Original Article

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Total Thyroidectomy for Benign Thyroid Disease: A Prospective Study

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Abstract

Background: The extent of thyroidectomy (subtotal to total) for benign thyroid disease was controversial till recent times. Theoretically, total thyroidectomy is a logical and optimal surgical procedure for benign thyroid disease affecting the entire thyroid gland as it has the advantage of immediate and permanent cure with no recurrence. Total thyroidectomy is currently the preferred treatment for benign thyroid disease. However, practically surgeons choose to avoid it and stick on to subtotal thyroidectomy due to the risk of damage to surrounding vital structures (parathyroids and recurrent laryngeal nerve [RLN]).

Aim of the Study: To evaluate the efficacy and safety of total thyroidectomy in the management of benign thyroid disease in terms of permanent complications, i.e., Hypoparathyroidism and RLN palsy.

Methodology: This prospective study was conducted on 236 patients in surgical unit of Mahatma Gandhi Memorial Hospital, Kakatiya Medical Collage, Warangal, Telangana, India, from October 2010 to November 2015. Patients with benign thyroid disease were operated with total thyroidectomy and results were analyzed.

Results: About 222 patients were without any post-operative complications (94.06%), and 15 patients were with different post-operative complications (6.35%). Six patients presented with post-operative transient hypocalcemia (2.54%). One patient remained as permanent hypoparathyroidism (0.42%). Two patients developed permanent unilateral RLN palsy (0.84%). One Patient developed hematoma due to reactionary hemorrhage (0.42%). No patient developed permanent bilateral RLN palsy (0%) and there was no mortality (0%).

Conclusion: Total thyroidectomy if performed by experienced surgeons is quite safe and preferred option for management of benign thyroid disease to avoid future re-occurrences.

Key words: Benign thyroid disease, Hypoparathyroidism, Recurrent laryngeal nerve palsy, Total thyroidectomy

INTRODUCTION

Thyroid surgery is the one of the common endocrine surgeries performed today. The thyroid gland is situated in a critical area in the neck surrounded by many vital structures (parathyroids and recurrent laryngeal nerve [RLN]). The complications related to the surgery were very high in the olden days. Hence, Germans and French initially called these operations "fool hardly performances." A magnificent surgeon "Theoder Kocher" reduced mortality of thyroid gland surgeries from 50% to <4.5%, and he advocated methodical surgical dissection of the thyroid gland. Theoretically, total thyroidectomy is a logical and optimal surgical procedure for benign thyroid disease affecting the entire thyroid gland as it has the advantage of immediate and permanent cure with no recurrence. Practically, surgeons choose to avoid it and stick on to subtotal thyroidectomy due to the risk of damage to surrounding vital structures. Now, there is a change in a surgical practice from sub-total thyroidectomy to total thyroidectomy for benign thyroid disease.[1] It was increasingly being done almost all over the world almost for the past 40 years.[2] The efficacy of total thyroidectomy being measured in terms of permanent complications,

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i.e., hypoparathyroidism and RLN Palsy. Currently, RLN palsy and hypoparathyroidism rates are evaluated in the literature between 1% and 4%, i.e., RLN palsy (1%) and permanent hypoparathyroidism (1-4%).

METHODOLOGY

Inclusion Criteria

Patients with benign thyroid disease (toxic and non-toxic multinodular goiters, large diffuse colloid goiters, Grave's disease)

Exclusion Criteria

Patients with malignant thyroid disease, patients with RLN palsy, patients with hypoparathyroidism, and patients with recurrent thyroid disease.

A total number of samplings (236 patients) were included in the study.

