Original article:

Evaluation of total thyroidectomy for benign thyroid diseases

Dr. Darshil Rajgor[1], Dr. Niranjan Dash,[2] Dr. Jayant Gadekar,[3] Dr. Pravin Thorat[4]

[1] PG Resident , Dept. Of Surgery, D.V.V.P.F's Medical College & Hospital, Ahmednagar -414111

[2] Professor, Dept. Of Surgery, D.V.V.P.F's Medical College & Hospital, Ahmednagar -414111

[3] Professor & HOD, Dept. Of Surgery, D.V.V.P.F's Medical College & Hospital, Ahmednagar -41411

[4] Associate Professor , Department of Anaesthesioloy and critical care, DVVPF's Medical college & Hospital, Ahmednagar-414111

Corresponding author: Dr.Pravin S. Thorat

Abstract:

Introduction: Total thyroidectomy has been used to treat patients with malignant thyroid disease, but for patients with benign thyroid disease, the safety and efficacy of total thyroidectomy is a matter of debate. Subtotal thyroidectomy that was previously the treatment of choice for benign thyroid disease has been associated with high recurrence rates. The risk of permanent complications is greatly increased in patients who undergo surgery for recurrence of benign thyroid disease.

Aim: The intention behind this study was to evaluate the role of total thyroidectomy in patients with benign thyroid diseases in view of complications & recurrence.

Results: Most of the patients were in the fifth decade of their lives. The female to male ratio was 3.6:1. Total thyroidectomy was done for 60 benign thyroid diseases with multinodular goiter as the most common diagnosis. The incidence of postoperative hypocalcaemia was 11.66% (however, only 1 patient developed permanent hypocalcaemia) and that of wound infection was 1.66% and seroma formation was in 6.66% of cases. None of the patients included in this study had haematoma formation or permanent RLN paralysis. An incidental malignancy was identified in 11.66% patients.

Conclusion: Total thyroidectomy is an operation that can be safely performed, with low incidence of permanent complications, which allows one to broaden its indications in various benign thyroid diseases, thus avoiding future recurrences and reoperations.

Keywords: Benign thyroid diseases, Total thyroidectomy (TT), Subtotal thyroidectomy (STT), Near total thyroidectomy (NTT).

INTRODUCTION:

A variety of surgeries proposed to treat benign thyroid disease is a testament to the fact that the debate still goes on the most ideal surgery. The surgeries range from the more conservative sub-total thyroidectomy (STT) & near total thyroidectomy (NTT) to Total thyroidectomy (TT). Indications for surgery in these patients include cosmesis, compression related symptoms, hyperthyroidism and a suspicion of malignancy [1–3]. TT was suggested as a feasible modality of surgery for benign thyroid disease by Kocher a century ago [4].

Proponents of a more conservative approaches such as NTT & STT are substantiated by the potentially low incidence of complications like Recurrent Laryngeal Nerve (RLN) palsy and hypoparathyroidism along with the possibility of attaining a drug free postoperative euthyroid state in these patients [5]. However, there is a significant risk of disease recurrence in patients undergoing STT or NTT & they also require thyroxine supplementation.

Furthermore, complication rates are similar in both STT and TT with careful surgical technique [6–9]. A repeat thyroid surgery is a potentially nightmarish situation that every surgeon wishes to avoid [2,5,10,11]. The diagnosis of incidental malignancies of the thyroid on histopathology also favour the outcome of TT over STT or NTT.[12]

AIM: This study aimed to evaluate the role of total thyroidectomy in patients presented with presumed benign thyroid diseases.

METHODOLOGY:

A total of 60 patients who underwent TT for a condition diagnosed to be benign on preoperative work-up including cytology and imaging were prospectively studied from Jan 2015 to Jan 2016. Patients included in the study were those undergoing total thyroidectomy for benign thyroid diseases and were above the age of 18 years. Patients who were being operated for malignant thyroid diseases, who were undergoing completion thyroidectomy for recurrent thyroid disease or remnant malignant disease, those who were below the age of 18 years & those with abnormal thyroid function tests were excluded from the study. Patients were followed up for a minimum period of six months. The main parameters that were studied were the incidence of RLN palsy, hypoparathyroidism and disease recurrence. Also, the number of incidental malignancies that were found on postoperative histology but not detected on preoperative cytology was noted.

