

ORIGINAL ARTICLE

RECURRENT LARYNGEAL NERVE INJURY IN TOTAL VERSUS
SUBTOTAL THYROIDECTOMYTahira Sajid, Syeda Rifaat Qamar Naqvi*, Syeda Saima Qamar Naqvi**, Irfan Shukr***,
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Background: Both Total and Subtotal Thyroidectomy are correct treatment options for symptomatic Euthyroid Multinodular Goitre. The choice depends upon surgeon's preference due to consideration of disadvantages like permanent hypothyroidism in Total Thyroidectomy and high chances of recurrence in Subtotal Thyroidectomy. Many surgeons believe that there is a higher incidence of Recurrent Laryngeal nerve injury in Total Thyroidectomy which affects their choice of surgery. This study aimed to compare the incidence of recurrent laryngeal nerve injury in total versus subtotal thyroidectomy. **Methods:** This non randomized controlled trial was carried out at Department of Surgery and ENT of Ayub Teaching Hospital Abbottabad, and Combined Military Hospital Rawalpindi from 1st September 2013 to 30th August 2014. During the period of study, patients presenting in surgical outpatient department with euthyroid multinodular goitre having pressure symptoms requiring thyroidectomy were divided into two groups by convenience sampling with 87 patients in group 1 and 90 patients in group 2. Group-1 was subjected to total thyroidectomy and Group -2 underwent subtotal thyroidectomy. All the patients had preoperative Indirect Laryngoscopy examination and it was repeated postoperatively to check for injury to the recurrent laryngeal nerve. **Results:** A total of 177 patients were included in the study. Out of these, 87 patients underwent total thyroidectomy (Group-1). Two of these patients developed recurrent laryngeal nerve injury (2.3%). In group-2 subjected to subtotal thyroidectomy, three of the patients developed recurrent laryngeal nerve injury (3.3%). The *p*-value was 0.678. The overall risk of injury to this nerve in both surgeries combined was 2.8%. **Conclusion:** There is no significant difference in the risk of recurrent laryngeal nerve damage in patients undergoing total versus subtotal thyroidectomy.

Keywords: Total thyroidectomy, subtotal thyroidectomy, recurrent laryngeal nerve injury

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INTRODUCTION

Recurrent laryngeal nerve (RLN) injury is one of the most important and preventable complications of thyroidectomy.¹ It is also one of the common reasons for litigation after thyroid surgery in the West.² Multinodular goitres which are euthyroid but with pressure symptoms are traditionally treated with subtotal thyroidectomy but trends are changing with more surgeons performing total thyroidectomy now.^{3,4} This trend is leading to lesser incidence of recurrent goitre which becomes very difficult to treat when it develops.⁵

However some studies suggest that there is a higher incidence of RLN injury in patients undergoing total thyroidectomy as compared to those undergoing subtotal thyroidectomy.⁶ Others have found insignificant difference in incidence of RLN injury in the two surgeries.^{7,15,17,20,21}

In Pakistan, most of the surgeons performing thyroid surgery for euthyroid benign multinodular goitre prefer doing subtotal thyroidectomy in order to avoid injury to recurrent laryngeal injury in spite of the potential risk of recurrence.⁸ But whether this surgery actually reduces the incidence of injury is controversial.⁹

Thus our study aimed to compare the incidence of RLN injury after total versus subtotal thyroidectomy in our setup.

MATERIAL AND METHODS

This non randomized controlled trial was conducted at surgical and ENT departments of Ayub Teaching Hospital, Abbottabad and Combined Military Hospital Rawalpindi after approval from Hospital Ethical Committees, from 1st September 2013 to 30th August 2014. Informed consent was taken from all the 177 patients who were included in the study. All these patients had preoperatively Indirect Laryngoscopy Examination. Out of them 87 patients were subjected to total thyroidectomy (Group-1) and 90 were subjected to subtotal thyroidectomy (Group-2) by convenience sampling. Randomization was not followed for allocation of the patient to the surgical technique. It was surgeon's subjective decision to allocate the patient to either of the group. All these surgeries were performed by consultants with at least five years' experience of doing thyroid surgeries. In all these surgeries efforts were made to identify RLN on both sides throughout their course. Surgeries for recurrent multinodular goitre or carcinomas

were not included in the study as these cases have increased risk of RLN damage. Patients found to have preoperative RLN palsy and those having lobectomies were also excluded.

Post operatively all the patients were examined by indirect laryngoscopy to check for RLN injury or otherwise. Data analysis was performed using computer software SPSS version 16. The *p*-value was calculated using chi square test. A value of less than 0.05 was considered significant.

RESULTS

A total of 177 patients (n=177) were included in this study, 87 in group 1 (total thyroidectomy) and 90 in group 2 (subtotal thyroidectomy).

