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Original Research Article**Rationale for near total thyroidectomy in patients with nodular goitre****Rahul Lokhande, B.S. Gedam, Yunus Shah, Mrinal Tandon and Prasad Y. Bansod****Department of Surgery, NKP Salve Institute of Medical Sciences and Research Centre, Nagpur, India****Correspondence Info:**

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E-mail: Rabbu7288@gmail.com**Abstract****Aims:** To find out the results of near-total thyroidectomy in patients with nodular goitre with benign lesions.**Material and Methods:** A prospective study was carried out on 42 cases with nodular goitre at NKP Salve Institute of Medical Science & Research Centre and Lata Mangeshkar Hospital, Nagpur from October 2010 to October 2012.**Results:** In this prospective study of 42 cases with nodular goiter, clinically 29 patients had solitary thyroid nodule and 13 patients had multinodular goiter. Out of these 42 patients 35 (83.33%) were female and 7 (16.67%) were male with ratio of 5:1. The age of the patients ranged from 18 years to 65 years. In this study out of 42 patients, 3 patients had papillary carcinoma on FNAC and were treated by total thyroidectomy. 2 patients had colloid cyst and 7 patient had follicular neoplasm in which hemithyroidectomy was done. 30 patients were treated with near total thyroidectomy.

After near total thyroidectomy transient hypoparathyroidism was present in 7(23.33%) patients and transient recurrent laryngeal nerve palsy in 2(6.67%) patients. No patient had permanent recurrent laryngeal nerve palsy or permanent hypoparathyroidism.

Conclusion: Near-total thyroidectomy achieves a lower complication rate of hypoparathyroidism and a similar complication rate of recurrent laryngeal nerve palsy when compared with the rates reported in the literature for total thyroidectomy. It is an effective and safe surgical treatment option for various benign thyroid diseases.**Keywords:** Subtotal thyroidectomy (STT), near total thyroidectomy (NTT), and total thyroidectomy (TT), multinodular goiter, hypoparathyroidism**1. Introduction**

Many treatment modalities have been described for the surgical management of various thyroid diseases; including excision, subtotal thyroidectomy, near total thyroidectomy, and total thyroidectomy. However, surgery should always be based on the achievable benefits of the procedure and outweigh the potential complications.

The near total thyroidectomy offers an alternative to total thyroidectomy by performing a total lobectomy on dominant side and subtotal lobectomy on the contralateral side leaving behind nearly 1-2 g of thyroid tissue on the less affected side. It has been suggested that near-total thyroidectomy procedure combines the advantages of total thyroidectomy (no recurrence) with those of subtotal thyroidectomy (low incidence of transient and permanent hypoparathyroidism).[1-5]

Recent studies recommend near-total thyroidectomy in multinodular goiter instead of total or subtotal thyroidectomy. Though near-total thyroidectomy and total thyroidectomy obviate the need for completion thyroidectomy in incidentally found thyroid cancer, and there is no difference in the rate of recurrent laryngeal nerve palsy between the two methods, near-total thyroidectomy causes a significantly lower rate of hypoparathyroidism compared to total thyroidectomy. [6]

This study was undertaken to find out the results of near total thyroidectomy in nodular goiter.

2. Materials and Methods

From October 2010 to October 2012, 42 patients with goiter who underwent surgical treatment in this study at NKP Salve Institute of Medical

Science, Department of surgery, Tertiary care level rural hospital, Nagpur were included in this study.

All patients were evaluated by means of physical examination, thyroid function tests, thyroid ultrasonography. Fine needle aspiration cytology was performed from dominant thyroid nodules.

Antithyroid medications were used for hyperthyroidism before surgery to attain euthyroidism. All patients were subjected to indirect laryngoscopy pre operatively to determine the status of vocal cords and to rule out any cord palsy. These patients were subjected to definitive surgical procedures.

3. Results

In this prospective study of 42 cases with nodular goiter, clinically 29 patients had solitary thyroid nodule and 13 patients had multinodular goiter. Out of these 42 patients 35 (83.33%) were female and 7 (16.67%) were male with ratio of 5:1, the age of the patients ranged from 18 years to 65 years.

