

# Surgical Approach To Retrosternal Goiter

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## ABSTRACT

<i>Objective</i>	<i>To describe the surgical outcome of patients presenting with retrosternal goiter in terms of need of midline sternotomy and procedure related complications.</i>
<i>Study design</i>	<i>Cross sectional descriptive study.</i>
<i>Place &amp; Duration of study</i>	<i>Department of Surgery, Jinnah Postgraduate Medical Center Karachi, from February 2002 to August 2018.</i>
<i>Methodology</i>	<i>All patients were enrolled from the outpatient department after preoperative workup. CT scan was performed in all patients to demonstrate the extent of retrosternal goiter. Patients with recurrent thyroid surgery and previous neck surgery were excluded. Data was collected on predesigned form. Descriptive statistic were used to present data.</i>
<i>Results</i>	<i>This study included a total number of 65 patients, out of which 42 (64.61%) were females and 23 (35.38%) males. Male to female ratio was 1 to 1.8. Age group was from 45 year to 64 year. Three (4.61%) patients underwent midline sternotomy due to adhesions and pear shape of the gland. Complications included hoarseness and hypocalcaemia in 1 (1.53%) patient and hypocalcaemia in 1 (1.53%) patient.</i>
<i>Conclusion</i>	<i>Retrosternal goiter can be safely managed through neck incision in experienced hands with acceptable complications rate.</i>

*Key words*      *Retrosternal goiter, Midline sternotomy, Goiter.*

## INTRODUCTION:

Goiter extending behind the sternum is labeled as a retrosternal goiter. However there is no standard definition for this term. The most acceptable one describes it as a condition when more than 50% of goiter is located in mediastinum.<sup>1,2</sup> Albrecht Von Heller described retrosternal goiter in 1749 and Klein was the first surgeon who operated successfully on a retrosternal goiter in 1820.<sup>3</sup> The retrosternal goiter is present in 2-19% of all thyroid diseases and mainly extends into anterior mediastinum. only 10-15% are located in the posterior mediastinum.

Surgery is the only acceptable effective treatment.<sup>5,6</sup> Radioiodine therapy and medical treatment by thyroxine require large doses that can result in partial reduction and is rarely effective.<sup>7</sup> The removal of retrosternal goiter is considered as a challenge for the surgeons due to technical issues.<sup>8</sup> Machado observed that majority of retrosternal goiters can be removed through neck incision. Sternotomy or lateral thoracotomy has been reserved for retrosternal goiters extending beyond the aortic arch into the posterior mediastinum.<sup>9</sup> As compared to that, Kilic recommend the use of transthoracic approaches for better surgical exposure and to avoid catastrophic results.<sup>10</sup> The aim of this study was to find out if there was a need of midline sternotomy in patients with retrosternal goiter and to note procedure related complications.

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## METHODOLOGY:

This cross sectional descriptive study was conducted at the Surgical Department Jinnah Postgraduate Medical Center Karachi, from

February 2002 to August 2018. All patients enrolled in this study were clinically evaluated in the outpatient department. History of dyspnea, hoarseness of voice and dysphagia were noted on a predesigned form. Lower limit of the gland and neck veins engorgement were assessed as indicators of retrosternal extension.

A routine work up and CT scan were performed before surgery in every patient to find out the extent of the gland, its relation and compression effects on trachea, esophagus and major vessels. The goiter was considered retrosternal only when it extended below the sternum on CT scan. Only such cases were included in this study. Patients with recurrent thyroid surgery, previous neck surgery and midline sternotomy were excluded.

Written informed consent was taken. Sixty-five patients who were included in this study underwent total thyroidectomy. A thoracic surgeon was available when needed. All surgeries were performed by single consultant who had an experience of dealing with the thyroid surgeries. Recurrent laryngeal nerve and parathyroid glands were identified in all patients. In difficult cases midline sternotomy was used. Postoperative complications like hoarseness of voice and hypocalcemia were also recorded. Descriptive statistics were used to present the data.

