

Thyroidectomy in Substernal Goitre: Our view point

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Abstract:

Objective: To assess the need and complications of thyroidectomy in substernal goiter.

Study Design: A descriptive retrospective study.

Place & Duration : Department of Ear Nose Throat and head & neck surgery, Fatima hospital Baqai Medical University and Department of Surgery Sir Syed Girls Medical College Karachi between January 2001 to September 2011.

Patients and Methods: Seventeen patients of both gender and different ages of substernal goiter who underwent thyroidectomy between January 2001 to September 2011 were studied regarding the indications and complications of thyroidectomy.

Results: Only one patient (5.88%) was presented with acute airway obstruction. Three (17.65%) patients were complained of dyspnoea in supine position, dysphagia and hoarseness were noticed in two (11.76%) patients while eleven (64.71%) of them were asymptomatic instead of obvious neck swelling. Total thyroidectomy was performed in fourteen (82.35%) cases and lobectomy with isthmectomy was the procedure adopted in three (17.65%) patients. CT scan was done in twelve (70.59%) of these cases. Majority of our cases i.e, sixteen (94.12%) were benign while malignancy was seen in one (5.88%) patient only. Complications like haematoma seen in one (5.88%) patient, recurrent laryngeal nerve injury was noted in two (11.76%) cases, hypoparathyroidism (transient) was seen in two (11.76%) of them and wound infection was observed in one (5.88%) patient. There was no mortality pre and post-operatively and none of them had permanent hypoparathyroidism but one (5.88%) of our patient had permanent unilateral recurrent laryngeal nerve injury.

Conclusion: Sub-sternal goiter is often asymptomatic and thyroidectomy is the treatment of choice with very low mortality and morbidity.

Keywords: Substernal goitre, total thyroidectomy, recurrent laryngeal nerve injury

Introduction:

When thyroid gland extended into the mediastinum is known as substernal goiter. The extension of goiter is commonly seen in the anterior mediastinum while posterior mediastinum is a rare site.¹ The sub-sternal goiter is actually the thyroid mass which goes beyond the superior thoracic inlet for at least 3 cm which retain the connection between the cervical & thoracic part and maintaining a vascularization supplied by thoracic arteries.² Nearly 5 % of thyroid goiter descends to a sub-sternal region and only 5 % of all mediasternal masses are thyroid goiter.³

The substernal extension of a goiter can cause compression of some mediastinal structures e.g, trachea, oesophagus or superior vena cava.⁴

The tracheal compression and severe respiratory compromise are the commonest findings experienced in 45 % of the cases of sub-sternal extension of a goiter and it is one of the urgent indications of sub-sternal thyroidectomy.⁵ Dyspnoea, choking are the common presenting symptoms and CT scan is an important investigation for pre-operative evaluation regarding the extension, size & operative planning.³ The

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severity of compressive symptoms & potential risk of post-operative complications are usually related to the large size of sub-sternal goiter.

The transcervical approach is the commonest incision to excise the majority of sub-sternal goiter while transsternal incision is needed in few cases without significant morbidity and mortality⁶.

There are different factors like size, location and depth of the sub-sternal goiter which may need sternotomy ended with post-operative complications.⁷

Acute airway obstruction and malignancy may be seen in progressively enlarged substernal goiter.⁸ Thus surgery is the modality of treatment recommended to all cases regardless of symptoms unless there is any contra-indication.

Patients and methods:

This study was conducted between January 2001 to September 2011 in the department of surgery Sir Syed Medical College & Department of ENT & Head and Neck surgery, Fatima hospital Baqai Medical University, Karachi. In this study all of our 17 patients presented with goiter that has extended into the thoracic inlet i.e. up to 4th thoracic vertebra. Patients of both gender and ages between 39 to 71 years were included in our study. Out of 17 patients 13 were females and only 04 were males. Pre-operatively a standard protocol of assessment which includes history, through clinical examination of ear, nose and throat and head and neck region. Blood CBC, urea, sugar, creatinine, electrolytes thyroid profile, thyroid scan, ultrasound, X-ray chest, X-ray neck lateral view and urine analysis were performed in every patient. All the patients has a pre-operative assessment & record of vocal cords movements via flexible fiberoptic laryngoscopy which is repeated post-operatively in cases who has any change of voice. FNAC was performed in 07 cases. Pulmonary function test was done in only one case of acute respiratory obstruction. CT scan was done in 12 cases to know the extent of goiter and degree of tracheal compression & deviation. All our cases were euthyroid.

Informed consent was taken from all for the possibility of sternotomy if required. Under general anaesthesia all the patients were lying supine with neck extended, the area was exposed from chin to the nipple line. Cervical or neck crease incision was preferred in all cases & strap muscles was transected when required to improve the accessibility. Thyroid gland was mobilized by capsular dissection with the ligation of superior thyroid vessels, middle thyroid vein and inferior thyroid vessels carefully. The sub-sternal part of the thyroid gland was manually retracted and delivered to the cervical region with the identification of the recurrent laryngeal nerve in majority of the cases.

Sub-sternal part of the goiter was delivered successfully in all patients and sternotomy was not required in any case. The blood loss was minimal during surgery and transfusion was required in only one patient. In total thyroidectomy two & one suction drain was placed in partial thyroidectomy cases for few days, wound closed in layers.