All 42 patients presented with swelling in neck. Symptoms associated with neck swelling are shown in Table 1.

Table 1: various symptoms associated with goiter

Clinical Features	No of Patients	Percentage (%)
Pain	3	7.14%
Difficulty in deglutition	3	7.14%
Difficulty in respiration	2	4.76%
Change in voice	2	4.76%
Palpitation	2	4.76%
Rapid increase in size	1	2.38%

Out of 42 patients in this study, 39 patients were euthyroid and 3 patients were hyperthyroid. No patient in this study of nodular goiter had hypothyroidism. (Table 2)

Table 2: Distribution of patients according to thyroid profile

Thyroid Profile	No. of Patients	Percentage (%)
Euthyroid	39	92.86 %
Hyperthyroid	3	7.14 %
Hypothyroid	0	0.00 %

In this study out of 42 patients, clinically 29 patients had solitary thyroid nodule. Out of these 29 patients, 12 (41.37%) patients had multinodular goiter on ultrasonography and Histopathological examination.

In this study, 3 patients had papillary carcinoma on FNAC and were subjected to total

thyroidectomy. 2 patients had colloid cyst and 7 patients had follicular neoplasm. These 9 patients were subjected to hemithyroidectomy. Out of those 7 patients of follicular neoplasm, 3 patients had follicular variant of papillary carcinoma on histopathology in which completion thyroidectomy was done. Rest of the 30 patients underwent near total thyroidectomy.

After near total thyroidectomy transient hypoparathyroidism was present in 7(23.33%) patients and transient recurrent laryngeal nerve palsy in 2(6.67%) patients. No patient had permanent recurrent laryngeal nerve palsy or permanent hypoparathyroidism.(Table 3)

Table 3: Distribution of patients according to postoperative complications after near total thyroidectomy

Post-operative Complications	No. of Patients	Percentage (%)
Transient Hypoparathyroidism	7	23.33%
Permanent Hypoparathyroidism	0	0.00%
Transient recurrent nerve palsy	2	6.67%
Permanent recurrent nerve palsy	0	0.00%
Wound infection	1	3.33%
Seroma Formation	0	0.00%

4. Discussion

In the recent years there has been a change in the surgical treatment of multinodular goiter with an increasing number of surgeons performing total or near total thyroidectomy. Since the clinical and pathophysiological evidence suggest that multinodular goiter affects the entire gland, any surgery that leaves potentially abnormal thyroid tissue in situ carries risk of recurrent disease.

Subtotal thyroidectomy involves removal of majority of the diseased thyroid tissue along with the isthmus leaving behind a remnant of roughly 4–8 grams on each side.[1-2]

Subtotal thyroidectomy has a major pitfall in that up to 40% of the cases have been reported in the literature to come up with recurrence in the long term follow up requiring a second surgery which has its own high morbidity.[3]

Total thyroidectomy for bilateral nodular goiter has become the preferred surgical approach in many centers. But the disadvantage of total thyroidectomy is the high incidence of hypocalcaemia due to parathyroid gland devascularization.[4]

We performed near-total thyroidectomy in 30 patients of nodular goiter. The objective of our study was the balance of leaving a small thyroid

tissue adjacent to the parathyroid glands with preservation of their blood supply to minimize the risk of complications, principally, permanent hypoparathyroidism. Meticulous surgical technique to preserve parathyroid circulation and recurrent laryngeal nerve are essential during near total thyroidectomy.

Clinically solitary thyroid nodule may be the dominant nodule in multinodular goiter. This may be due to non-palpable nodules which are less than 1 cm in diameter.[7]

In patients with differentiated thyroid cancer, total thyroid ablation can be achieved by near-total thyroidectomy plus ^{131}I , this result in the disappearance of thyroglobulin (TG) and thyroperoxidase (TPO) autoantibodies within 3 to 5 year.[8]

This study includes both solitary thyroid nodule and multinodular goiter. After near total thyroidectomy transient hypoparathyroidism was detected in 7(23.33%) patients and transient recurrent laryngeal nerve palsy in 2(6.67%) patients. No patient had permanent recurrent laryngeal nerve palsy and permanent hypoparathyroidism.

