

INTRATHORACIC GOITERS: A review of six cases İntratorasik guatrlar:Altı vakanın değerlendirilmesi

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Summary: Intrathoracic (i.e. mediastinal or substernal) goiter is an uncommon condition which is usually acquired. Intrathoracic goiters are benign masses found in the anterior mediastinum, although these can be malignant in nature. In our department, six patients with intrathoracic goiter were treated surgically during the last eight years. Their presenting clinical manifestations were a neck mass, dyspnea, palpitation, neck vein distention and dysphagia. Diagnostic evaluation was performed by chest x-ray, thoracic CT scan and ¹³¹I radionuclear scintigraphies. All but one of the patients underwent subtotal thyroidectomy through a transverse cervical incision plus sternal split. In one patient, only "collar" incision was needed for removal of mediastinal goiter (16.7 %). Postoperative complications included atelectasis, transient hypocalcemic tetany, pneumothorax and wound hematoma. Histopathological results of all resected masses were reported as "nodular colloidal goiter". The results of surgical management of intrathoracic goiters are excellent, as morbidity and mortality are minimal. Patients with mediastinal goiter can expect full relief of clinical manifestations secondary to these mediastinal masses

Key Words: Substernal goiter, Surgery

Intrathoracic goiter is an uncommon condition, which accounts for less than two percent of all goiters requiring thyroidectomy(1). Substernal goiter (i.e., "goitre plongeant" or retrosternal goiter) is a common cause of compression of adjacent structures and aberrant (congenital) goiter is rare, ranging in incidence from 0.2 to three percent of all intrathoracic goiters(2).

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Özet: Çoğunlukla edinsel olan toraks içi (yani mediastinal ya da substernal) guatr alışılmamış bir durumdur. Her ne denli malign bir yapıda olabilirse de, intratorasik guatrlar mediastende rastlanan benign kitlelerdir. Anabilim Dahamızda, son sekiz yılda intratorasik guatrlı altı hasta cerrahi olarak tedavi edildi. Klinik manifestasyonları, boyun kitlesi, dispne, çarpıntı, boyun ven distansiyonu ve disfaji idi. Tanısal değerlendirme göğüs radyografisi, toraks komputezize tomografisi ve ¹³¹I radyonükleer sintigrafıyla yapıldı. Hastaların biri dışında hepsine transvers servikal bir kesi ve sternal ayırmayla subtotal tiroidektomi uygulandı. Bir hastada, mediastinal guatrın çıkarılması için yalnızca "yakalık" kesisi gerekti(%16.7). Postoperatif komplikasyonlar, atelettazi, geçici hipokalsemik tetani, pnömotoraks ve yara hematomunu kapsıyordu. Rezeke edilen külenin histopatolojik sonuçları "nodüler kolloidal guatr" olarak bildirildi. İntratorasik guatrların cerrahi tedavisinin sonuçları mükemmeldir; minimal morbidite ve mortalite gösterir. Mediastinal guatrlı hastalarda bu mediastinal kitlelere sekonder klinik manifestasyonların tüümüyle düzelmeleri beklenebilir.

Anahtar Kelimeler: İntratorasik guatr, Cerrahi

The development of large multinodular substernal goiters in the rest of the world is still common while the overall incidence in North America has decreased with the routine use of iodized salt. The majority of mediastinal goiters are located usually in the right hemithorax, are large, benign masses found in the anterior mediastinum, although three to seven per cent can be malignant in nature(3,4). The presenting symptoms as dyspnea or neck vein distention usually relate to the compressive nature of the mass on nearby structures (3,5,6). Diagnostic evaluation should include chest x-ray and computed tomographic (CT) scan but needle

aspiration biopsy should be avoided because of its dangerous substernal location. On the other hand, fine - needle aspiration for diagnosis is not always possible and is rarely reliable (3,7). The treatment of intrathoracic goiters is surgical, as medical therapy is generally unsuccessful(3,7). Secondary substernal goiters can be removed via a "collar" incision, however partial / full sternotomy or thoracotomy in primary ones is necessary. Indications for sternotomy/ thoracotomy are very large posterior goiter, mediastinal blood supply, or carcinoma necessitating mediastinal dissection (5,7). In postoperative period, tracheomalacia secondary to prolonged compression of the trachea by the mass needs to be followed-up. The results of surgical management are excellent (3).

