

CASE REPORT

Perioperative management of combined coronary bypass surgery and thyroidectomy

Kombine koroner arter baypas cerrahisi ve tiroidektominin perioperatif yönetimi

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Summary– Significant swelling of the thyroid compromising the airway can be a challenging situation when combined thyroidectomy and cardiac surgery is planned. Induction, intubation, intraoperative management, and extubation require special attention in such cases.

Özet– Havayolunu riske atan büyük tiroit şişkinliği tiroidektomi ve kalp cerrahisi birlikte planlandığında güçlük yaratabilir. Bu olgularda endüksiyon, entübasyon, intraoperatif yönetim ve ekstübasyon özel dikkat gerektirir.

A large thyroid goiter may compress and deviate the trachea. This can lead to compromised airway and difficulty in tracheal intubation. Proper management of airway in thyroid goiter is always a challenge. This is particularly important when such patients are scheduled for combined cardiac and thyroid surgery. The timing of the thyroid surgery in patients who need major cardiac surgery is crucial. Doing thyroidectomy after cardiac surgery raises the cumulative risk for the two separate operations, whereas performing it before cardiac surgery may increase cardiac risk as result of anesthesia.^[1,2]

CASE REPORT

A 64-year-old male patient presented with unstable angina. Electrocardiogram suggested anterior wall myocardial infarction. Coronary angiography showed triple vessel coronary artery disease and echocardiography was suggestive of regional wall motion abnormality with left ventricular ejection fraction of 40%. Patient was referred for coronary artery bypass surgery (CABG). On preoperative anesthesia evaluation, patient was found to have swelling in neck that moved with deglutition. Patient denied any history of breathing or swallowing difficulty. There was no history

suggestive of hypo- or hyperthyroidism. Chest X-ray revealed significant deviation of trachea to right side (Figure 1). Computed tomography of chest showed large swelling (6 cm×6 cm×8.4 cm) in left lower cervical region extending into retrosternal space with marked compression and deviation of trachea (Figure 2). Under adequate local anesthesia, ultrasound-guided fine needle aspiration cytology was performed to rule out malignancy. Histopathological examination revealed colloid goiter with follicular cells. Thyroid function tests were normal. Plan was to perform thyroidectomy and CABG in the same surgical session. Securing airway during general anesthesia before surgery is important initial step. Considering the airway compression, it was essential to do preoperative diagnostic bronchoscopy under sufficient airway anesthesia with nebulized lignocaine to assess tracheal narrowing and any airway edema. Such preoperative evaluation enables anesthesiologist to plan safe and proper airway management.

Awake intubation was scheduled due to fear of difficult airway. All standard monitoring was ap-

Abbreviations:

CABG Coronary artery bypass surgery

CAD Coronary artery disease

FOI Fiberoptic intubation

Received: October 19, 2016 Accepted: December 14, 2016

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plied. Large bore intravenous cannula and radial arterial cannula to monitor blood pressure were inserted under local anesthesia. Injection of 0.2 mg glycopyrrolate was administered intramuscularly as an antisialagogue. Patient was given 4% lignocaine via gargles and nebulizer. Bilateral superior laryngeal nerve block and intratracheal 2% lignocaine through cricothyroid space was used to anesthetize airway. Videolaryngoscope (C-Mac; Karl Storz GmbH & Co. KG, Tuttlingen, Germany) was used to intubate with flexometallic 7 mm endotracheal tube. Intubation was achieved smoothly, with no hemodynamic instability. Air entry was bilaterally equal with no adventitious sounds. Patient was sedated and para-

lyzed following awake intubation. Off-pump CABG surgery using 3 venous grafts followed by hemithyroidectomy (after heparin reversal) was performed uneventfully. On postoperative day 1, patient was given T-piece trial. Long-term tracheal compression can potentially lead to tracheomalacia. Hence, bronchoscopy was performed to rule out tracheal collapse during spontaneous respiration. Extubation was done when patient was conscious, had good muscle power, respiratory effort, and hemodynamic stability. Patient did not have inspiratory stridor or breathing difficulty after extubation. Post surgery chest X-ray (Figure 3) demonstrated less tracheal deviation and narrowing.