All the patients (n = 236) selected as per criteria from October 2010 to November 2015 were admitted in surgical unit-2 of Mahatma Gandhi Memorial Hospital, Kakatiya Medical College, Warangal, Telangana State, India, after Ethical Committee Approval and patient consent. All the patients were underwent pre-operative preparation including biochemical (T3, T4, and thyroid-stimulating hormone serum calcium), pathological (fine-needle aspiration cytology), radiological (ultrasonography and X-ray neck AP, lateral), ENT (indirect laryngoscopy [IDL]) and antithyroid drugs for toxic goiters. All the cases were operated with the procedure of total thyroidectomy by different surgeons of our team by collar incision and following standard methodological thyroid dissection as mentioned in the literature. Parathyroids identified and taken care of its blood supply (Figure 1). Recurrent laryngeal nerve and superior laryngeal nerve were safeguarded (Figure 2). Perfect hemostasis secured with care. Wound closed in layers after keeping suction drain. The immediate and delayed post-operative complications of all cases were recorded and analyzed.

RESULTS

About 236 (n = 236) patients were operated with the procedure of total thyroidectomy for benign thyroid disease. Out of 236 patients, 198 patients were females (83.89%) and 38 patients were males (16.10%). The age range was from 23 to 64 years with median age of 41 years. The operative procedure of total thyroidectomy was done for different types of benign thyroid diseases after necessary pre-operative preparation. 148 patients were with non-toxic multinodular goiters (62.71%), 50 patients were with large

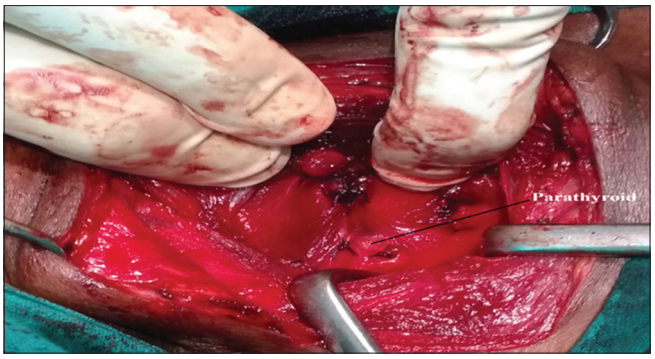

Figure 1: Parathyroid safeguarded

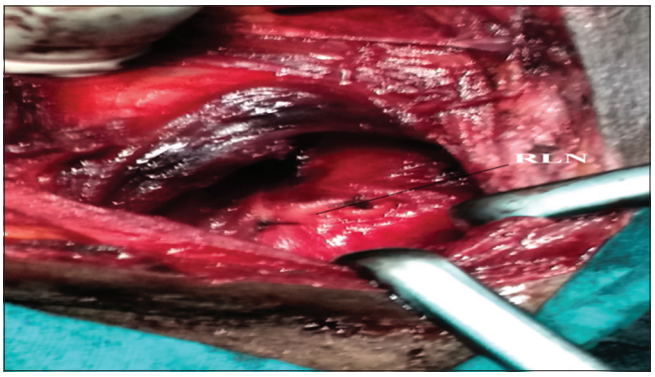

Figure 2: Recurrent laryngeal nerve safeguarded

discomfort diffuse colloid goiters (21.18%), 22 patients were with toxic multi-nodular goiters (MNG) (9.32%), and 16 patients were with primary thyrotoxicosis (Grave's disease) (6.77%). All the patients were operated and observed for post-operative complications. 222 patients were without any post-operative complications (94.06%), and 15 patients were with different post-operative complications (6.35%). 6 patients developed transient hypocalcemia (2.54%) which were treated immediately with intravenous calcium gluconate and followed by serial serum calcium levels and one patient remained as persistent hypoparathyroidism (0.42%), which was confirmed by serum parathormone levels. 4 patients had post-operative hoarseness of voice (1.69%), and they were followed by IDL. 2 patients recovered and another 2 patients remained as persistent unilateral vocal cord paralysis (0.84%). One patient developed a hematoma (0.42%), in which the patient had a history of trauma at thyroid region and profused bleeding during surgery due to the abnormal vasculature. The patient was treated with re-exploration and ligation of the bleeding vessel. No patient with bilateral vocal cord paralysis (0%), no patient with airway obstruction (0%), and no mortality (0%). Hypoparathyroidism and RLN palsy occurred in one single patient of huge thyroid (MNG) which was refused by all other surgical units of our hospital. Another RLN injury occurred while attempting the control of bleeding (Tables 1-3).