MATERIAL and METHODS

A total of three female and three male patients were included in this study. Their ages ranged from 27 to 67 years, the average being 36.3 years.

Preoperative evaluation consisted of chest roentgenography, CT scanning, thyroid function studies, electrocardiography and lung function studies, ¹³¹I scintiscanning, and indirect laryngoscopy. Chest roentgenograms were the most frequently used ones among other investigations ; CT proved to be the most useful study. Patients with dysphagia had esophagography with barium and no motility studies were performed.

Chest roentgenograms revealed either retrosternal (anterior intrathoracic) or posterior mediastinal masses (Figure 1).

All but one of the patients underwent subtotal thyroidectomy through transvers cervical incision plus sternal split. In one patient only "collar" incision was needed for removal of intrathoracic goiter (16.7 %).

RESULTS

All patients were aware of their goiters for eleven or more years before seeking medical attention. The most common symptoms and signs were

dyspnea (66.7%), a neck mass(100%) (Figure 2) palpitation (66.7%) and dysphagia (50%)(Table 1). Computed tomographic scans of the chest demonstrated mediastinal masses in continuity with the cervical thyroid (Figure 3). ¹³¹I radionuclear scintigraphies were studied only in three patients (Figure 4). In all but one of the patients, results of serum thyroid function tests were normal. In three patients, lung function studies showed mild obstructive and restrictive lung disease. One patient had previously undergone thyroid lobectomy. Postoperative complications included atelectasis (33.3 %), transient hypocalcemic tetany (18.7 %), pneumothorax (16.7%), and wound hematoma (16.7%).

All patients were discharged between seven and ten days. Histopathological results of all resected masses were reported as " nodular colloid goiter".

Dilated cervical veins of three patients were collapsed on the fourth day after thyroidectomy.

Table I. Initial symptoms and signs of six patients with intrathoracic goiters.

Symptoms and signs	% of pts.
Neck mass*	100.0
Dyspnea	66.7
Palpitation	66.7
Dysphagia	50.0
Neck vein distention	50.0
Vertigo	33.3
Tremor & perspiration of hands	50.0
Fatigue	33.3
Exophthalmus	18.7
Weight loss	16.7