Post-operatively all cases were followed up for 5 months.

Results:

Thyroidectomy performed in 17 patients having sub-sternal goiter. Six out of 17 patients were symptomatic where as 11 were asymptomatic instead of obvious neck swelling. Dyspnoea was the most dominant symptom in 3 (17.65%) patients, stridor and acute airway obstruction in 1 (5.88%) case, dysphagia and hoarseness was observed in 2 (11.76%) patients only.

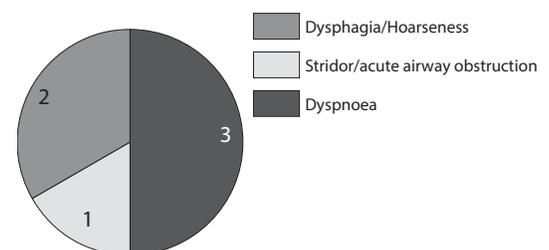


Figure 1: Symptoms

Table 1: Clinical Presentation

Presentation	No. of patients	Percentage
Acute Airway Obstruction Strider	01	05.88%
Dyspnoea	03	17.65%
Dysphagia & Hoarsness	02	11.76%

Table 2: Histology of Substernal goitre

Histopathology of the goitre	No. Of patients	Percentage
Nodular Hyperplasia	16	94.12%
Follicular Carcinoma	01	05.88%

Table 3: Complications

Complications	No. of Patients	Percentage
Haematoma	01	05.88%
(Transient) Recurrent Laryngeal nerve palsy	02	11.76%
(Transient) Hypoparathyroidism	02	11.76%
Wound infection	01	05.88%
Permanent recurrent laryngeal nerve palsy	01	05.88%

In majority of 6 symptomatic cases the duration of symptoms ranged from 5 to 55 months. One patient in our study presented with severe stridor due to acute airway obstruction and was managed via endotracheal intubation in emergency followed by thyroidectomy. All of our cases were found euthyroid. A cervical incision was found to be adequate in our series for thyroidectomy while sternotomy was never required in any of them. Total thyroidectomy was performed in 14(82.35%) cases while lobectomy and isthemectomy was the procedure in only 3(17.65%) patients.

Most of our patients were recovered without any untoward effects with a post-operative hospital stay between 2to 12 days. Histopathology showed benign nodular hyperplasia in 16(94.12%) patients while malignancy i.e. follicular carcinoma observed in 1(5.88%) patient only.

Complications encountered in our series during the post-operative period were recorded. Post-operative haematoma was seen in 1(5.88%)case, recurrent laryngeal nerve paralysis(transient) in 2(11.76%)patients, transient hypoparathyroidism observed in 2(11.76%) cases, wound infection was noticed

in 1(5.88%) patient 1 (5.88%) patient of follicular carcinoma developed permanent recurrent laryngeal nerve paralysis.

Discussion:

When the enlarged thyroid gland extended into the thorax considered as sub-sternal or intra-thoracic goiter. According to the many authors when more than 50% of the thyroid gland mass lies below the plane of 1st rib⁹ either symptomatic or asymptomatic is called sub-sternal goiter which may also considered to cause surgical problems.¹⁰ In our study all the masses were upto thoracic inlet.

Due to the progressive nature, symptoms of compression & nature of pathology surgery remains the main modality of treatment in sub-sternal goiters.⁸ Pre-operatively CT scan is the main imaging studies done to assess the extent of the goiter.¹¹ In spite of neck swelling & sub-sternal extension in our study 11 of 17 patients were found asymptomatic.¹²

In 06 Symptomatic patients 03 were having dyspnoea, dysphagia and hoarseness were observed in 02 cases, only 01 of them presented with acute airway obstruction who was managed via endotracheal intubation in emergency & thereafter thyroidectomy. Many retrospective studies mentioned similar symptoms.¹³ In asymptomatic patients the post-operative complications were comparatively less which also proved from a previous study.¹⁴ Tracheal collapse in post-operative phase was absent in our series, but it has observed more oftenly in large & long standing sub-sternal goiters.¹⁵ Propensity of malignancy in sub-sternal goiter lies between 03 to 19 % according to the literature review¹⁶ while in our series only 01 (%) patient has follicular carcinoma of the thyroid. Transcervical approach was sufficient for the excision of all thyroid masses¹⁸ in our study and sternotomy was not required in any of them while this approach is necessary in large intra-thoracic goiters with malignancy requiring the removal of mediastinal lymph nodes or having vascularity from the mediastinal vessels.¹⁷ During the thyroidectomy we did not noticed any complications and it also supported by

retrospective literature search with a little different ratio.¹⁹ There was no mortality or permanent hypoparathyroidism recorded during this study. The sub-sternal goiter is a definite indication of thyroidectomy because of the progressive enlargement in size, frequent risk of respiratory compression, dysphagia, hoarseness, propensity of malignancy in long standing cases and very low morbidity after thyroidectomy.^{20,21}

Conclusion:

Due to the potential risk of airway obstruction & malignancy the sub-sternal goiters should always be treated with early thyroidectomy.

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