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### RETROSTERNAL GOITER AND SURGICAL APPROACHES- PESHAWAR EXPERIENCE OF 144 CASES

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#### **ABSTRACT**

##### ***Background:***

A typical reason for the compression of nearby structures, retrosternal goitre may also include malignancy. Compression of nearby structures, avoiding future consequences, and getting a diagnosis is only a few of the precise reasons why resection is necessary.

##### ***Objective:***

To observe the various clinical presentations of retrosternal goiter and evaluate their management and outcome.

##### ***Methodology:***

Retrospective analysis was done on the clinical records of 144 patients with retrosternal goitre who had surgical treatment during a 12-year period (2002-2014). To analyse the

clinical presentation, surgical procedures, histology of specimens, and surgical result, records were thoroughly examined.

### **Results:**

Dyspnea was the most frequent presenting symptom (39.6%), and complete thyroidectomy was the surgical method of choice. In 90.97% of the instances, the RSGs were only removed via a collar incision. 26.38% of the thyroid specimens had malignancy identified by histology. Ten individuals had difficulties, and there were two fatalities.

### **Conclusion:**

Retrosternal goiters can be delivered through the cervical approach, but where delivery is difficult it can be aided by a mediastinotomy thereby avoiding splitting the sternum.

### **INTRODUCTION:**

A goitre that protrudes beyond the thoracic inlet has been referred to as retrosternal, substernal, intrathoracic, or mediastinal. They have been seen in 1-20% of thyroidectomy patients, according to studies<sup>1,2</sup>. According to many reports<sup>3-5</sup>, these uncommon creatures may go for a long period without showing any symptoms. They may, however, suddenly increase due to bleeding, undergo cystic degeneration or malignant transformation, or get suffocated, which can be fatal<sup>6</sup>. Surgery is a crucial component of these patients' care, however it is still debatable whether all or just certain patients with retrosternal goitre (RSG) should have the procedure<sup>7</sup>. Our goal in conducting this study was to define the typical findings of our patients with respect to the demographic variables, clinical presentation, the pathological state of the goitres, and most importantly, the role of surgery in its treatment. We present our experience with the surgical management of RSG. Retrosternal goitre (RSG), often referred to as cervical goitre, is a neck enlargement caused by a buildup of thyroid tissues behind the manubrium, between the lungs and the sternum. It is a rare disorder that affects 0.07–2.2% of enlarged thyroids and 0.2–3% of all solitary thyroid nodules.<sup>1–7</sup> Although it is generally acknowledged that multilocularities followed by growth of the superior mediastinum may cause it, the cause of retrosternal goitre is unclear. Its potential for malignancy should also be acknowledged.<sup>1–7</sup> Surgical excision using a prolonged cervical incision or a combination of mediastinotomy and cervical incisions is the conventional therapy for RSG.<sup>8–11</sup> Following thyroidectomy for RSG, the rates of local recurrence and postoperative complications have been estimated to be 7.8-19% and 1.7-9%, respectively.<sup>11–13</sup> In order to maximise results, it is crucial to establish the accurate diagnosis and exercise the necessary surgical cautions. This study's objectives were to identify the different clinical manifestations of retrosternal goitre and assess the treatment options and results.

### **METHODOLOGY:**

Retrospective analysis was done on the computerized clinical records of 144 patients who had surgery for retrosternal goitre during a 12-year period (2002-2014). When the computerised tomography (CT) scan revealed that the bulk of the gland (more than 50%) was situated below the thoracic inlet, retrosternal

goitre was the official diagnosis. We excluded large thyroid tumors with inferior margins at the thoracic inlet. In addition to standard diagnostics, all patients received thyroid examinations, including thyroid function tests, chest X-rays, indirect laryngoscopies, fine needle aspirations (FNA), and CT scans of the neck and chest. Thyroid scintigraphy was done on certain patients. All patients had pulmonary function testing. Patients were assessed in terms of their histological findings, postoperative problems, demographics, surgical methods, and thyroid gland location. All patients underwent follow-up. Analyses were done on information pertaining to demographic traits, patient history, clinical presentation, laboratory investigations, imaging tests, operation specifics, histology, and outcome. The SPSS statistical programme, version 25, was used for data collection and analysis. Descriptive statistics and frequency tables were produced.

### *Surgical techniques*

In 126 instances (87.5%), the thyroid was completely removed; in 16 cases (12.5%), the thyroid was almost completely removed. In 25 instances (17.4%), a mediastinotomy was performed after a paramedian incision was made to help with the treatment since the goitres in 27 cases (18.8%) were so big. In every other instance, a collar incision was the sole method used to remove the goitres (Table 2).