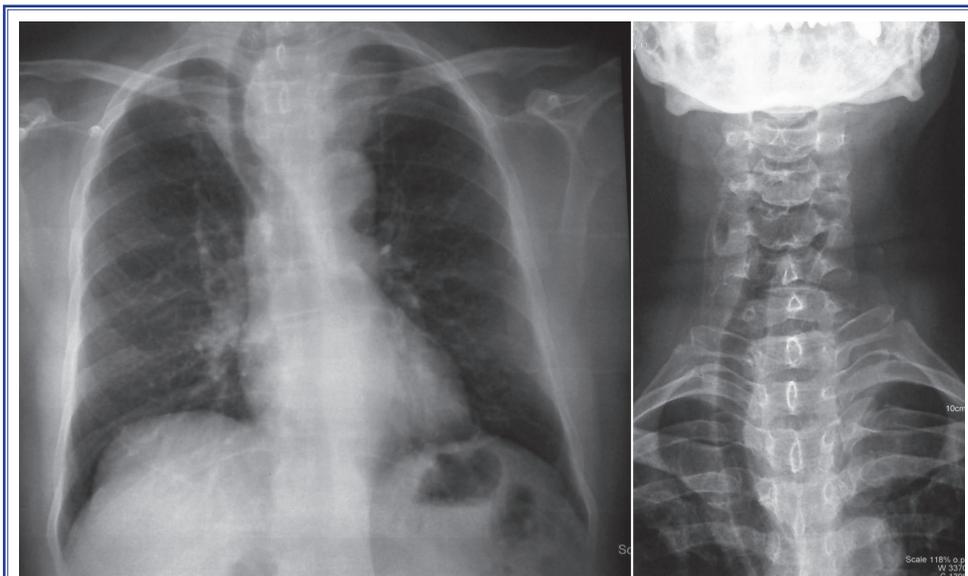


Figure 1. Preoperative chest X-ray and neck X-ray indicating tracheal deviation and narrowing.

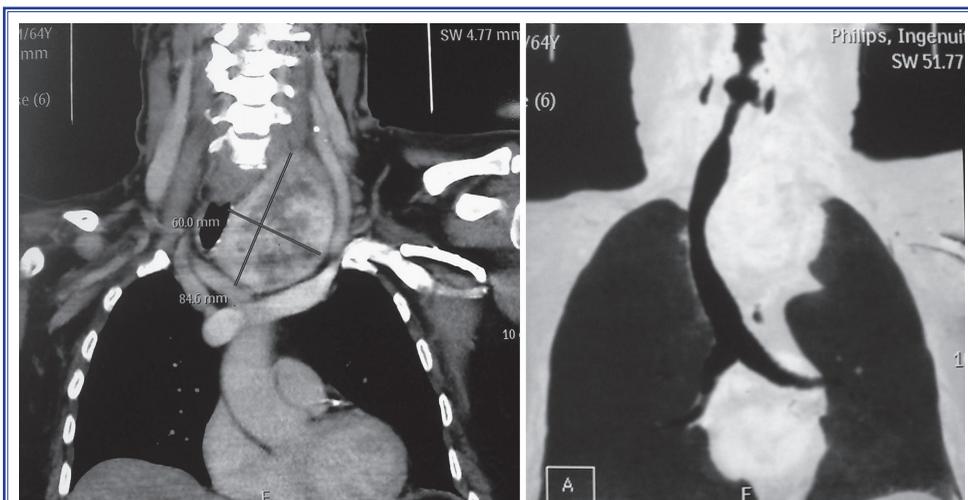


Figure 2. Computed tomography reveals mass with tracheal compression effect.

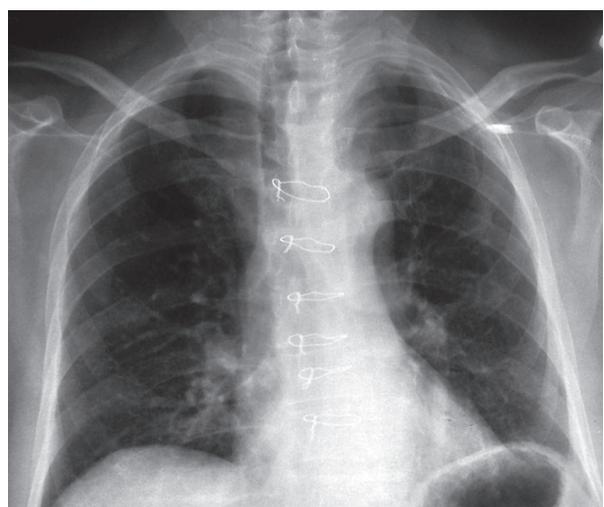


Figure 3. Postoperative chest X-ray showing less tracheal deviation.