All patients underwent a preoperative evaluation with direct or indirect laryngoscopy to assess vocal cord movement. In addition, all had preoperative calcium level estimation and they were diagnosed with a combination of FNAC and ultrasonography of the neck. Informed and written consent was obtained from all patients participating in the study.

Operative technique:

The thyroid gland was approached through a kocher's incision. The strap muscles were split in the midline after the raising of superior and inferior sub-platysmal flaps. The dissection of the gland was initiated with the visualization of the superior parathyroid and the ligation of the superior pole of the thyroid gland. Dissection of the inferior pole was carried out close to the gland and branches of the inferior thyroid vessels were ligated. A minimum of two parathyroid glands were preserved in every patient with their vascularity intact. If a parathyroid gland was inadvertently injured or devascularized, it was re-implanted to the ipsilateral sternocleidomastoid muscle after frozen section confirmation. The gland was then dissected of the pre-tracheal fascia. The contra-lateral lobe was similarly approached. The gland was then delivered by dissection of the isthmus or pyramidal lobe. Closure was then done with a suction drain in situ. Postoperative intravenous antibiotics were given to all patients. The suction drain was removed on 2nd postoperative day. Patients if fit, were discharged on the fourth postoperative day.

All patients were monitored with serial measurements of the TSH levels, initially at two-month intervals and later at six-month intervals. The dose was adjusted such that the thyroid function was adequate and the TSH was within normal limits.

RESULTS

In this study, a total of 60 patients who underwent TT for diseases diagnosed to be benign were analysed. Of these, 47 were female (78.33%). Most of these patients were in the fifth decade of their lives. The

youngest of these patients was an 19-year-old girl and the oldest was a 64-year-old lady.

All of them were worked up for surgery and had benign diagnoses preoperatively. 44 patients were diagnosed to have MNG. 10 patients had nodular autoimmune Hashimoto's thyroiditis. 6 patients had a clinical and cytological picture fitting that of graves disease.

None of the patients had complications with respect to bleeding or haematoma formation. None of the patients had to be taken up for a re-operation. The most common complication encountered in this study was temporary hypoparathyroidism that was noted in 6 patients. In one patient, symptoms of hypocalcaemia persisted beyond six months and the patient was classified as having permanent hypoparathyroidism.

None of the patients in this study had permanent RLN palsy, however, three patients who had hoarseness of voice postoperatively were encountered. These were confirmed to be due to impaired movement of a vocal cord. Of these, two patients had palsy of the left sided vocal cord. All patients improved within a six-week period postoperatively.

Seroma formation was another complication that was encountered infrequently in this study. Four patients had seroma and were drained percutaneously. They improved without any further complications. Wound infection was noted in one patient & he was improved with oral antibiotic regimens which were started in accordance to the pus culture and sensitivity reports [Table/Fig-1].

Complications associated with total thyroidectomy in the present study [Table/Fig-1]

Complication	Number	Percentage
Bleeding	0	0%
Haematoma	0	0%
Seroma	4	6.66%
Wound infection	1	1.66%
Temporary hypoparathyroidism	6	10%
Permanent hypoparathyroidism	1	1.66%
Temporary RLN palsy	3	5%
Permanent RLN palsy	0	0%
Malignancy	7	11.66%

In this study group, 7 patients had incidental malignancy of the thyroid that was picked up on histopathological examination. These patients had preoperatively been diagnosed to have MNG in all patients (11.66%) on cytology. It is probably worthwhile to note that all 7 of these patients had undergone FNAC, which was done as a blind, office setting procedure, not under ultrasonic guidance. The most common malignancy was that of papillary carcinoma, followed by a mixed variant of both papillary and follicular carcinoma. Purely follicular carcinoma type picture was noted in one patient only [Table/Fig-2].

