

# Total Thyroidectomy Versus Subtotal Thyroidectomy In Multinodular Goitre— Our Experience

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## Abstract

**Introduction** Total thyroidectomy for the management of benign Multinodular goiter is controversial and since the development of other subspecialties, it adds to further confusion. The present study aims to retrospectively compare the efficacy and morbidity of total thyroidectomy and subtotal thyroidectomy. **Methods** A total of 170 patients with multi nodular goiter were assigned to have either total thyroidectomy (n=100) or subtotal thyroidectomy (n=70) based on preoperative evaluation, FNAC and indications for surgery. Complications and hospital stay were also noted. **Results** There was no significant difference in the rate of major complications between the two procedures. There was no significant difference in distribution of post operative complications among the groups. Temporary hypoparathyroidism resulted in 37 (22%) patients in total out of which 28 (28%) belonged to total thyroidectomy group and 9 (13%) belonged to the subtotal thyroidectomy group respectively which was statistically insignificant. No permanent or temporary recurrent laryngeal nerve palsy was noted. Hematoma 2 (3%) and stitch granuloma 3 (4%) was recorded in Subtotal group. Incidental papillary carcinoma was noted in 10 (6%) patients with total thyroidectomy. Recurrence was noted in 20 (29.8%) of patients and 7 were taken up for further surgery and the rest managed with L-Thyroxine. 80% of the total thyroidectomies were devoid of any complications as compared to only 54.28% of subtotal Thyroidectomies without complications. **Conclusion** Subtotal thyroidectomy provides an unpredictable outcome and the risk of permanent complications is not less than or at par with total thyroidectomy, so there appears little or none logical reason to recommend subtotal thyroidectomy. In our experience total thyroidectomy is radical but a definitive treatment method without the risk of recurrence with a small incidence of major complications as that of a less radical procedure.

## INTRODUCTION

Total thyroidectomy (TT) for the management of benign thyroid disorders is being increasingly accepted, although the indications are not well defined. All the treatment modalities have different types and incidences of morbidities. As a result, most surgeons have been looking for a treatment which results in the least recurrence and lowest complication rate. Many surgeons prefer Subtotal Thyroidectomy (ST) owing to the fact that the chances of permanent hypoparathyroidism are less and thought that lifelong medications are not required. As far as the fate of the recurrent laryngeal nerve is concerned, we believe the outcome varies from surgeon to surgeon. Contrary to the belief recurrence in Subtotal Thyroidectomy is not uncommon and completion surgery increases the risk of morbidity because of fibrosis. Thyromegaly apart from a neoplasia means that the gland is unable to produce enough hormones and it shows in the form of hyperplasia and after the surgery how it would be able to sustain the produce?

Total thyroidectomy on the other hand, managed by total replacement therapy, has no chances of recurrence and morbidity is on par with subtotal thyroidectomy.

## MATERIAL & METHOD

In the department of Otolaryngology, Pondicherry, India, a total number of 170 patients with Multinodular Goitre were considered for surgical management from Oct 2005 to Feb 2009. 160 (94%) were females and 10 (6%) were males. Age ranged from 21 to 44 years; mean age was 32.5 years ( tables 1, 2). 20 (12%) had breathing difficulties especially in the night and 80 (47%) had difficulty in swallowing ( table 3). These 100 (59%) patients with pressure symptoms were considered for total thyroidectomy and the rest 70 (41%) without pressure symptoms for subtotal thyroidectomy (table 4).

All the patients were completely informed regarding the possible outcome and complications and accordingly consent was obtained. Routine blood tests, along with thyroid

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function tests, thyroid ultrasonography, serum calcium and fine needle aspiration cytology were performed. 23 patients were found to be thyrotoxic for whom antithyroid medications were used before surgery to attain euthyroid state.

Indirect laryngoscopies as well as videolaryngoscopic examinations were performed to evaluate the vocal cord functions 24 hours prior to surgery, immediate post operative and 48 hours later, in all the patients.

Thyroidectomies were performed by a standard technique of extra capsular dissection. The TT technique involved the removal of the entire gland while in ST 25% of both lobes was left intact. We routinely avoid sharp instruments while tracing the nerve by using the brush technique. After identification of the recurrent laryngeal nerves (RLN), it was routinely traced till its entry to cricothyroid membrane. Superior and inferior thyroid vessels were ligated close to the gland and every attempt was made to identify and preserve the parathyroid glands and their blood supply. In case of known injury to the blood supply, which occurred in 11 (11%) patients who underwent TT, the parathyroid glands were dissected and implanted in the muscle. Wound was closed in layers and finger glove used as a drain. In the absence of any collection, the drain was removed on an average 2<sup>nd</sup> postoperative day and the patient was discharged on the 3<sup>rd</sup> day and was asked to report after 7 days for removal of the sutures.

