

A Rare Case of Intrathoracic Malignant Goiter

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ABSTRACT

Intrathoracic extension of a goiter is rare and the anaplastic carcinoma in the intrathoracic goiter is extremely rare. Retrosternal or intrathoracic goiter can be operated through cervical incision but in difficult cases sternotomy may be required. We present a case of a 58 year old male who presented with 2-year history of goiter and hoarseness of voice and dysphagia for few months. Ultrasound and CT scan of the neck confirmed marked enlargement and intrathoracic extension of right lobe of thyroid gland. Fine needle aspiration cytology showed atypical cells. Total thyroidectomy was performed through

cervical and sternotomy incisions. Intraoperatively, tumor was found to be dumbbell shaped and the thoracic part was larger than the cervical part. Tumor was compressed by the right subclavian vessels anteriorly and by the ribs posteriorly. Histopathological examination showed spindle cell variant of the anaplastic carcinoma of thyroid. Anaplastic carcinoma can rarely be intrathoracic and still be resectable. Even after sternotomy, removal and delivery of the thoracic part of gland is not possible and additional maneuvers have to be performed.

Keywords: Intrathoracic; Anaplastic; Goitre

INTRODUCTION

Intrathoracic extension of the goiter is rare and occurs less often than retrosternal extension [1]. Anaplastic carcinoma is the least common type of malignancies amongst the primary tumors of the thyroid gland [2] and anaplastic carcinoma in the intrathoracic thyroid is extremely rare [3]. Anaplastic carcinoma of the thyroid gland is a rapidly growing cancer. At the time of diagnosis, anaplastic carcinoma of thyroid is usually not resectable [4]. The survival after diagnosis is few months [5]. While the imaging modalities, such as chest radiograph, thyroid scan, computed tomographic (CT) scan and magnetic resonance imaging (MRI) may show extension into the chest or behind the sternum [6], these modalities are unable to reliably determine the resectability of the goiter.

Intrathoracic or retrosternal part of a benign or malignant goiter usually can be resected through cervical incision made for routine thyroidectomy [7]. Occasionally, sternotomy is needed for difficult cases [8]. Rarely, operative technique may need to be modified even after

sternotomy, for safe and complete removal and delivery of intrathoracic or retrosternal goiter. We present a case of a patient who presented with a large malignant goiter extending into the upper thorax and needed not only sternotomy but also additional surgical manoeuvre for complete and safe resection.

CASE REPORT

A 58-year male patient presented to the outpatient clinic with progressively increasing, painless swelling in front of the neck for 2 years. Seven months prior to presentation, patient developed hoarseness of voice, 3 months ago he developed dysphagia, and 2 months ago he developed dyspnea and orthopnea. Hoarseness, dysphagia, and dyspnea worsened during the few weeks before presentation. There were no symptoms of hyper or hypothyroidism. Patient's social history was significant for 40-pack-years of smoking. His physical examination was normal except that he had a large, irregular anterior neck swelling measuring 10 x 14 cm in size. The swelling moved with deglutition but

Conflict of Interest: None declared

This article has been peer reviewed.

Article Submitted on: 1st April 2016

Article Accepted on: 7th June 2016

Funding Sources: None declared

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Cite this Article: Muhammad Y, Gondal KM, Qayyum R, Karn AK. A rare case of intrathoracic malignant goiter. *J Pioneer Med Sci* 2016; 6(3):93-96

this mobility was markedly reduced. Swelling had smooth surface, was hard in consistency, non-tender, fixed to deep structures, with normal temperature of the overlying skin. Lower limit on right side of swelling was not reachable and neck veins were engorged. The patient became dyspneic and neck veins became prominent on elevating arms above his head (positive Pemberton's sign). Trachea was shifted to the left. His carotid pulse was palpable but displaced postero-laterally (negative Berry's sign). Lymph nodes were not palpable. The upper zone of the right chest was dull on percussion.

His laboratory data showed normal complete blood count, electrolytes, and renal and thyroid functions with thyroid stimulating hormone (TSH) 2.02 mIU/L, T4 1.31 units and T3 100.6 ng/dL. Chest radiograph showed extension of thyroid into the chest with mass occupying upper one third of right chest cavity (Figure 1). A neck ultrasound showed large lobular well encapsulated thyroid mass measuring 68 x 52.8 mm and extending into the superior mediastinum compressing and displacing the trachea towards left. CT scan confirmed the presence of a large nodular mass involving right lobe of thyroid without cervical or mediastinal lymphadenopathy. Fine needle aspiration cytology had scant aspirate with degenerate atypical cells. Due to the patient's clinical features and imaging findings, complete surgical excision of the thyroid gland was performed with help of cardiothoracic surgeon.