### *Histology*

54.2% of people had multinodular goitre, 12.5% had benign tumours, and 26.39% had cancer, according to the pathology findings. Of them, 6 (4.2%) had metastases from an unidentified underlying malignancy, whereas 6 (4.2%) had papillary thyroid carcinomas, 3 (2.1%) had follicular thyroid carcinomas, 2 (1.4%) had Hurthle cell carcinomas, and 12 (8.3%) had follicular thyroid carcinomas (Table 3).

### *Outcome*

Ten patients (6.9%) suffered postoperative complications, including two (1.4%) deaths, eight (5.6%) local recurrences, one (0.7%) recurrent laryngeal nerve palsy related to postoperative infection, four (2.8%) wound dehiscences, and one (0.7%) haematoma. All other patients had positive post-operative results.

### **RESULTS:**

There were 108 female patients out of a total of 144 patients. The age range was 32 to 77 years, with 47 being the median. The demographics of the patients are presented in (Table 1). Except for one patient who had a toxic goitre that was managed before surgery, all of the patients had normal thyroid function. Dyspnea was the most typical presenting symptom, occurring in 39.6% of patients, followed by neck edoema in 31.8% (Table 2). Every patient was given the option of surgery, and there were no substantial comorbidities. Total thyroidectomy was the surgical treatment that was most often performed

(52.3%), and 26.38% of the specimens had malignancy identified by histology (Table 1). There were 21 follicular carcinomas and 17 papillary carcinomas. In 90.97% of the patients, a cervical collar incision was sufficient for the excision of these tumours. Only one patient required a median sternotomy; in the other 12 instances, an anterior mediastinotomy was performed to press the goitre from below to facilitate delivery via the cervical collar incision. Twelve morbidities were recorded, the majority of which totally resolved, and there were two perioperative fatalities (Table 3). Following surgery, thyroid hormone was administered to all patients in order to reduce thyroid stimulating hormone (TSH). An average follow-up of two years (with a range of three months to seven years) revealed no recurrence. Features of the population The 144 patients included in this research had a mean age of 52.015.3 years, with 66 (45.8%) males and 78 (54.2%) women. The most prevalent symptom that presented itself was dyspnea (39.6%), which was followed by dysphagia (25.0%), hemoptysis (9.7%), discomfort (5.6%), and dysphonia (4.2%). The goitres' average size was 121.7 cm (Table 1).

**Table 1:** patient's demographics

S.NO	VARIABLE	VALUE	%
1	Median Age	47 years (range 32-77)	
2	Male: female ratio	1:3	
3	Location of retrosternal	Right	34%
		Left	29%
		Bilateral	37%
4	Surgical procedure	Total thyroidectomy	52.3%
		Near total thyroidectomy	25.7%
		Subtotal thyroidectomy	19.8%
		Hemithyroidectomy	2.2%
5	Histological diagnosis	Benign	106 73.62 %
		Malignant	38 26.38%
		Papillary	17 11.80%
		Follicular	21 14.58%

**Table 2:** Clinical Presentations

S.NO	SYMPTOM/SIGN	NO (%)
1.	Neck swelling	31.8.%
2.	Dysnea	39.6%
3.	Neck discomfort	18.9%
4.	Hoarseness of voice	2.5%
5.	Asymptomatic	7.2%

**Table 3:** Postoperative Complications

S.NO	VARIABLE	NO (%)
	<b>MORBIDITY</b>	<b>10</b>
1.	Transient symptomatic hypoparathyroidism	4
2.	Haematoma	2

3.	Wound infection	2
4.	Pneumonia	1
5.	Transient laryngeal nerve paresis	1
	<b>MORTALITY</b>	<b>2</b>
1	Redo thyroidectomy	1
2	Tracheomalacia	1