All surgical specimens were routinely subjected to histopathology. Post operative serum calcium levels were estimated routinely after 48 hours of surgery and then subsequently as required. An assessment of symptom relief, RLN injury, transient hypocalcaemia and permanent hypoparathyroidism was noted. Post operative hypocalcaemia was defined as serum calcium level less than 8.2 mg/dl (normal range 8.2 – 10.1 mg/dl) in our laboratory. Hormonal replacement therapy was started postoperatively. A standard dose of 100 µg was administered to both the groups and thyroid function tests were monitored in an interval of 3 months. Based on their reports, titration of the dosage of L-Thyroxine was done.

**Figure 1**

TABLE 1: Age group of the patients

Age group	Total Thyroidectomy n=100	Subtotal Thyroidectomy n=70	Total
21-30 (**)	68	46	114
>30	32	24	56
range 21-44	100	70	170

\*= 10 patients had H/P report as papillary carcinoma

**Figure 2**

TABLE -2 Sex distribution of the patients

Sex of the patient	Total Thyroidectomy n=100	Subtotal Thyroidectomy n=70	Total
Male	7 (7%)	3 (4.28%)	10
Female	93 (93%)	67 (95.71%)	160

**Figure 3**

TABLE -3 Showing distribution of compressive symptoms

Compression symptoms	No of patients	Percentage
Difficulty in swallowing	80	47.06%
Difficulty in breathing	20	11.76%
Total	100	58.82%

**Figure 4**

TABLE -4 Showing distribution of procedure

Procedure	No of patients	Percentage
Total thyroidectomy	100	58.82%
Subtotal thyroidectomy	70	41.18%
Total	170	100%

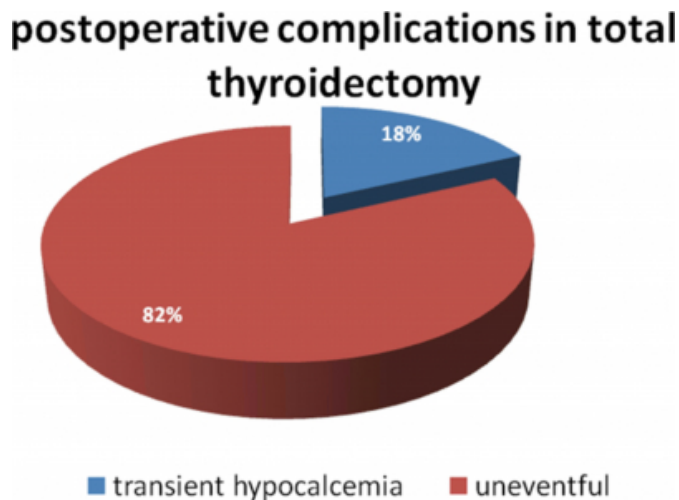
**Figure 5**

TABLE -5 various complications recorded

Post-operative complications	Surgical procedure		total n=170	p value
	Total Thyroidectomy n=100	Subtotal Thyroidectomy n=70		
Recurrent laryngeal nerve palsy	0 (0%)	0 (0%)	0 (0%)	-
Transient hypocalcaemia	18 (18%)	9 (12.85%)	27 (15.88%)	0.366
Hematoma	0 (0%)	2 (2.8%)	2 (1.78%)	-
Stitch granuloma	0(0%)	3 (4.28%)	3 (1.78%)	
Pain in the scar site	0 (0%)	18 (25.71%)	18 (11.76%)	0.001
Uneventful	82 (82%)	38 (54.28%)	120 (69.41%)	0.001
Total	100	70	170	-