DISCUSSION

CABG surgery in patient with substernal goiter should be planned carefully. In a patient with history of recent unstable angina or severe coronary artery disease (CAD), as in this case, hypoxia from difficult airway or catecholamine surge from thyroid disease may increase risk of perioperative acute myocardial ischemia.

To the best of our knowledge, combined surgery for goiter and CAD has only been reported by a few researchers in the literature.^[1-3] In all of these cases, thyroidectomy was performed first, with combination of collar incision and median sternotomy; however, in our case, off-pump CABG surgery was performed first and followed by thyroidectomy after heparin neutralization. Wexler et al.^[4] have suggested that thyroidectomy should be done before anticoagulation for CABG to minimize risk of bleeding. In our case, considering the unstable coronary lesion, it was decided to perform CABG first.

Performing thyroidectomy with cardiac surgery is rational, given anatomical relationship of the gland with the mediastinal cavity. Although the vast majority of retrosternal goiters can be removed through cervical incision, it is sometimes necessary to do a sternotomy, or at least a manubriotomy.

Sternotomy after cardiac surgery can be difficult due to adhesions. Coronary bypass grafts are at risk of damage in second sternotomy. Cagli et al. reported

case of patient with asymptomatic substernal goiter who underwent elective CABG, but wound up with tracheal obstruction postoperatively that required urgent thyroidectomy.^[5]

For these reasons, patients for cardiac surgery who may benefit from thyroid surgery for retrosternal goiter should be given the opportunity to discuss the merits of a single stage procedure.

Incidence of thyroid disease is 11% in patients with valvular disease or CAD.^[6] Thyroid dysfunction significantly influences cardiovascular physiology by affecting heart rate, stroke volume, and peripheral arteriolar reactivity. Hyperthyroidism can cause supraventricular tachyarrhythmia and increases myocardial oxygen consumption. Hypothyroidism decreases cardiac output and increases peripheral vascular resistance.^[7] Cardiopulmonary bypass can lead to state of acute hypothyroidism in the immediate postoperative period because of reduced triiodothyronine (T3) due to inhibition of peripheral deiodination of thyroxine (T4) to T3.^[8] Moderate hypothyroid status does not increase the risks associated with cardiac surgery and is not a contraindication for CABG.^[9] Cumulative risk of the combined surgery seems to be less than for two-stage procedure.^[10] Amiodarone, the class III antiarrhythmic drug, can cause thyroid dysfunction: hypothyroidism or even thyrotoxicosis. This is important, especially in perioperative setting.^[11]

The risk of thyrotoxicosis during thyroidectomy is low if the patient is in euthyroid or hypothyroid state before surgery, although thyrotoxicosis can be seen in euthyroid patients.^[1] In our case, we made sure patient's thyroid function was normal before surgery.

Proper airway management in a patient with large goiter in presence of CAD is always a challenge. Lacoste et al. reported that 6% of tracheal intubations for thyroid surgery should be expected to be difficult.^[12,13] Eldawlatly et al. visualized edema of supraglottic structures and edema of false vocal cords with nasal endoscope most likely due to obstruction of venous drainage caused by the huge goiter in a particular patient.^[14] Amathieu et al. reported overall incidence of difficult intubation in thyroid surgery of 11.1%.^[15] Voyagis and Kyriakos reported that goiter with airway deformity presents an aggravating factor for difficult intubation.^[16] Hariprasad and Smurthwaite reported successful airway management using awake fiber-

optic intubation (FOI) in a morbidly obese patient with gross supraglottic edema secondary to thyroid disease.^[17] Malhorta and Sodhi suggested a strategy with the following options for airway management of thyroid disease patient: inhalation induction with sevoflurane in the semi-supine or semi-sitting position, awake FOI, tracheotomy, or ventilation through rigid bronchoscope.^[18]

In present case, inhalation induction with sevoflurane was not preferred due to risk of airway collapse due to tracheomalacia; therefore, we used awake FOI. Mehta et al. used tracheal intubation via rigid bronchoscope in a patient with compromised airway who underwent combined off-pump coronary and thyroidectomy surgery.^[11]

Proper planning before surgery is important for safe outcome. Extubation in controlled atmosphere with all emergency airway equipment back-up is recommended in order to secure the airway if tracheal collapse occurs.

Conflict-of-interest: None declared.

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Keywords: Airway; coronary artery bypass surgery; thyroid.

Anahtar sözcükler: Havayolu; koroner arter baypas cerrahisi; tiroit.