A routine collar crease incision and Layhe's technique was used to access the neck part of the thyroid gland and median sternotomy for the intrathoracic component. Intraoperatively, a large right lobe of the thyroid gland was noted which was extending into the right chest behind clavicle. The intrathoracic part was 2.5 to 3 times larger than the neck part and was compressed anteriorly by the subclavian vessels and posteriorly by ribs giving it a dumbbell shape (Figure 2). The mobilization and delivery of the thoracic part of the thyroid gland was not possible due to its large size and proximity to vessels. We performed a small vertical incision in the capsule above the subclavian vessels, debulked the thyroid gland while avoiding any spillage of its contents, and were able to deliver the thyroid gland into the neck safely. Bilateral thyroid lobectomies were performed after securing recurrent laryngeal nerves and parathyroid glands. Sternotomy and neck incisions were closed over drains after achieving haemostasis. Histopathological examination of

Figure 1: Chest radiograph showing extension to right chest

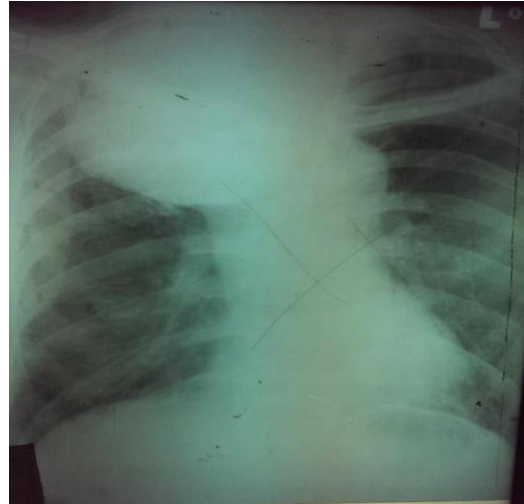


Figure 2: Surgical exposure of the operative field showing the intra thoracic dumbbell tumour

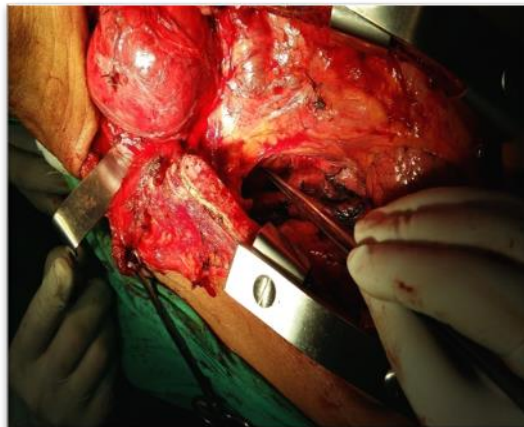


Figure 3: Resected surgical specimen after total thyroidectomy



the resected specimen showed well circumscribed spindle cell lesion with features of anaplasia including pleomorphic hyperchromatic nuclei and focal areas of necrosis. Benign thyroid follicles were seen at the periphery of the lesion. Cells were positive for vimentin but were negative for cytokeratin and epithelial membrane antigen; findings consistent with spindle cell type of anaplastic carcinoma of the thyroid gland. Patient's postoperative course was uneventful and he was discharged home on 6th post-operative day. His hoarseness of voice had improved at 3-week follow-up visit.

DISCUSSION

Among all the primary thyroid carcinomas, anaplastic carcinoma is the least common [9]. Usually it is not resectable and the resection is possible only if it presents before extension to adjacent structures. The tumor grows rapidly and has short clinical history [5]. The larger the tumor size, lesser are the chances of it being resectable. Anaplastic carcinoma may arise in a normal or an abnormal gland [10]. Intrathoracic extension of anaplastic carcinoma usually makes it inoperable [11]. The involvement of the vascular structures or airway makes the situation worse [12]. In this patient, the tumor was dumbbell shaped and the thoracic part was larger than the cervical part of the tumor. The right subclavian vessels anteriorly and rib posteriorly were compressing and straddling the tumor. For total thyroidectomy, either the tumor had to be divided at the point of compression by the vessels or division of rib. Both of these maneuvers can make the operation difficult and time consuming. We opted for a different approach by making a small longitudinal incision in the cervical part of tumor and the bulk of the tumor was reduced from inside. Thus, tumor was able to be delivered in the neck and subsequently removed. Every precaution was taken to avoid the spillage and contact of tumor in the operative field.

Anaplastic carcinoma is uncommon in intrathoracic goiters, however, the fact that such malignancies can grow considerably with no significant change in the patient's symptoms argues for removal of all substernal goiters [13]. The preoperative diagnosis of thyroid carcinoma in intrathoracic goiter is difficult and often impossible [14].

A thyroid cancer in intrathoracic goiter has higher chance of being resected through a thoracic approach because of the need for surgical resection and the possibility of a greater

extent of growth in the mediastinum [15]. The initial approach must be cervical, in any case, for a better control of the vascularization and to grant a complete removal of the cervical portion of the gland with no risk of damage of the recurrent laryngeal nerve. In most cases, the intrathoracic mass can be removed through a partial sternotomy, which is a simple enlargement of the cervical incision. However, when the mass descends into the right posterior mediastinal space, a thoracotomy can become necessary for a safe and complete removal of the tumor [16]. Histologically, the intrathoracic forms are often anaplastic or rare.

In conclusion, the anaplastic carcinoma can very rarely be intrathoracic and still be resectable. Even after sternotomy for removal and delivery of thoracic part of gland, additional maneuvers have to be performed for complete resection.

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