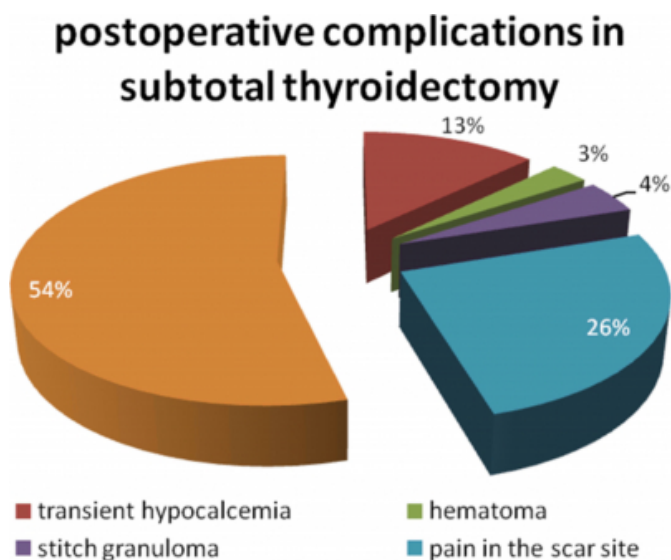
**Figure 6**

Figure 1: complications observed in total thyroidectomy group



**Figure 7**

Figure 2: complications observed in subtotal thyroidectomy group



**RESULTS**

The decision to do either a total thyroidectomy or subtotal thyroidectomy was based on the symptomatology, in compressive symptoms with massive multi nodular goitre involving both the lobes, total thyroidectomy was preferred and subtotal thyroidectomy in others. Bleeding during surgery was variable in both the groups since some of the glands were very vascular. Meticulous dissection was used to minimize the blood loss. We didn't use blood or blood fractions in any of the cases. We didn't record recurrent laryngeal nerve palsy, temporary or permanent in either of

the groups. No permanent hypoparathyroidism was recorded; however transient hypoparathyroidism was noted in 18 (18%) patients and 09 (12.85%) patients of TT and ST group respectively which was managed with calcium preparations. There was no significant difference in the two groups regarding the occurrence of temporary hypocalcaemia, p value= 0.366 (>0.05) {fig.1}.

02 (03%) patients were found to be having hematoma in ST group which was managed conservatively. Stitch granuloma was reported in 03 (04%) in ST group which could be attributed to defective suture material which too was managed conservatively. 3 months later 20 (28.5% ) patients complained pain at the sutured site which we considered to be some sort of neurogenic in nature and treated with local Inj.Triamcinolone successfully. Hematoma and stitch granuloma had no statistically significant difference in the two groups suggesting that they can occur in both groups equally, p value=0.134 (>0.05).

We don't have any control over the incidence of malignancies but incidental papillary carcinoma was noted in 10 (06%) patients, fortunately for us in TT group. No malignancy was found in ST group. Recurrence was noted in a short span of 2.5 years in 20 (29%) patients in ST Group. 07 were taken for further surgery and the rest managed with L-Thyroxine.

80% of Total Thyroidectomies were devoid of any complications when compared to only 54.28% of Subtotal thyroidectomies without complications, p value=0.001 (table 5 & Fig 2).

**DISCUSSION**

The surgical treatment of benign thyroid disease is still controversial although many surgical subspecialties have developed, each have many angles and views. Many treatment modalities have been advocated for the surgical management of Multinodular goiter i.e., total thyroidectomy, near total thyroidectomy, subtotal thyroidectomy, hemithyroidectomy, nevertheless clarity is missing regarding the safest and best option for the patients on a longer perspective. The indications for total thyroidectomy in the management of thyroid diseases are not well defined. The literature lists a few, like histories of head and neck irradiation, a Multinodular goiter grossly involving both the lobes, compressive symptoms and nodule with suspected malignancy. If the goiter is voluminous with compressive symptoms or if it is not possible to leave a grossly homogenous thyroid remnant tissue because of location of

possible nodules, total thyroidectomy is recommended<sup>(11)</sup>. There is a growing evidence that Total thyroidectomy is appropriate for patients with Multinodular goiter where there is significant nodular disease involving both the lobes<sup>(2,3)</sup>.

Subtotal thyroidectomy may be the best elective procedure in older patients to avoid total and permanent dependence on drugs<sup>(4)</sup>. Some authors favor the subtotal procedure because of its lower incidence of iatrogenic injuries such as recurrent laryngeal nerve palsy and hypoparathyroidism<sup>(5)</sup>. Injury to the recurrent laryngeal nerve (RLN) has a much greater impact and is more noticeable than superior laryngeal nerve injury. The incidence of permanent RLN palsy is approximately 01% to 01.5% for total thyroidectomy and less for near total procedures<sup>(6, 7, and 8)</sup>. Temporary dysfunction due to nerve traction occurs in 2.5% to 5% patients<sup>(9)</sup>. The incidence of permanent RLN injuries after subtotal and total thyroidectomies varied from 0% to 01% and 0% to 1.3% respectively<sup>(5, 10)</sup>. However we didn't record any incidence of RLN palsy, temporary or permanent and we agree with the literature that meticulous dissection and experience matters to safeguard the nerves.