Karamanakos *et al*[9] studied that transient hypoparathyroidism was present in (21.5%) patients and transient recurrent laryngeal nerve palsy in (1.3%) patients after doing near total thyroidectomy.

Similarly the study conducted by Ozbas *et al*[5], the transient hypoparathyroidism was reported in (12.2%) patients and transient recurrent laryngeal nerve palsy in (0.6%) patients. In Acun *et al*[10] transient hypoparathyroidism was reported in (7.2%) patients and transient recurrent laryngeal nerve palsy in (6.6%) patients.

It is difficult to evaluate the results of thyroid surgery for benign disease mainly because of the long follow-up required for complete assessment of the outcome when there may be a delay of 20 or 30 years before recurrence.[11]

According to the literature, recurrence develops in as many as 14.5% of cases after subtotal resection, despite drug prophylaxis. The rate of recurrence increases to 43%. In cases without suppressive therapy [12,13]

When compared with primary thyroid surgery, secondary thyroidectomy after recurrence had an increased risk of complications, such as recurrent laryngeal nerve injury and hypoparathyroidism.[14] The risk of damaging the recurrent laryngeal nerve was far higher during a second intervention because of the anatomic disturbance with scar tissue degenerative changes.[15] High rates of temporary (15.5%-23.6%) and permanent (2.6% - 15.5%)

damage of the recurrent laryngeal nerve have been reported in secondary thyroidectomy.[16,17]

In most patients with non-neoplastic report on FNAC we performed near-total thyroidectomy; however, we found papillary carcinoma on histopathology in 1 patient. After near total thyroidectomy, the patient was given ^{131}I for residual small thyroid tissue to obviate reoperation for completion thyroidectomy.

An advantage of near-total thyroidectomy over subtotal thyroidectomy is that the thyroid remnant of about 2 g renders it accessible to ^{131}I ablation if cancer was found in the specimen and obviates reoperation for completion thyroidectomy.[18]

Permanent or temporary hypoparathyroidism was a well-known complication of total thyroidectomy. To compare complication reported in this study, especially transient hypoparathyroidism after near total thyroidectomy with that after total thyroidectomy, we used reports of total thyroidectomy published in the literature.[9,5]

The transient hypoparathyroidism after total thyroidectomy in studies published by Karamanakos *et al* [9] was 27.8% and in Ozbas *et al*[5] 30%.

5. Conclusion

- I. Near-total thyroidectomy achieves a lower complication rate of hypoparathyroidism and laryngeal nerve palsy when compared with the rates reported in the literature for total thyroidectomy. It is an effective and safe surgical treatment option for various benign thyroid diseases.
- II. In a patient of clinically solitary thyroid nodule in which USG is suggestive of multinodular goiter, we recommend near total thyroidectomy as a surgical treatment of choice.
- III. In a patient of thyrotoxicosis with nodular goiter, after making a patient euthyroid, we recommend near total thyroidectomy. The complete ablation may be achieved by ^{131}I in postoperative period, if indicated.
- IV. In a patient of clinically multinodular goiter with FNAC suggestive of non-neoplastic benign nodule, we recommend near total thyroidectomy.
- V. In a patient of multinodular goiter with FNAC suggestive of benign neoplasm, we recommend near total thyroidectomy. But after doing near total thyroidectomy if histopathology report turns out to be malignant, small residual thyroid tissue can be treated with ^{131}I to obviate reoperation for completion thyroidectomy.

