



Comparison of near total thyroidectomy with subtotal thyroidectomy for multinodular goiter in terms of recurrence rate.

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ABSTRACT... Objective: To compare the outcome of NTT and STT for multinodular goiter in terms of Recurrence rate. **Study Design:** Experimental study. **Setting:** Department of Surgery DHQ Teaching Hospital Rawalpindi. **Period:** July 2016 to December 2017. **Material & Methods:** All patients were admitted through OPD according to the already set inclusion and exclusion criteria. Two groups were made first group was NTT group and second group was STT group. Patients were divided into two groups by lottery method (Probability sampling). Follow up period for recurrence was 1 year. Analysis of data was done by SPSS version -20. Chisquare test was used to see the statistical significance. Value of P was set at 0.05. **Results:** A total of 63 (n=63) patients were included in the study. Over all there were 71.40% females and 28.60% males. Average age of the female patients was 36.3 years and in males average age was 40.60 years. In NTT group there were 32 patients (n=32) and in STT group there were 31 patients (n=31). There was no recurrence in NTT group whereas recurrence was noted in 5 out of 31 patients (16.10%) in STT group which was found statistically significant ($p = 7.61$). Overall incidental carcinoma was noted in 6 out of 63 patients (9.52%). So completion thyroidectomy had to be carried in 4 patients of incidental carcinoma from STT group whereas 2 patients of incidental carcinoma from NTT group did not require any further treatment. **Conclusion:** Results of this study prove the superiority of NTT over STT regarding recurrence rate and safety of treatment for multinodular goiter. NTT eliminates recurrence rate of MNG which is very high in STT. NTT also obviates the need for completion thyroidectomy in case of incidental carcinoma.

Key words: Hypocalcemia, MNG, NTT, STT, Recurrence, RLNI.

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INTRODUCTION

Goiter is one of the common diseases in Pakistan especially in iodine deficient endemic northern hilly areas. It is not a single condition but a spectrum of conditions. It is of two types epidemiologically, sporadic and endemic. According to the definition it is endemic when its prevalence rate is 10% in population under consideration. Goiter is caused by iodine deficiency and ingestion of goitrogens (Thiocyanates and Thioglycosides) via food and water. MNG contains nodules of different sizes which may be dominant or solitary, cold (non-functioning) or warm (hyper functioning-Toxic) and once nodules are formed it is irreversible and ongoing process. Incidence rate of carcinoma is 4%-6.5% independent of nodule size in MNG of more than 10 years duration. As far as treatment

options are concerned surgery remains the mainstay. Different surgical procedures available in the tool kit of a surgeon for treatment of MNG are Total thyroidectomy (TT), Near total thyroidectomy (NTT), Subtotal thyroidectomy (STT) and Dunhill procedure (Hemi-thyroidectomy with subtotal thyroidectomy on other side) which have their own pros and cons but gold standard still is to be set and is continuously under evolution.

First total thyroidectomy was done by Theodor Kocher in 1909¹ before that it was contained by high mortality and non-availability of replacement therapy but after his success mortality was reduced from 50% to 4.5%. In NTT less than 1ml (2-4gm) of normal thyroid tissue is left behind near upper pole on each side where as in TT

virtually no thyroid tissue is left behind and in STT 4gm of normal thyroid tissue is left on each side. NTT is as effective as TT but more safe surgical option regarding RLN injury and hypocalcemia for treatment of MNG. There is high recurrence rate in STT and high chances of leaving carcinoma behind in remnant thyroid tissue. Whereas there is minimal difference in rate of recurrent laryngeal nerve injury and hypocalcemia between NTT and STT groups. These facts point towards the superiority of NTT over other procedures for goiter especially for bilateral and retrosternal disease causing pressure symptoms. Focus of this article is to judge whether NTT is a better surgical option than STT regarding recurrence of disease for treatment of non-toxic MNG.

OBJECTIVES

To compare the outcome of NTT and STT for multinodular goiter in terms of Recurrence rate.

MATERIAL & METHODS

This experimental study was conducted at department of surgery DHQ Teaching Hospital Rawalpindi. Present study was carried out from July 2016 to December 2017 over a period of 1.5 years after approval from ethical committee. A total of 63 (n=63) patients were included in the study selected by Probability sampling.

Inclusion Criteria

- All patients of 15 to 60 years age of either sex with MNG in whom thyroidectomy was indicated.

Exclusion Criteria

Patients with the following conditions were not included in the study.

- Thyroid malignancy.
- Grave's disease.
- Thyroiditis.
- Recurrent goiter.