Normal parathyroid glands most commonly are supplied by a single dominant artery (80%)<sup>(11)</sup>. In most instances, the superior and inferior parathyroid glands derive their dominant arterial blood supply from the inferior thyroid artery. Ligation of the inferior thyroid artery during surgery may not always compromise the blood supply to the superior parathyroid gland. Abundant arterial anastomoses exist between the parathyroid glands and include anastomoses with thyroid arteries and dominant arteries of the larynx, pharynx, esophagus and trachea. Transient symptomatic hypocalcaemia after total thyroidectomy occurs in approximately 07% to 25% of cases but permanent hypocalcaemia is less common (0.4% to 13.8%)<sup>(12, 13)</sup>. The risk of hypoparathyroidism is related to the size and degree of invasion of the tumor, pathology and the extent of the procedure and the surgeon's experience<sup>(14, 15)</sup>. Changes in serum calcium levels are often transient and may not always be related to parathyroid gland trauma or vascular compromise.

The morphologic features and the function of the thyroid gland, central neck dissection, experience of the surgeon and parathyroid auto transplantation does not influence development of post operative hypoparathyroidism. In our series, no permanent hypoparathyroidism was recorded; however transient hypoparathyroidism was noted in 18

(18%) patients and 09(13%) patients in TT and ST group respectively which is in the normal range as per the literature.

The goal of surgical treatment in MNG should be to eliminate the disease with a low complication rate and to minimize the necessity for reoperation because the risk of permanent complications has been found to be higher in reoperations for recurrent disease than in primary operations with extensive disease. If a surgeon leaves abnormal thyroid tissue in a patient with MNG, subsequent reoperation might be required<sup>(16)</sup>. Recurrence develops in as many as 14.55 of cases after subtotal resection, despite the prophylaxis; without suppressive therapy, the rate of recurrence increases to 43%<sup>(17, 18)</sup>. Ambrosi et al<sup>(19)</sup> found that recurrence was inversely related to the extent of the resection. Piraneo et al<sup>(18)</sup> reported a 395 recurrence rate after enucleation, 27% after lobectomy, 20% after lobectomy and contralateral enucleating excision, and 04% after subtotal resection. Recurrence rates after subtotal thyroidectomy vary as much as 14%<sup>(20)</sup>. Ozbas et al<sup>(21)</sup> reported administration of L-Thyroxine in all cases of partial and total thyroidectomy in their study. The use of L-Thyroxine supplementation has been suggested to efficiently prevent recurrence<sup>(22)</sup>. In our study, the recurrence was 29%, this we attributed to the compliance factor since patient think that once surgery is over, medications are not required any more.

The risk of damaging the RLN is far higher during a second intervention because of the anatomic disturbance with scar tissue left behind after the first surgery and the degenerative changes<sup>(23)</sup>. High rates of temporary (15.5% to 23.6%) and permanent (2.6% to 15.5%) damage of RLN have been reported in secondary thyroidectomy<sup>(8, 24)</sup>.

Recurrence of benign goiter requires surgical re excision, which carries a greatly increased risk of permanent complication<sup>(25)</sup>. At the same time, several studies have demonstrated that total thyroidectomy can be performed with a morbidity rate comparable to that for lesser procedures<sup>(26)</sup>. Other authors advocate total thyroidectomy because the incidence of iatrogenic injuries is similar to that of subtotal procedure, and there is no risk of recurrence<sup>(27, 28, and 29)</sup>.

Reoperations are undertaken if there is postoperative histologic evidence of thyroid carcinoma<sup>(30)</sup>. In our series, incidental malignancy was found on biopsy in 06% of cases that too, fortunately in TT group.

Equal rate of complications have been reported in TT and Partial thyroidectomies<sup>(25)</sup> which are consistent with the results of our study. This improvement in performing TT is related to routine identification of RLN, as advocated in recent decades<sup>(31)</sup>. Recently, a very comprehensive prospective quality assurance study of 5195 patients was performed to justify TT in the treatment of benign MNG<sup>(32)</sup>. Some researchers recommend 30 years of follow up to determine the actual outcome, most of the recurrences developed in 10 to 20 years after the primary surgery<sup>(33)</sup>. In our series, the follow-up period is very brief but significant recurrences are documented in the short span of time.

### CONCLUSION

Total thyroidectomy is a safe choice for the treatment of bilateral benign Multinodular goiter which provides a radical but definitive control of the disease, without the risk of recurrence. In experienced hand, it assures total relief of compressive symptoms and comparable low incidence of major complications.

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