

Morbidity and mortality after total thyroidectomy for nonmalignant thyroid disorder: 10 years' experience

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Received 16 April 2016

Accepted 19 May 2016

The Egyptian Journal of Surgery
2016, 35:380–383

Background

In the last two decades of the 20th century, surgery for nonmalignant thyroid disease had changed from function-preserving surgery towards ablative surgery. This was due to higher recurrence rates of goitre (9–43%) and an increased risk for postoperative complications in reoperations after subtotal resection.

Patients and methods

This retrospective study included patients with nonmalignant thyroid disease who were referred and enrolled for total thyroidectomy from December 2004 to December 2014 in Sohag University Hospital, Egypt. Operation, anaesthesia, rescue analgesia and postoperative care were standardized. All patient records were reviewed for demographic data, indication for surgery, intraoperative complications, postoperative complications, histopathology and follow-up period.

Results

Between December 2004 and 31 December 2014, 180 patients underwent total thyroidectomy for nonmalignant thyroid disease at the General Surgery Department, Sohag University Hospital, Sohag, Egypt. Of them, 136 were female and 44 were male. Their ages ranged between 20 and 58 years. Primary total thyroidectomy was performed in 177 patients. Completion thyroidectomy was performed for three cases of recurrent goitre. Two patients who had postoperative bleeding returned to the theatre for haemostasis. No wound infection or recurrence was found in this study. Fourteen patients had postoperative hypocalcaemia (7.77%); 10 of them had temporary hypocalcaemia (5.55%) and four patients had permanent hypocalcaemia (2.22%). Eight patients had recurrent laryngeal nerve palsy (4.44%); seven of them were unilateral injurious. One patient had temporary bilateral recurrent laryngeal nerve injury. None of the patients had permanent bilateral recurrent laryngeal nerve palsy.

Conclusion

Total thyroidectomy is a valuable treatment option for nonmalignant thyroid disease. With no recurrence, complete cure of the diseases, and a lower complication rate.

Keywords:

nonmalignant thyroid, outcome, total thyroidectomy

Egyptian J Surgery 35:380–383
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1110-1121

Introduction

In the last two decades of the 20th century, surgery for nonmalignant thyroid disease had changed from functioning preserving surgery towards ablative surgery [1]. This was due to higher recurrence rates of goitre and an increased risk for postoperative complications in reoperations after subtotal resection [2]. Most surgeons avoid total thyroidectomy due to a high incidence of complications such as permanent recurrent laryngeal nerve palsy and permanent hypoparathyroidism, and subtotal thyroidectomy has been the preferred operation for benign thyroid diseases. However, recent studies have shown that the complication rates after subtotal thyroidectomy are similar to those following total thyroidectomy [3]. Moreover, with increased surgical experience, total thyroidectomy can be performed safely [4].

The aim of this study was to assess the complication rates of total thyroidectomy for nonmalignant thyroid disease.

Patients and methods

All patients were informed about the procedures, and written consent and ethics committee approval from Sohag university hospital's ethic committee were obtained. This retrospective study included 180 patients who underwent total thyroidectomy for benign thyroid disease from December 2004 to 31

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December 2014 in the General Surgery Department, Sohag University Hospital, Sohag, Egypt. All patient records were reviewed for demographic data, indication for surgery, intraoperative complications, postoperative complications, histopathology and follow-up period. All patients with malignant thyroid diseases were excluded. All patients were subjected to preoperative thyroid function evaluation, serum calcium evaluation, neck ultrasound, routine investigation and indirect laryngoscopy examination.

Surgical procedure

Total thyroidectomy was performed using an extracapsular technique as previously described [5]. Identification and preservation of both recurrent laryngeal nerves and parathyroid glands were carried out. Bilateral suction drains for 24–48 h in the thyroid bed were routinely used. Postoperative measurement of serum calcium in all patients was carried out every 24 h until patient discharge. All patients received hormonal replacement therapy in the form of levothyroxin for life. Before discharge, routine examination of the vocal folds by an otolaryngologist to detect any injury to the recurrent laryngeal nerves was carried out.

Follow-up

All patients were followed up at 1, 3, 6, and 12 months, and then every 5 years after surgery; at each visit, clinical examination and serum thyroid hormone and calcium evaluation were carried out.

Outcome measures

Recurrent laryngeal nerve status

The status of vocal folds of our patients was checked by an otolaryngologist just after surgery using a direct laryngoscope to assess the status of both laryngeal nerves. Temporary recurrent laryngeal nerve palsy was defined as hoarseness associated with vocal cord paralysis at laryngoscopy within 6 months postoperatively, whereas after 6 months we considered recurrent laryngeal nerve palsy to be permanent [6].

Parathyroid status

The function of parathyroid glands was checked immediately during the postoperative period and during follow-up by estimation of serum calcium concentration and parathyroid hormone level in some cases. Postoperative hypocalcaemia was considered when calcium level was lower than 8.0 mg/dl (reference range 8.2–10.2 mg/dl). Temporary hypocalcaemia was defined as a calcium level lower than 8.0 mg/dl in at least two consecutive samples (twice daily for 3 days). In these patients, hypocalcaemia resolved within days.

Conversely, in patients who were symptomatic and required vitamin D with or without calcium supplementation, we considered temporary hypocalcaemia to be severe when calcium levels remained lower than 8.0 mg/dl for more than 3 days. In these patients, hypocalcaemia resolved within 6 months. In patients who required vitamin D and calcium supplementation for more than 6 months, we considered hypoparathyroidism to be permanent [6].