*Diffuse cervical thyroid enlargement without nodularity

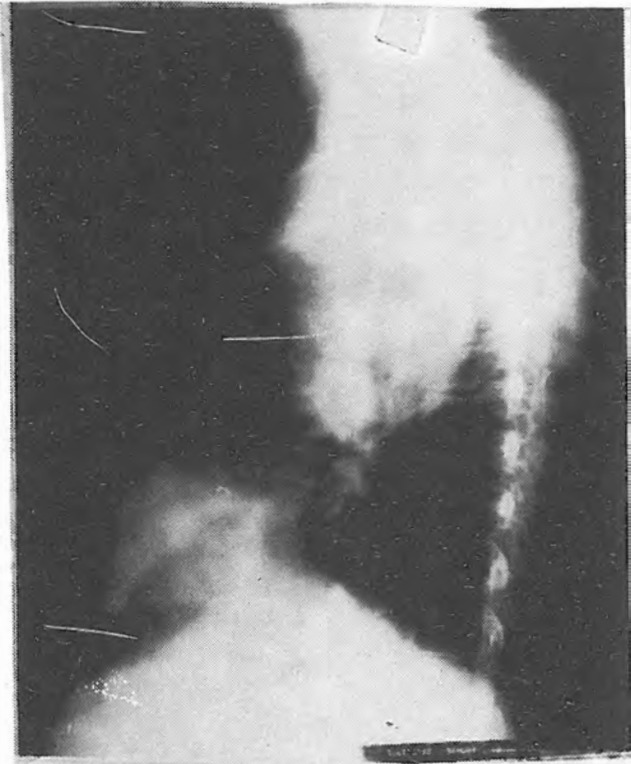


Figure 1. Lateral chest roentgenogram of large posterior mediastinal goiter

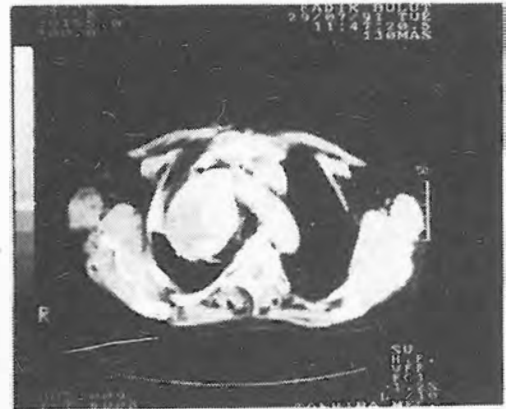


Figure 3. Computed tomography of the chest demonstrating the mediastinal mass causing moderate tracheal compression and deviation

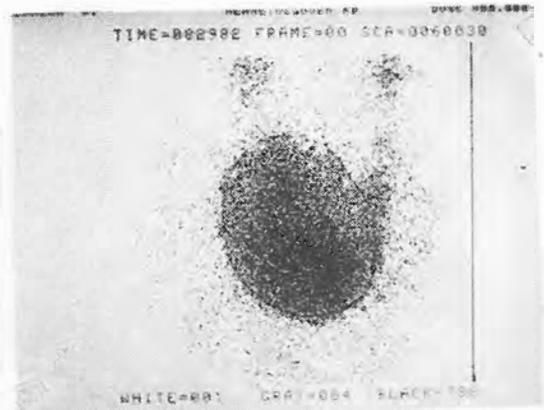


Figure 4. Scintigram of a patient with intrathoracic goiter



Figure 2. A photograph of 67 year-old female with goiter extending from the neck to posterior mediastinum

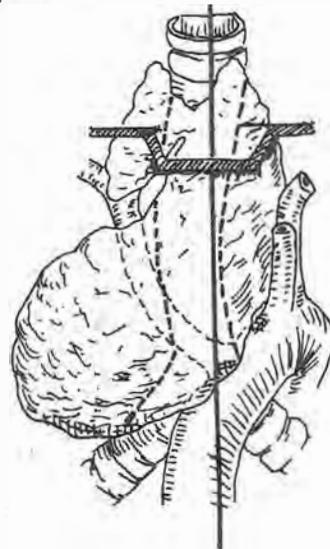


Figure 5. Anterior intrathoracic goiter

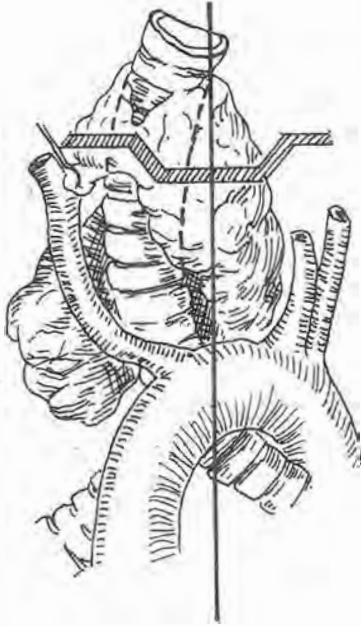


Figure 6. Posterior intrathoracic goiter

DISCUSSION

The incidence of intrathoracic goiters in some series of thyroidectomy patients was between 1.7 and 13.5 percent (8,9).

Half of the patients with intrathoracic goiter are asymptomatic; half of them have at least one compressive symptom (4,9,10).

Hyperthyroidism, tracheal compression, frequent upper respiratory tract infections, dyspnea, a cervical mass, superior vena cava syndrome and Horner's syndrome may be present in a patient with intrathoracic goiter (4,11). Thyrotoxicosis rarely occurs in patients with intrathoracic goiters however, if it does, it is due to Graves disease.

In patients with large intrathoracic goiters, apathetic hyperthyroidism should always be considered (4,8).

It is reported that there are not good alternatives to the surgical management of intrathoracic goiters associated with hyperthyroidism (4,8).