References

- [1] Erdogan G, Erdogan MF, Emral R, Bařtemir M, Sav H, Haznedaroglu D *et al.* Iodine status and goiter prevalence in Turkey before mandatory iodization. *J Endocrinol Invest.* 2002; 25:224-8.
- [2] Mishra A, Agarwal A, Agarwal G, Mishra SK. Total thyroidectomy for benign thyroid disorders in an endemic region. *World J Surg.* 2001; 25:307-10.
- [3] Rosto L, Avenia N, De Palma M, Gulino G, Nasi PG, Pezzulo L. Complications of total thyroidectomy: Incidence, prevention and treatment. *Chir Ital.* 2002; 54(5):635-42.
- [4] Chaudhary IA, Afridi ZD, Samiullah, Masood R, Mallhi AA. To ligate or not the inferior thyroid artery to avoid hypocalcaemia after thyroid surgery. *J Ayub Med Coll Abbottabad.* 2007 Apr; 19(2):19-22.
- [5] Ozbas S, Kocak S, Aydintug S, Cakmak A, Demirkiran MA, Wishart GC. Comparison of the complications of subtotal, near total and total thyroidectomy in the surgical management of multinodular goiter. *Endocr J.* 2005 Apr; 52(2):199-205.
- [6] Erbil Y, Barbaros U, Salmaslioglu A, Yanik BT, Bozbora A, Ozarmağan S. The advantage of near-total thyroidectomy to avoid postoperative hypoparathyroidism in benign multinodular goiter. *Langenbecks Arch Surg.* 2006 Nov; 391(6):567-73.
- [7] Walker J, Findlay D, Amar SS, Small PG, Wastie ML, Pegg CA. A prospective study of thyroid ultrasound scans in the clinically solitary thyroid nodules. *Br J Radiol.* 1985; 58:617-9.
- [8] Chiovato L, Latrofa F, Braverman LE, Pacini F, Capezzone M, Masserini L *et al.* Disappearance of humoral thyroid autoimmunity after complete removal of thyroid antigens. *Ann Int Med.* 2003; 139:346-51.
- [9] Karamanakos SN, Markou KB, Panagopoulos K, Karavias D, Vagianos CE, Scopa CD, Fotopoulou V *et al.* Complications and risk factors related to the extent of surgery in thyroidectomy. Results from 2,043 procedures. *Hormones* 2010; 9(4):318-25.
- [10] Acun Z, Comert M, Cihan A, Ulukent SC, Ucan B, Karadeniz CG *et al.* Near-Total Thyroidectomy Could Be the Best Treatment for Thyroid Disease in Endemic Regions. *Arch Surg.* 2004; 139:444-7.
- [11] Khadra M, Delbridge L, Reeve TS, Poole AG, Crummer P. Total thyroidectomy: its role in the management of thyroid disease. *Aust N Z J Surg.* 1992; 62:91-95.
- [12] Pappalardo G, Guadalaxara A, Frattaroli FM, Illomei G, and Falaschi P. Total compared with subtotal thyroidectomy in benign nodular disease: personal series and review of published reports. *Eur J Surg.* 1998; 164:501-6.
- [13] Piraneo S, Vitri P, Galimberti A, Guzzetti S, Salvaggio A, Bastagli A. Recurrence of goiter after operation in euthyroid patients. *Eur J Surg.* 1994; 160:351-6.
- [14] Beahrs OH, Vandertoll DJ. Complications of secondary thyroidectomy. *Surg Gynecol Obstet.* 1963; 117:535-9.
- [15] Katz AD, Bronson D. Total thyroidectomy: the indications and results of 630 cases. *Am J Surg.* 1978; 136:450-4
- [16] Liu Q, Djuricin G, Prinz RA. Total thyroidectomy for benign thyroid disease. *Surgery* 1998; 123:2-7.
- [17] Reeve TS, Delbridge L, Brady P, Crummer P, Smyth M. Secondary thyroidectomy: a twenty-year experience. *World J Surg.* 1988; 12:449-53.
- [18] Menegaux F, Turpin G, Dahman M, Leenhardt L, Chadarevian R, Aurengo A *et al.* Secondary thyroidectomy in patients with prior thyroid surgery for benign disease: a study of 203 cases. *Surgery* 1999; 126:479-83.