All patients were admitted through OPD according to the already set inclusion and exclusion criteria. Patients with toxic symptoms were first treated according to the standard protocol to convert them to euthyroid state before surgery. Indirect laryngoscopy (IDL) for vocal cords and FNAC

to rule out carcinoma were done pre operatively for every patient. Two groups were made first group was NTT group and second group was STT group. Patients were divided into two groups by lottery method. Patients of first groups were treated by NTT and patients of second group by STT. There were 32 patients in NTT group and 31 patients in STT group. Follow up of the patients was for 1 year.

Data Analysis

Analysis of data was done by SPSS version -20. Percentages, means and rates were calculated. Chisquare test was used to see the statistical significance. Value of P was set at 0.05.

RESULTS

A total of 63 (n=63) patients were included in the study. Over all there were 71.40% females and 28.60% males. Average age of the female patients was 36.3 years and in males average age was 40.60 years. In NTT group there were 32 patients (n=32) and in STT group there were 31 patients (n=31). There was no recurrence in NTT group whereas recurrence was noted in 5 out of 31 patients (16.10%) in STT group which was found statistically significant ($p = 7.61$). There was no RLN injury in both groups. Transient hypocalcemia was noted in one patient in each group. Overall incidental carcinoma was noted in 6 out of 63 patients (9.52%). 4 patients of incidental carcinoma were found in STT group and 2 patients were in NTT group. So completion thyroidectomy had to be carried in 4 patients of incidental carcinoma from STT group whereas 2 patients of incidental carcinoma from NTT group did not require any further treatment.

The presenting symptoms were toxic MNG symptoms, cosmetic reasons, compressive symptoms and hoarseness due to either compression of RLN by a nodule or direct invasion by carcinoma. Most common were symptoms of toxic MNG (40%) followed by cosmetic reasons (35%) and compressive symptoms (20%). Least common was hoarseness (5%).

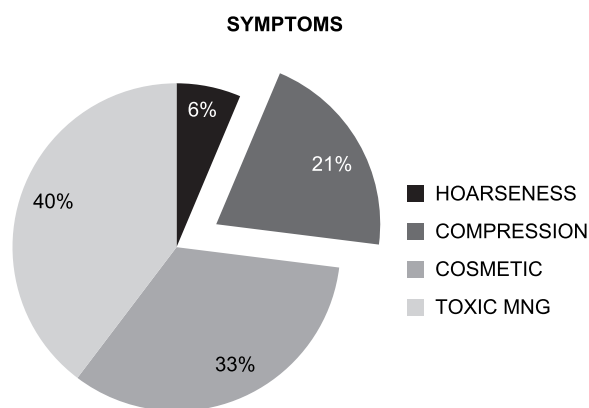


Figure-1. Presenting symptoms. n = 63

Recurrence	NTT (n=32)	STT (N=31)	P-Value
Present	0 (0)	5 (16%)	7.61
Absent	32(100%)	26 (84%)	

Table-I. Main outcome measure. n=63
Chi-square significance test was used to calculate p-value.

Complication	NTT (n=32)	STT (n=31)	P-Value
RLNI	0(0)	0(0)	0.00
Transient Hypocalcemia	1(3.13%)	1(3.23%)	0.0009

Table-II. Other main complications in two groups. n=63

N=63	NTT (N=32)	STT (n=31)	Total
Incidental Cacinoma.	2 (6.25%)	4 (12.90%)	6 (9.52%)
Completion Thyroidectomy.	0	4	4

Table-III. Incidental carcinoma and completion thyroidectomy.

DISCUSSION

Thyroid gland enlargement can be enormous (Mega goiter) especially in iodine deficient endemic areas which mainly cause two types of effects firstly pressure effects and secondly cosmetic effect besides disturbance of thyroid function. In Pakistan usually goiters are of long standing duration as people keep on delaying treatment due to number of reasons out of which poverty is commonest. It is now an established

fact that these long standing multinodular goiters may contain foci of carcinoma commonest being follicular. Like all other surgical procedures surgical options related to MNG also have morbidity and mortality attached with them. Main morbidities of MNG surgical procedures are Recurrent Laryngeal Nerve injury (RLNI), Hypocalcemia and of course most important the Recurrence of disease for which primarily the procedure was performed. It is here where comes the real test of choosing an appropriate surgical procedure out of the available armamentarium of surgical procedures (TT, NTT, STT) for MNG. An effective and safe procedure should be one which saves RLN, avoids hypocalcemia and has lowest recurrence rate of primary pathology. M. Raj Madan et al² in their article compared TT and STT methods of thyroidectomy and have come to the conclusion that although there is a bit higher complication rate in TT regarding RLNI and hypocalcemia as compared to STT but TT is more effective in treatment of MNG as recurrence of primary disease is almost eliminated. In their series 3 patients out of 20 (15%) had recurrence of disease after STT where as it was zero in TT group. M. Reza Mobayen³ declared in his work that due to the high incidence of malignancy in MNG Total Thyroidectomy should be the operation of choice. He also recommends TT as procedure of choice for bilateral and retrosternal disease causing pressure symptoms.

