

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

Fatin R. Polat^{1*}, 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

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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 1. Patients and clinical data.

Cases	1	2	3	4	5	6	7
Age	45	37	39	56	43	57	45
Sex	Female						
Living area	Semi urban area						
Duration of procedure	125 mn	120 mn	136 mn	103 mn	135 mn	105 mn	123 mn
Weight of glands removed	670 gr	600 gr	802 gr	625 gr	605 gr	820 gr	705 gr
Duration of neck swelling	18	17	30	15	17	20	21
Complication of surgery	No complications					lrn.sp.inj.	hypocalcm.
Retrosternal extension	Yes	Yes	No	Yes	No	Yes	Yes
Tracheal deformity	Yes						
Blood transfusion	No	Yes	No	No	No	No	No
Tracheal stenosis	Yes						No
Previous operation	No					Yes	

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 recommended.

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, uninodular, or multinodular. Most nontoxic goiters constituting the commonest type of thyroid gland disease are thought to result from

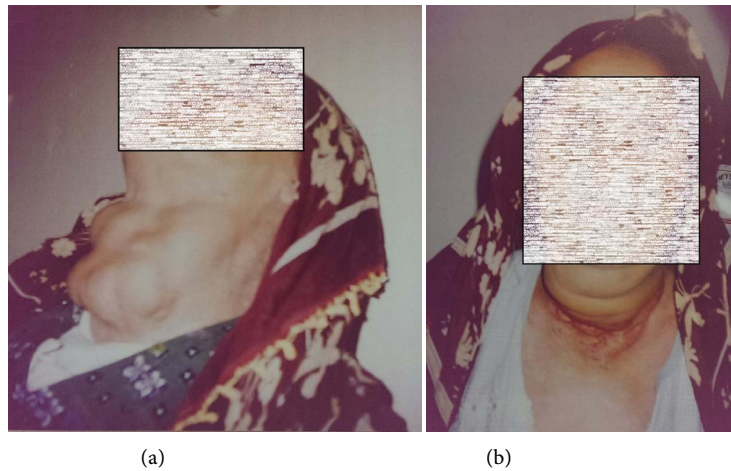


Figure 1. (a), (b) In this case, right site injury of the superior laryngeal nevre.

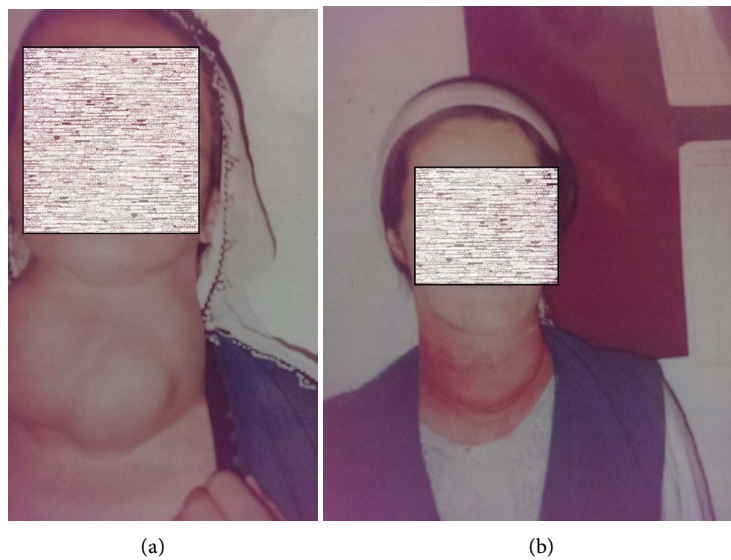


Figure 2. (a), (b) In this case, hypocalcemia was happened.

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 nerve 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 nerve 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.

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Conflict of Interest

The author has no conflict of interest to declare.

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