Post operatively, one of the patients from group-1 who underwent total thyroidectomy expired within 5 hours of surgery. The cause of death was Myocardial Infarction. The RLN could not be assessed in this patient postoperatively so this patient was excluded from the study. Another patient from group-1 was excluded from the study because his post-operative histopathology showed carcinoma.

In group-1 (subjected to total thyroidectomy), patients' ages ranged from 24–63 years with a mean age of 42.70 years, SD=10.949 (Table-1). Male to female ratio in this group was 1:4.12. Two patients in this group had unilateral RLN injury. In one of these patients, RLN injury was recognized per operatively, which was repaired by a senior surgeon. Another patient who underwent total thyroidectomy was found to have unilateral RLN injury proven on indirect laryngoscopy. So percentage of proven RLN injury in group-1 was 2.3% (Table-2). In group-2 (subjected to subtotal thyroidectomy), patients' ages ranged from 27–68 years with a mean age of 46.76 years, SD=10.634 (Table-1). Male to female ratio in this group was 1:5. Three of the patients who underwent subtotal thyroidectomy developed hoarseness of voice postoperatively which was proven to be due to unilateral RLN injury on indirect laryngoscopy. So percentage of proven RLN injury in group-2 was 3.3% (Table-2).

None of the patients in our study had bilateral RLN injury. The overall risk of injury to this nerve in both surgeries combined was 2.8%. This data was analysed on SPSS version 16. The *p*-value was calculated using chi square test which came out to be 0.678. This indicates that the difference in incidence of RLN injury between patients undergoing total or subtotal thyroidectomy is statistically not significant.

Table-1: Ages distribution of total and subtotal thyroidectomy patients

Operation performed	Mean	N	SD	Age range
Total Thyroidectomy	42.70	87	10.949	24–63 years
Subtotal Thyroidectomy	46.76	90	10.634	27–68 years
Total	44.76	177	10.950	24–68 years

Table-2: Comparison of RLN injury in total and subtotal thyroidectomy patients

Procedure	RLN Injury			<i>p</i> -Value
	Injured	Not injured	Total	
Total Thyroidectomy	2 (2.3%)	85 (97.7%)	87	0.678
Subtotal Thyroidectomy	3 (3.3%)	87 (96.7%)	90	
Total	5 (2.8%)	172 (97.2%)	177	

DISCUSSION

Benign euthyroid multinodular goitres which cause pressure symptoms may be treated by subtotal or total thyroidectomy.¹⁰ Recurrent laryngeal nerve injury is an important complication of these surgeries.⁶ This nerve can be injured by traction, diathermy, loss of blood supply, transection, ligation, contusion etc. Depending on the type of damage, injury may be temporary or permanent¹¹. In our study we compared the incidence of this injury in total versus subtotal thyroidectomies.

We found that in group 1, out of 87 patients who underwent total thyroidectomy, 2 had RLN injury, i.e., 2.3%. There is a wide range of incidence reported by different authors in their studies with some reporting 0% RLN injury in their study¹², while others reporting high incidence of 7.2% after total thyroidectomy⁶. Ozbas S *et al*, in their study reported an incidence of 1.9%.¹³ Another study by Liu Q *et al*, reported an incidence of 2.8%.¹⁴ The incidence of RLN injury in my study is comparable to and within this range of incidences reported in world literature.

In group-2, three patients were found to have post-operative hoarseness, which was confirmed to be RLN injury by indirect laryngoscopy (3.3%). This is comparable to other studies which report an incidence between 0.9–6.3%.^{6,12,15,16}

Mean age of patients in our study undergoing total versus subtotal thyroidectomy was 42.70 and 46.76 respectively which is comparable to other studies comparing these two surgeries.^{12,17}

In our study, the female preponderance (M:F=1:4.5), is slightly less than other national (1:8)¹⁸ and international data (1:7.3)¹⁹. The reason for this was that part of the study was conducted at CMH Rawalpindi, where mainly soldiers are treated, so more male patients were operated.

In our study the difference in incidence of RLN injury between total and subtotal thyroidectomies was not significant (*p*=0.678). Very few studies show a significant difference between the two e.g. Zakaria HM *et al* reported RLN injury risk of 7.2% in total vs. 1.9% in subtotal thyroidectomies, *p*=0.024.⁶ But most of the literature search revealed no significant difference between the two surgeries in terms of damage to recurrent laryngeal nerve.^{7,15,17,20,21}

Our research, combined with the world data, indicate that the misconception that total thyroidectomy is associated with higher incidence of RLN injury, should change.

CONCLUSION

There is no significant difference in the risk of recurrent laryngeal nerve injury in patients undergoing total versus subtotal thyroidectomy for benign euthyroid multinodular goitre.

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