The Relationship between Giant Goiter and Operative Complications: A Retrospective Study

Fatin R. Polat1*, Yasin Duran1, Havva Nur Alparslan Yümün2, Gülay Sariçam2

1Namık Kemal University Medical Faculty, Department of Surgery, Tekirdag, Turkey
2Çorlu State Hospital, Department of General Surgery, Tekirdag, Turkey

Email: *polat22@hotmail.com

Abstract

Background: Thyroidectomy for giant goiter is a surgical challenge due to distorted and displaced anatomy. The aim of this study is to evaluate the relationship between giant goiter and its operative complications. Material and Methods: A retrospective multicenter study of consecutive patients who had thyroid surgery was conducted, including 639 patients who undergone thyroidectomy in State hospital at Van and Corlu city—Turkey. Seven cases had giant goiter in the patients. Total thyroidectomy was performed all patients. Results: All patients were women. The mean weight of glands removed was 689 gr in giant goiter’s patients. Two operative complications had happened; right site injury of the external branch of the superior laryngeal nerve had happened to one patient; hypocalcemia was happened to another one patient. In those two patients previously were operated partial thyroidectomy. Conclusions: Thyroidectomy for a massively enlarged goiter is technically challenging. The predominant operative complications were related to previously operate and the thyroid gland due to distorted and displaced anatomy. The surgical approach to such cases requires carefully preoperative evaluation and planning. Especially, using of intraoperative nerve monitoring is to be useful in these difficult cases which previously had undergone surgery.

Keywords

Thyroidectomy, Giant Goiter, Technical Difficulties

1. Introduction

Goiters (from the Latin guttur; throat), defined as an enlargement of the thyroid, have been recognized since 2700 B.C. even though the thyroid gland was not documented as such until the Renaissance period [1] [2] [3]. Goiters may be
diffuse, uninodular, or multinodular. It is estimated that goiter affects 5% of the general population [1] [2] [3]. Giant goiter is an enlargement of the thyroid gland not less than 10 gr/kilogram body weight. The massively expanding goiter due to the strategic anatomic location of thyroid gland, in addition to being cosmetically disfiguring can seriously compromise the patency of the trachea and oesophagus [4] [5] [6] [7]. Thyroidectomy for such goiters is a surgical challenge due to distorted and displaced anatomy. The aim of this study is to evaluate the relationship between giant goiter and its operative complications.

2. Material and Methods

A retrospective multicenter study of consecutive patients who had thyroid surgery was conducted. Between July 1999 and December 2016, 639 patients were undergone total or subtotal thyroidectomy due to goiter in State Hospital at Van (1999-2004) and Çorlu city (2015-2016)—Turkey. All patients were living rural area. Before operation all patient was undergone ultrasound examination. Only seven cases of the goiter were included in this retrospective study because of have a giant goiter. Malignant with giant goiter and less than 500 gr goiter were excluded. Total thyroidectomy was performed all patients who had giant goiter by the same author. The results were processed with SPSS® ver. 21.0 (Chicago IL), p < 0.05 was accepted to be statistically significant.

3. Results

Clinical features of patients and operative results are shown in Table 1. Mean age of the patients was 46 (range 37 to 56). All patients were women. Statistically significant differences were found between in women and man (p < 0.005). Mean operative time was 120 mn (range: 105 to 135 mn). The mean weight of glands removed was 689.57 gr (range 600 to 820 gr). Blood loss was negligible in all patients but only two patients required one unit blood transfusion. Right site injury

<table>
<thead>
<tr>
<th>Cases</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>45</td>
<td>37</td>
<td>39</td>
<td>56</td>
<td>43</td>
<td>57</td>
<td>45</td>
</tr>
<tr>
<td>Sex</td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living area</td>
<td>Semi urban area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of procedure</td>
<td>125 mn</td>
<td>120 mn</td>
<td>136 mn</td>
<td>103 mn</td>
<td>135 mn</td>
<td>105 mn</td>
<td>123 mn</td>
</tr>
<tr>
<td>Weight of glands removed</td>
<td>670 gr</td>
<td>600 gr</td>
<td>802 gr</td>
<td>625 gr</td>
<td>605 gr</td>
<td>820 gr</td>
<td>705 gr</td>
</tr>
<tr>
<td>Duration of neck swelling</td>
<td>18</td>
<td>17</td>
<td>30</td>
<td>15</td>
<td>17</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Complication of surgery</td>
<td>No complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retrosternal extension</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tracheal deformity</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tracheal stenosis</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous operation</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
of the external branch of the superior laryngeal nerve was happened one patient. Hypocalcemia was happened another one. These two patients had subtotal thyroidectomy operation previously. Statistically significant differences were found between complications and previously operated in patients (p < 0.005). No another complication was seen in any of these patients. There was no mortality. Histologically all of them were colloid goiters.

Cases 1, 2, 3, 4, and 5: An 45, 37, 39, 56, 43 years’ old women presented with a massively enlarged goiter of more than 18, 30, 15, 17, 20 years duration (Table 1). The thyroid was asymmetrically enlarged and has a smooth surface without areas of encapsulation, irregular scarring and positive Pemberton’s sign. Thyroid function tests; free T3 and T4 were within normal limits, but thyroid stimulate hormone (TSH) levels were high. The patients had substernal extension on the ultrasound examination. After an informed consent total thyroidectomy was performed to the patients. Any complications were not seen. All patients were discharged on the 2nd or 3rd postoperative day. Weight of removed thyroid gland was 670, 600, 802, 625, 605 gr. Lifelong T4 therapy was recommended.