Table 1: Total thyroidectomy for benign thyroid disease

Benign thyroid disease	No of patients (236) (%)
Non-toxic MNG	148 (62.71)
Large discomfort diffuse colloid goiter	50 (21.18)
Toxic MNG	22 (9.32)
Primary thyrotoxicosis (Grave's disease)	16 (6.77)

MNG: Multinodular goiter

Table 2: Different complications after total thyroidectomy for benign thyroid disease

Name of the complications	No of patients (236) (%)
Patients without complications	222 (94.06)
Patients with complications	15 (6.35)
Transient hypocalcemia	06 (2.54)
Transient vocal cord paralysis	04 (1.64)
Persistent unilateral vocal cord paralysis	02 (0.84)
Persistent hypoparathyroidism	01 (0.42)
Bilateral vocal cord paralysis	None
Airway obstruction	None
Mortality	None

Table 3: Comparison of present and previous study results with permanent complications of hypoparathyroidism and unilateral RLN palsy in total thyroidectomy for benign thyroid disease

Name of the study	Permanent hypoparathyroidism (%)	Permanent unilateral RLN palsy (%)
Present study	0.4	0.8
Accetta *et al.*, 2011[3]	0.0	1.5
Barczynski *et al.*, 2011[4]	0.1	0.69
Guraya and Eltinay, 2007[5]	0.6	3.0
Chiang *et al.*, 2006[6]	3.7	1.86
Bron and O'Brien, 2004[7]	1.0	1.3

RLN: Recurrent laryngeal nerve

DISCUSSION

The extent of thyroidectomy (subtotal to total) for benign thyroid disease was controversial till recent times.[5] While doing sub-total thyroidectomy particularly for MNG, the surgeon commonly encounters that there is no apparently normal thyroid tissue remaining, so surgeon chooses to leave a small portion of abnormal thyroid tissue. This leaving behind a small portion of diseased thyroid tissue is unlikely to prevent the need of long-term thyroxine replacement therapy, whereas the attempt to suppress re-growth of that remaining thyroid tissue by thyroxine is not guaranteed. Hence, recurrent thyroid disease following sub-total thyroidectomy is a significant problem.[8] Re-operation for recurrent thyroid disease has increased the risk of either permanent hypoparathyroidism or RLN palsy.[9] Moreover, as per available literature, there is 30% risk of secondary thyrotoxicosis and 10% risk of follicular carcinoma thyroid in MNG. The incidence of permanent complications after total thyroidectomy varies considerably from center to center. However, the incidence is acceptably low in experienced hands. Apart from taking care of vital structures, practically total thyroidectomy is easier than sub-total thyroidectomy which avoids the struggle of leaving the tissue. Our study results were compared with other previous study results in Table 3, and our results are within their study limits of complications. Our study shows lower incidence of permanent hypoparathyroidism (0.42% vs. 3.7%) and RLN palsy (0.84% vs. 3%). Some other studies shown better results (0.42% vs. 0.0 and 0.84%) in terms of permanent complications. Total thyroidectomy can be preferred with minimal surgical complications. Here, we attained these acceptable results due to capsular dissection and ligation of multiple vessels.[10] The only argument against total thyroidectomy is the potential risk of complications; however, there is good evidence shows that with increase of experience the use of appropriate technique and quality of training total thyroidectomy can be preferred with minimal surgical complications.[11,12]

CONCLUSION

Total thyroidectomy for benign thyroid disease if performed by experienced surgeons with minimal permanent complications (hypoparathyroidism and RLN palsy) is quite safe preferred option for surgical management of benign thyroid disease to avoid future recurrences and increased risk of complications with re-operative surgery.

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