## RESULTS:

A total of 65 patients were included in this study. There were 42 (64.61%) female and 23 (35.38%) male patients. The male to female ratio was 1 to 1.8. Age of the patients was from 45 year to 64 year. The most common presenting feature was neck swelling that was present in 61(93.84%) patients. Four patients (6.15%) had chronic cough but no neck swelling was observed. They were diagnosed on investigations. Forty-eight (73.84%) patients presented with difficulty in breathing. No patient complained of dysphagia and hoarseness of voice. Sixty-one (93.84%) patients had retrosternal extension in anterior mediastinum whereas 4 (6.15%) patients had retrosternal extension in posterior mediastinum.

Sixty-two (95.38%) patients were managed through cervical incision whereas only 3 (4.61%) patients needed a midline sternotomy; all of these were males out of whom 2 (3.07%) had pear shaped goiter and in one there was difficult delivery because of adhesions. One patient (1.53%) needed ICU care for two days. One (1.53%) patient developed hoarseness and hypocalcemia, but, improved in a month time. One (1.53%) patient developed

hypocalcaemia that needed injectable calcium for three weeks followed by oral calcium replacement for four months. Histopathology report showed multinodular goiter with no carcinoma in the gland. No mortality occurred in this group of patients.

## DISCUSSION:

Retrosternal goiter is divided into primary and secondary types. Primary originates from ectopic mediastinal thyroid tissue and receives its blood supply from the mediastinal vessels. It is less than 1% of all the retrosternal goiters.<sup>3</sup> Secondary retrosternal goiter migrates from the neck due to negative intra thoracic pressure, gravity, traction forces during swallowing and pressure of the anatomical barrier, receiving its blood supply from neck.<sup>8</sup> About 20-40% of the retrosternal goiters are discovered incidentally during radiographic studies.<sup>11</sup> Male to female ratio in this study was 1.8 to 1 while this was 1:4 according to other study. In four (6.15%) patients, retrosternal goiter was located in posterior mediastinum while in 61(95.38%) it was in anterior mediastinum. Main presenting complaint in index study was mass in the neck, as described by other authors. Dysphagia was observed in 73.84% in this study which was quite high as compared to that reported earlier.

In this study midline sternotomy was performed in cases where it was difficult to deliver the goiter and because of pear shape of enlarged thyroid gland. Cohen performed sternotomy only in the presence of malignancy, extension of goiter below thoracic arch, involvement of posterior mediastinum and presence of ectopic thyroid.<sup>12</sup> Some authors believed that previous thyroid surgery may increase the chances of sternotomy due to adhesions.<sup>13</sup> About 2% of the patients with retrosternal goiter needed sternotomy.<sup>14</sup>

Median sternotomy was performed in only three patients in this study which is almost comparable to other series. Nakaya operated on 44 patients, and none required median sternotomy.<sup>15</sup> Huins et al reported that 2.7% (55 out of 2065) of the patients required median sternotomy.<sup>16</sup> In another review by Nankee, out of over 3000 thyroidectomies, only 7 required sternotomy.<sup>17</sup> Another study conducted by Sakkary showed that 73 patients had retrosternal extension and only one needed sternotomy.<sup>18</sup> In a study by White sternotomy was needed in only 6.5% of the patients.<sup>14</sup> Landerholm performed sternotomy in 3% to deal with retrosternal goiter.<sup>19</sup>

In this study one patient needed median sternotomy due to adhesions. Shape of retrosternal goiter is an important finding to decide about median

sternotomy. In this study two patients required median sternotomy due to pear shaped gland. Qureshi also described that dumbbell, hour-glass, conical or iceberg shaped goiter also had a higher chance of needing a sternotomy.<sup>20</sup> In this study one patient developed transient hypocalcaemia and another developed transient paralysis of the recurrent laryngeal nerve, as compared to 5 (11.9%) and 2 (4.7%) patients in a study by Coskun et al.<sup>21</sup>

**CONCLUSIONS:**

The surgery for retrosternal goiter is challenging for the surgeons as there are more chances of complications. Majority of the cases can be managed by neck incision, and midline sternotomy is reserved for pear shaped gland and in patients with difficult dissection.

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