### DISCUSSION:

Thymomas, lymphomas, and germ cell tumours are among the most frequent masses in the anterior mediastinum. Anterior mediastinal masses may also be caused less often by retrosternal goitres (RSG). A goitre that spreads beyond the thoracic inlet has also been referred to as substernal, intrathoracic, or mediastinal. The precise administration and definition of an RSG are not widely agreed upon. When the thyroid gland is enlarged and more than half of its mass is located below the thoracic inlet, the condition is referred to as RSG. RSGs are divided into the secondary and main groups. The majority of RSGs are secondary types, which are characterised by continuity with the gland's cervical component and blood flow from the cervical arteries. The other condition is a true primary intrathoracic goitre, which develops from abnormal thyroid tissue that is ectopically situated in the mediastinum. They do not have a connection to the cervical thyroid, as was also evident in our instance, and instead get blood from mediastinal veins. Less than 1% of all RSGs 8,9 are these unusual RSGs. For RSGs, a CT scan is regarded as the preferred imaging technique. The structure and size of the RSG are plainly visible on a CT scan, particularly its connections to the trachea, oesophagus, and large blood arteries. The information gained with magnetic resonance imaging is not commonly utilised since it does not contribute much. In addition, not all known RSGs are radioiodine avid, hence nuclear imaging with an Iodine-131 or Technetium-99 scan is not regarded as important in the preoperative assessment of known RSG.10,11.As was the case with the patient who was the subject of the study, the majority of patients in RSG instances appear with shortness of breath or symptoms resembling asthma (68.8%). A neck mass (75%), hoarseness (37.5%), dysphagia (31.3%), stridor/wheezing (19%), or SVC blockage are examples of other presenting methods. Up to 31% of cases of upper airway blockage from the thyroid gland have been documented.12 and 11% of patients had difficulty being intubated.13 Asthma is sometimes misinterpreted as central airway obstruction, which causes symptoms of dyspnea, stridor, or obstructive pneumonia.14 In our research, the majority of the patients had dysnea, which they reported in 39.6% of cases, followed by neck swelling, neck pain, hoarseness of voice, 2.5%, and asymptomatic cases, 7.2%.Less than 10% of RSG patients have thyrotoxic characteristics.12 Only one patient in our study had a toxic goitre. Between 0 to 50% of RSG patients have hyperthyroidism, according to stated incidence rates.6 None of our RSG patients received medical care. L-thyroxine treatment trials that slowed the course of the condition were ineffective. Retrosternalgoitres can only be effectively treated surgically. Radio-iodine treatment is often unsuccessful in treating big goitres16 and may cause acute inflammation and edoema of the gland with a risk of airway obstruction. Suppressive therapy with thyroxine is typically inefficient in lowering the size of multinodular goitres15; 16. There is much discussion on the best surgical technique for RSG17. Previous authors

recommended an open thoracic approach for all primary RSGs in order to safely divide the intra thoracic vascular supply, but in our study, we found that a cervical collar incision was sufficient for the removal of these masses in 90.97% of patients with favourably positioned anterior mediastinal goitres. The preferred procedure is often a complete thyroidectomy, which eliminates the possible need for follow-up surgery because of the regeneration of residual thyroid tissue<sup>11</sup> More than 70% of the patients we treated had thyroidectomies that were entire or nearly total. If a thyroid cancer was unintentionally discovered after surgery, doing comprehensive thyroid excision prevented the need for reoperation.<sup>19</sup> According to several investigators, thyroidectomy for RSG led to transient hypoparathyroidism more often than a regular thyroidectomy<sup>20</sup>. Four participants in our research had transitory hypoparathyroidism.

According to prospective studies, there are 1.3–3.7 new instances of cancer in goitres for every 1000 individuals.<sup>21,22</sup> The rate of malignant transformation is equal in retrosternal goitres to those located wholly in the neck, according to a recent evaluation of evidence-based therapy of sub-sternal goitres.<sup>16</sup> In our investigation, 26.38% of the final histological diagnoses had signs of malignancy. This was much greater than the reported malignancy occurrences in RSG, in several studies. However, the prevalence of well-differentiated cancer in our patients is consistent with the earlier reports<sup>25</sup> (5, 23, 24). Retrosternal goitre is a rare illness that may lead to consequences such the swelling of the superior mediastinum, compression of surrounding tissues, and the possibility of cancer.<sup>1–7</sup> Clinicians need to understand whether surgical intervention is warranted and what risks could be involved. Therefore, in order to get the best results, the right diagnostic and surgical strategy must be used. Dyspnea was the most frequent presenting symptom in this sample (39.6%), which is consistent with other data. Dyspnea was mostly brought on by compression of the lung parenchyma. These findings suggest a little window of time between the start of symptoms and the RSG diagnosis. The most frequent surgical approach was a complete thyroidectomy, and 90.97% of the time, a cervical incision was utilised to remove the goitre. After a cervical approach failed, a paratracheal route was employed in a small percentage of instances (4.86%). In these instances, median sternotomy was not required since RSG was seen in the paratracheal region. These findings suggest that a cervical approach is a safe and effective way to remove RSG while avoiding potentially dangerous issues like fracturing the sternum. The histology findings showed that malignant tumours were present in 26.39% of the patients. This result is much greater than those of earlier investigations.<sup>15,16</sup> The majority of malignant thyroid tumours (8.3%) were papillary thyroid carcinomas, followed by follicular thyroid carcinomas (2.1%). This result is in line with other observations indicating papillary thyroid carcinoma is the most prevalent cancer linked to RSG.<sup>15,18</sup>

Two fatalities were noted in this research, which may have been caused by the procedure or a coexisting condition. We found that problems such local recurrence, recurrent laryngeal nerve palsy, wound dehiscence, and haemorrhage occurred in 6.9% of patients. These findings suggest that in order

to limit post-operative problems, proper preoperative assessment and sufficient attention should be performed throughout the treatment.

### CONCLUSION:

The poor response of RSG to medical treatment, the higher incidence of symptoms related to compression, difficulty in following clinically, the risk of malignancy, and development of acute airway obstruction, make the presence of RSG an indication for surgery. Cervical incision is nearly always adequate, with acceptable operative mortality and complications.

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