, managing both in a single-stage operation seems feasible.^[5] In fact, a single-staged operation combining cardiac surgery and a thyroidectomy has been previously reported in the literature, and there were no complications.^[4-6] Klemperer et al.^[7] reported that mean serum T₃ levels decreased by approximately 40% after the start of CPB. Patients with normal thyroid function after cardiac surgery have been reported to have a low cardiac output and elevated systemic vascular resistance, similar to that observed in hypothyroid patients, and approximately 50-75% of patients are in a 'euthyroid-sick' state for one to four days after surgery. Recurrent laryngeal nerve injury, hypocalcemia, hypoparathyroidism, and massive bleeding are other possible postoperative complications associated with the combined surgeries. Therefore, hormone levels in the early postoperative period have to be monitored to avoid any of these complications. In our case, preoperative and postoperative thyroid hormone levels were euthyroid. Because of the difficulty in approaching the ascending aorta for cannulation, a concomitant thyroidectomy was performed on our patient.

Combining cardiac surgery with a thyroidectomy in a single-staged operation is a safe procedure if the preoperative thyroid hormone levels are maintained in the euthyroid state.

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