Results

A total of 180 patients underwent total thyroidectomy for nonmalignant thyroid disease in the General Surgery Department, Sohag University Hospital, Sohag, Egypt. Of them, 136 were female and 44 were male. Their ages ranged between 20 and 58 years. Preoperative diagnosis is presented in Table 1. Primary total thyroidectomy was performed in 177 patients and completion thyroidectomy for three cases of recurrent goitre (one after hemithyroidectomy for multinodular goitre affecting single lobe, and two after subtotal thyroidectomy for Graves' disease).

All patients with Graves' disease received antithyroid drug plus nonselective β blocker for 12–18 months before surgery. A failed medical treatment, relapse and complication of therapy were the indication of surgery in these groups of patients. Moreover, patients with secondary toxic goitre returned to the euthyroid state before surgery. None of the patients died intraoperatively.

Two patients who had postoperative bleeding returned to the theatre for haemostasis. No wound infection or recurrence was observed in this study.

Fourteen patients had postoperative hypocalcaemia (7.77%); 10 of them had temporary hypocalcaemia (5.55%) and four patients had permanent hypocalcaemia (2.22%). Eight patients had recurrent laryngeal nerve palsy (4.44%); seven of them were unilateral injury. One patient had temporary bilateral recurrent laryngeal nerve injury. None of the patients had bilateral permanent recurrent laryngeal nerve palsy (Table 2).

Final histopathology is presented in Table 3.

Table 1 Patient's distribution as regards preoperative diagnosis

Diagnosis	n (%)
Simple nodular goitre	107 (59.44)
Secondary toxic goitre	46 (25.55)
Graves' disease	24 (13.33)
Recurrent goitre	3 (0.017)

Table 2 Postoperative complications

Postoperative complications	n (%)
Mortality	0 (0)
Recurrence	0 (0)
Bleeding	2 (1.11)
Hypocalcaemia	14 (7.77)
Temporary	10 (5.55)
Permanent	4 (2.22)
Recurrent laryngeal nerve injury	8 (4.44)
Unilateral	7 (3.89)
Temporary	4 (2.22)
Permanent	3 (1.66)
Bilateral	1 (0.55)
Temporary	1 (0.55)
Permanent	0 (0.0)

Table 3 Histopathological diagnosis

Final histopathology	n (%)
Graves' disease	24 (13.33)
Multinodular goitre	150 (83.33)
Hashimoto thyroiditis	6 (3.33)

Discussion

Many studies consider total thyroidectomy as the treatment of choice for Graves' disease, secondary toxic goitre and nontoxic multinodular goitre, particularly that affect both lobes [5–7]. Total thyroidectomy had many advantages such as removal of the risk of thyroid malignancy, no recurrence and rapid relief of the disease symptoms [8]. Although some studies reported higher rates of complications, other studies reported lower complication rates [5,6,9]. Moreover, less ablative procedure such as subtotal thyroidectomy has similar complication rates [1].

Our study showed that postoperative haemorrhage and haematoma formation were seen in two patients (1.11%) and is in accordance with many reports [5,6]. The rate of postoperative haemorrhage varied from 0.56 to 1.1% in many series [5,6,10,11], whereas others described their experiences of thyroidectomies with haemorrhage up to 2.5% [6].

In this study the incidence of both temporary and permanent hypocalcaemia was 7.77% and was comparable to that reported in another study, which reported an incidence ranging from 6 to 35%.

The incidence of hypocalcaemia depends on the type of surgery performed [6]. Previous papers reported that, after thyroidectomy for large multinodular goitre, temporary hypocalcaemia requiring calcium replacement occurred in 20% of patients and only up

to 3% of patients remained permanently hypocalcaemic [12,13]. Another study reported postoperative hypocalcaemia at a rate of 4.7% that persistent in 1.3% [6,14]. In our study, the rate of temporary hypocalcaemia was 5.5% and that for permanent hypocalcaemia was 2.22%; this was comparable to that reported in the previous studies.

Previous studies of same interest reported that the frequency of recurrent laryngeal nerve injury ranges from 0.5 to 5% in different thyroid surgery centres and increases in extensive surgical manoeuvres as in case of both recurrent goitre and total thyroidectomy due to thyroid cancer. The nerve lesion varies from irreversible, persistent, and transient dysfunction with good prognosis of complete recovery from several weeks to 2 years [5,6,15,16].

In the present study, eight (4.44%) patients had recurrent laryngeal nerve, one patient had temporary recurrent laryngeal nerve injury (0.55%), none of the patients had permanent (0%) bilateral recurrent laryngeal nerve injury, and four patients had permanent unilateral recurrent laryngeal nerve injury (2.22%).

Reeve *et al.* [17] postulated that surgical experience has a key role in reducing iatrogenic damage to the recurrent laryngeal nerves. Furthermore, the surgeon who has completed a well-designed training programme and who has become proficient as a trainee will remain proficient despite practising in a provincial hospital [18].

Although long-term dependency on levothyroxine for life is considered as one of the drawbacks of total thyroidectomy, the availability of levothyroxine replacement therapy makes patients who underwent total thyroidectomy survive with euthyroid function such that total thyroidectomy is a feasible management strategy for thyroid diseases [19–21].

Replacement therapy after thyroidectomy aims to restore thyroid function, avoiding oversubstitution and undersubstitution by beginning with an ideal dose of levothyroxine within 7 days after surgery [22,23].

Conclusion

Total thyroidectomy is a valuable treatment option for nonmalignant thyroid disease. With no recurrence, complete cure of the diseases and a lower complication rate.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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