Case 6: A 57-year-old woman presented with a massively enlarged goiter of more than 10 years duration. She had history of partial thyroidectomy 16 years ago. The thyroid was symmetrically enlarged and has a smooth surface without areas of encapsulation, irregular scarring and positive Pemberton’s sign. Thyroid function test; free T3 and T4 were within normal limits, but TSH level was high. The patient had substernal extension on the ultrasound examination. Total thyroidectomy was performed. Injury to right site of the external branch of the superior laryngeal nerve was happened. The patient discharged on the 4’th postoperative day. Weight of removed thyroid gland was 820 gr (Figure 1(a), Figure 1(b)). Lifelong T4 therapy was recommended.

Case 7: A 45-year-old woman presented with a massively enlarged goiter of more than 9 years duration. She had history of partial thyroidectomy 12 years ago. The thyroid is symmetrically enlarged and has a smooth surface without areas of encapsulation, irregular scarring and positive Pemberton’s sign. She had recent history of exertional stridor and neck discomfort. Thyroid function tests; free T3 and T4 were within normal limits, but TSH level was high. The patient had substernal extension on the ultrasound examination. Total thyroidectomy was performed. Hypocalcemia was happened and the patient discharged on the 4th postoperative day. Weight of removed thyroid gland was 705 gr (Figure 2(a), Figure 2(b)). Lifelong T4 therapy was recommened.

4. Discussion

Simple goiter may be physiologic, occurring during puberty or the menses or during pregnancy; or it may occur in patients from endemic (iodine-poor) regions or as a result of prolonged exposure to goitrogenic foods or drugs [1] [2] [3] [4] [5]. It is usually seen in women. All the cases were women in this study. Goiters may be diffuse, uninodeular, or multinodular. Most nontoxic goiters constituting the commonest type of thyroid gland disease are thought to result from
Figure 1. (a), (b) In this case, right site injury of the superior laryngeal nerve.

Figure 2. (a), (b) In this case, hypocalcemia was happened.

TSH stimulation secondary to inadequate thyroid hormone synthesis [6] [7] [8] [9]. The patients often complain of a pressure sensation in the neck. As the goiters become very large, compressive symptoms such as dyspnea and dysphagia ensue. Patients also describe having to clear their throats frequently [2].

Computerized tomography scan and ultrasound are useful imaging modality especially in complicated massive goiter, in delineating the degree of tracheal compression and deviation and establishing the extent of retrosternal extension [2] [10]-[15].

Most euthyroid patients with small, diffuse goiters do not require treatment [2]. The patients with large goiters; using exogenous thyroid hormone to reduce the TSH stimulation of gland growth; this treatment may result in decrease and/or stabilization of goiter size and is most effective for small diffuse goiters [2]. Endemic goiters are treated by iodine administration [1] [2] [3] [4]. Surgical re-
section is reserved for goiters that; continue to increase despite T₄ suppression, cause obstructive symptoms, have substernal extension, have malignancy suspected, and are cosmetically unacceptable. Nearly total or total thyroidectomy is the treatment of choice [2]. All the patients had substernal extension, and were undergone total thyroidectomy.

Treatment of large goiters is generally surgery. Total thyroidectomy is performed surgically [7]. The most important advantage of thyroid surgery for massively enlarged goiter being its immediate effect and complete resolution of obstructive symptoms [7]. Given an accomplished surgeon and good preoperative preparation, injuries to the recurrent laryngeal nerves and parathyroid glands occur in less than 2% of cases [7] [8] [9]. Adequate exposure and avoidance of injury to the recurrent laryngeal nerves and parathyroid glands are essential. The predominant operative complications were related to previously operated, the thyroid gland due to distorted and displaced anatomy. Moreover surgery for recurrent goiter carries a 10 fold higher complication rate with complications such as permanent hypoparathyroidism (3.4%), the external branch of the superior laryngeal neve palsy (20%) and recurrent laryngeal nerve palsy (8%) [15] [16] [17]. Two complications were happened in this study. Right site injury of the external branch of the superior laryngeal nerve was happened the one patient. By that time, nerve monitoring wasn’t used during thyroid surgery. Hypocalcemia was happened another one. In the two patients previously were undergone surgeries (subtotal thyroidectomy).

5. Conclusion

Thyroidectomy for a massively enlarged goiter is technically challenging. The surgical approach to such cases requires careful preoperative evaluation and planning. Especially using of intraoperative nerve monitoring may be prevented as neve injury complication in these difficult cases that previously had undergone surgery. Adequate exposure and avoidance of injury to the recurrent laryngeal nerves and parathyroid glands are essential.

Acknowledgements

This scientific paper was presented at the 20th National Surgery Congress 2016 Antalya Turkey.

Conflict of Interest

The author has no conflict of interest to declare.

References


Submit or recommend next manuscript to SCIRP and we will provide best service for you:

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.
A wide selection of journals (inclusive of 9 subjects, more than 200 journals)
Providing 24-hour high-quality service
User-friendly online submission system
Fair and swift peer-review system
Efficient typesetting and proofreading procedure
Display of the result of downloads and visits, as well as the number of cited articles
Maximum dissemination of your research work

Submit your manuscript at: http://papersubmission.scirp.org/
Or contact ss@scirp.org