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Incidence of thyroid malignancy in the current study [Table/Fig-2]

	Number	Percentage
Total incidental malignancy	7	11.66%
Preop diagnosis of MNG	7	11.66
Incidence of Papillary Carcinoma	4	6.66%
Incidence of mixed variant	2	3.33%
Incidence of Follicular Carcinoma	1	1.66%

All these patients with incidental malignancy were in an age group of 40 to 60 years and all were female. All of them were euthyroid at presentation.

DISCUSSION

The role of TT for MNG and other benign diseases can be described best as controversial. The only substantial argument for not performing a TT in these patients is the previously reported higher incidence of complications with increasing extents of thyroid resections [4–7]. Many surgeons believe that TT is more preferable operation in these cases due to introduction of capsular dissection and increasing experience with it [13–18]. TT can be carried out with minimum morbidity among patients with benign thyroid conditions, including multinodular goitre and Graves disease, when surgery is indicated [19].

In our study, the most common complication occured was that of temporary hypoparathyroidism appeared in 10% of patients. Delbridge et al., concluded that following bilateral thyroidectomies, transient hypoparathyroidism must be an accepted outcome [20]. They also concluded that the incidence of temporary hypoparathyroidism increased with the extent of dissection, with highest incidence noted after TT. Other studies however, have reported

almost similar incidences of hypoparathyroidism with some even reporting rates lower in TT than for STT and NTT [7,15,21,22]. Efremidou et al., had reported 7.3% cases of temporary hypoparathyroidism & 0.3% cases of permanent hypoparathyroidism [19]. They also note that temporary hypoparathyroidism with hypocalcaemia is a complication that is managed relatively easily with medical therapy. This study also concurs with the above findings in that among all patients with hypocalcaemia, none of them required intensive care and all resolved spontaneously with supportive oral therapy following initial calcium infusions.

In our study, there was a single patient who developed permanent hypoparathyroidism and is on calcium and vitamin D supplementation. The rate of permanent hypoparathyroidism is 1.66% in this study. This is similar with results reported in other literatures [23,24].

In our study, there were no cases of permanent RLN palsy and 5 % patients developed temporary hoarseness of voice that eventually improved. Liu et al., & Reeve et al., have reported similar incidences [14,15]. The authors opine that careful identification of the RLN goes a long way in the prevention of RLN

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palsy and is potentially safer than leaving it hidden posteriorly under thyroid tissue. Also, the dissection is easier in TT as the field is comparatively less bloody due to better control of the vessels. In a TT all the vessels are ligated as compared to a STT or NTT wherein vascularized thyroid tissue is left behind with often less than optimum haemostasis. Efremidou et al., had reported 1.5% cases of temporary RLN palsy & 0.2% cases of permanent RLN palsy [19].

The other significant drawback with STT or NTT is that of recurrence and the need for a reoperation in cases of incidental malignancy. In our study rate of incidental malignancy was 11.66%. Efremidou et al., had reported 1.2% cases of incidental papillary carcinoma [19]. TT is a definitive surgery in these patients and in most cases obviates the need for a reoperation owing to the slow growing nature of well-differentiated thyroid cancers. It is universally agreed that there is a much higher rate of complications that occur in secondary thyroid surgeries especially when the gland has been dissected on both sides like for a STT or NTT. There are numerous studies that have proved this fact [4,5,25–27].

The previous custom of postoperative thyroid suppression with higher doses of levothyroxine is also now being applied with much caution. This has come from the realization of the fact that goiter is a heterogeneous entity with factors other than TSH that cause growth and that there is dissociation between growth and function in the gland that leads to an autonomous growth pattern [28,29]. This has led to reports of recurrence following lobectomy and sub-total thyroidectomy to the tune of even up to 45% [9,13,30]. In our study, mortality was 0% & there was no recurrence during follow-up period similar to other studies [21].

CONCLUSION:

Total thyroidectomy can be performed safely with a low complication rate. Many studies show no significant difference in view of postoperative complications (e.g., recurrent laryngeal nerve injury, hypoparathyroidism, recurrence) associated with total thyroidectomy compared with subtotal thyroidectomy or near total thyroidectomy. Moreover, complication rates decrease as the surgeons' skills increase. As a result, total thyroidectomy is now widely accepted for the management of benign thyroid disease.

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