J. W. Serpell⁴ carried out a study to judge the safety of Total Thyroidectomy and after analysis of data of 336 total thyroidectomies concluded that by excising the pathology entirely TT lowers local recurrence rate and obviates the risks of reoperation, out of which recurrent laryngeal nerve injury is the most detrimental. So it can be clearly said that STT is not recommended for non-toxic multinodular goiter for reasons of leaving the disease behind and leading to high recurrence rates. As far as the other complications like RLNI, hypocalcemia and hypothyroidism are concerned there are studies which indicate that there is no significant difference of these complications among NTT, TT and STT. Michael Vaiman⁵ in his research work showed that recurrence rate was 21.5% in STT group

and 5.9% in NTT group whereas there was no statistically significant difference regarding other complications (RLNI and hypocalcemia) among NTT, TT and STT groups. According to him partial thyroidectomies do not show any advantage over total thyroidectomies regarding post-operative requirements of hormonal replacement therapy. So STT is associated with high recurrence rate leading to reoperation and increased risk of RLNI and other complications. In case of incidental carcinoma completion thyroidectomy has to be done again with increased complication risk. His study proves that NTT is the best thyroidectomy procedure for MNG as well as for confirmed removal of incidental carcinoma associated with it safely and effectively. Similarly the results of research work of Yesim Erbil⁶ published in 2006 are in favor of this study. He recommends near total thyroidectomy for multinodular goiter in place of total or sub-total thyroidectomy because there is no difference in the rate of RLNI between NTT and TT while rate of hypoparathyroidism (9.8% vs 26%) and asymptomatic hypocalcemia (7.4% vs 27%) is much lower in NTT than TT but both are better than STT regarding recurrence of primary disease and in obviating the need for completion thyroidectomy for incidental carcinoma.

Riju R. et al⁷ In their research article published in 2009 put aside STT in favor of total thyroidectomy, reason being the high recurrence rate in STT and the hazardous surgery in recurrent goiters. So all these studies reject STT and declare NTT/TT as right choice for multinodular goiter because STT has high recurrence rate and needs completion thyroidectomy for incidental carcinoma. As far as RLNI and hypocalcemia are concerned there are studies⁸ which state that they are comparable in both groups.⁹ M. Toluee¹⁰ and Ali M.¹¹ and Ciriochi R.¹² in their articles support the view of preferring TT in place of STT, for treatment of multinodular goiter explaining that total thyroidectomy obviates the need for redo surgery with associated high rate of RLNI and also ensures removal of carcinoma if present. Ciriochi after Meta-analysis of 1430 records with 1305 patients, states that NTT is supposed to be equally effective but safer than TT. The results of meta-analysis carried out by Li Y.¹³ discourage the use of STT for multinodular

goiter for reasons of high recurrence rate and need of completion thyroidectomy in case of incidental carcinoma although he reports higher transient hypoparathyroidism in TT that is what this study stresses upon that NTT is an alternative to TT to give full benefit of the surgery to the patient that is lowest recurrence and other complications (hypocalcemia, RLNI) rate.¹⁴ NTT has good quality of eliminating recurrence as is also true for TT but has very low RLNI and hypocalcemia as compared to TT.¹⁵

A study published by Haluk Unalp¹⁶ in 2008 supports the above recommendations of this study and clearly states that NTT has an advantage over TT in terms of post-operative hypocalcemia due to potential risk of injury to parathyroid glands in TT. Recurrent laryngeal nerve and parathyroid gland damage, as well as many fold decreased in NTT. Furthermore he establishes after comparison of NTT with STT that near total thyroidectomy eliminates the recurrence of MNG and the need for completion thyroidectomy in case of incidental carcinoma where as both of these issues are not catered for by STT. Acun Z.¹⁷ and Kbebew E.¹⁸ are also of same view that NTT is better choice than TT for treatment of goiter in terms of safety and recurrence.

CONCLUSION

This study proves beyond doubt the superiority of NTT over STT regarding recurrence rate and safety for treatment of multinodular goiter. NTT eliminates recurrence rate of MNG whereas STT has high recurrence rate leading to second operation with consequent high complication rate especially RLN injury. Near Total Thyroidectomy has the added advantage of obviating the need for completion thyroidectomy in case of incidental carcinoma although the rate of hypocalcemia and recurrent laryngeal nerve injury are similar in both procedures.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Sajid Rashid	Principal investigator, Wrote all parts of article. Did data collection and analysis.	