One of the few non-malignant causes of the superior vena caval syndrome including significantly dilated veins in the neck and the upper chest is intrathoracic goiter. In our series, this rate was 50 percent as compared with 10 percent elsewhere(8). Most authors (12) agree that, this complication is an absolute indication for operation, since operation is associated with complete reversal of the superior vena cava syndrome.

It may be very difficult to rule out malignant process in an intrathoracic goiter. There are "cold" areas on scanning in multinodular goiters(8).

In our series, surgical management was associated with minimum morbidity, no deaths, and significant improvement of symptoms in all patients. We did not encounter with cases in which "tracheomalacia" had occurred.

Reasons for treating intrathoracic goiters surgically are as follows:

1. Ineffective medical treatment,
2. Respiratory compromise, thyrotoxicosis, dysphagia, or malignancy developing in long-standing goiters.
3. Substernal lesions not accessible to needle biopsy,
4. Easy removal through a cervical incision with minimal morbidity nearly in all cases (8).

We conclude that an intrathoracic goiter is an indication for thyroidectomy.

The usual intrathoracic goiter lies within the anterior mediastinum in front of the trachea and great vessels, and it may produce compression of the trachea, the oesophagus, and the vessels from either before, backward, or obliquely, at the level of the thoracic inlet. The usual (anterior) type of intrathoracic goiter is illustrated in Figure 5 (6,13).

A substernal goiter, which is far more common than truly intrathoracic goiters, is called as intrathoracic goitre or "goitre plongeant". The surgical technique is essentially same with a routine

thyroidectomy. The large "solid" variety of substernal goiter may produce severe pressure on the trachea in a patient with a short, thick neck. Over a long period of time, this can produce a "tracheomalacia", softening of the tracheal cartilages to such extent that tracheal collapse may occur either at operation or subsequently since the supporting effect of the thyroid is removed.

Indications for elective surgical removal of intrathoracic goiter are; preventing compressive loss of the tracheal airway, the development of superior vena cava syndrome or esophageal obstruction, the substantial change of malignancy in 15-17% of cases, and the safety of resection (7,8,10)

Sternotomy may be required in removing a large and adhered intrathoracic goiter. However, Lahey's maneuver described many years ago may be employed in dealing with the usual type of non-toxic nodular intrathoracic goiter. For this reason, the finger is inserted into the top of such a mass, breaking it up and removing enough of its contents so that the intrathoracic component can be compressed and delivered into the neck through the thoracic inlet. The risk of hemorrhage from this procedure is minimal. The morbidity and mortality are low also after sternotomy(2,13).

Perpetuation of the misconception that the majority of intrathoracic goiters are anteriorly located mediastinal masses results from the inclusion of cervical goiters with moderate substernal extension into many clinical series describing this process(1,14).

Posterior mediastinal goiter arises from the posterior aspect of the gland and extends as it enlarges downward into the chest behind the carotid sheath. In about 75 percent of this type of intrathoracic goiter which is not common, the downward extension is on the right side between the sheath and the trachea. Review of the literature reveals that this position is a more common location for truly intrathoracic goiters than is generally recognized (1,14,15). Figure 6 illustrates a posterior mediastinal goiter(13). In those instances in which the gland lies low in the neck, the goiter

may be entirely intrathoracic although usually there is a sizeable cervical component. Expansion downward produces deviation of the trachea and esophagus forward and to the side opposite the goiter, with or without compression. These types of goiters sometimes attain a large size and may encroach significantly upon the upper lobe of the lung.

When small, a posterior goiter can usually be removed through a cervical approach. If this type of goiter is suspected, the initial approach should be made by the cervical route because of the location of the major blood supply which is in the neck. Intrathoracic component may have acquired or already possesses good sized vascular channels(13). Accordingly, the surgeon should not persist unrelentingly in the attempt to remove the mass by this route but should remove it through a thoracotomy incision suitably placed (13). The use of the sterile spoon technique to assist in the transcervical delivery and extraction of these deep intrathoracic masses have been reported by Landreneau et al (1).

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