

**Research Article****Comparative Study on outcome of Near Total and total Thyroidectomy in  
Terms of Bilateral Recurrent Laryngeal Nerve injury**

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**ABSTRACT**

**Objective:**To compare the outcome of near total thyroidectomy versus total thyroidectomy in terms of bilateral recurrent laryngeal nerve injury.

**Materials & Methods:** Total 224 patients with patients with benign goiter, 20-60 years of age of both genders were selected. Patients with recurrent goiter, malignant goiter and hashimoto's thyroiditis were excluded. All selected cases were divided into two groups. In group A patients, near total thyroidectomy was performed while in group B patients, total thyroidectomy was performed. All patients were followed weekly for bilateral recurrent laryngeal nerve injury and final outcome (satisfactory/unsatisfactory) was noted at the end of 2 months post-operatively.

**Results:**The mean age of patients in group A was  $35.96 \pm 10.16$  years and in group B was  $36.10 \pm 10.42$  years. Out of these 224 patients, 153 (68.30%) were female and 71 (31.70%) were male with female to male ratio of 2.2:1. Bilateral recurrent laryngeal injury was seen in 04 patients in group A (near total thyroidectomy group) and 15 patients in group B (total thyroidectomy group) with p-value of 0.001. So, satisfactory outcome in Group A (near total thyroidectomy group) was 96.43% while in Group B (total thyroidectomy group) was 86.61% (p-value = 0.001).

**Conclusion:** This study concluded that that there is less bilateral recurrent laryngeal nerve injury after near total thyroidectomy compared to total thyroidectomy.

**Keywords:**Thyroidectomy, laryngeal, nerve, injury.

**INTRODUCTION:**

A goitre is a swelling of the neck or larynx resulting from enlargement of the thyroid gland (thyromegaly), associated with a thyroid gland that is not functioning properly. Goitre which is associated with hypothyroidism or hyperthyroidism may be present with symptoms of the underlying disorder. Goitre is treated according to the cause. If the thyroid gland is producing too much T3 and T4, radioactive iodine is given to the patient to shrink the gland.<sup>1</sup> If goitre is caused by iodine deficiency, small doses

of iodide in the form of Lugol's Iodine or KI solution are given. If the goitre is associated with an underactive thyroid, thyroid supplements are used as treatment. In extreme cases, a partial or complete thyroidectomy is required.<sup>2</sup> Thyroidectomy is an operation that involves the surgical removal of all or part of the thyroid gland. Surgeons often perform a thyroidectomy when a patient has thyroid cancer or some other condition of the thyroid gland (such as hyperthyroidism) or goiter.<sup>3</sup> Other indications

for surgery include cosmetic (very enlarged thyroid), or symptomatic obstruction (causing difficulties in swallowing or breathing).<sup>4</sup> Surgical options for the management of multi-nodular goiter include bilateral subtotal thyroidectomy, near total thyroidectomy (total lobectomy on the dominant side and a subtotal lobectomy on the contra-lateral side), and total thyroidectomy.<sup>5</sup> Complications of any surgical procedure are a sensitive measure of the quality. Reported complications following thyroid surgery are rare but their consequences can often be life-threatening as compared to the some other surgeries being performed routinely.<sup>6</sup> Recurrent laryngeal nerve (RLN) injury in thyroid surgery is one of serious complications as it may jeopardize the quality of life of the patient as hoarseness of voice, dyspnea and often life threatening glottal obstruction.<sup>7</sup> Mechanisms of injury to the nerve include complete or partial transection, traction, or handling of the nerve, contusion, crush, burn, clamping, misplaced ligature, and compromised blood supply.<sup>8</sup> Bilateral RLNI is much more serious, because both vocal cords may assume a median or paramedian position and cause airway obstruction and tracheostomy may be required. Accidental transection commonly occurs at the level of upper two tracheal rings, where the nerve closely approximates the thyroid lobe in the area of Berry's ligament.<sup>9</sup> Chaudhary IA et al<sup>10</sup> has shown recurrent laryngeal nerve injury in 2.94% patients after near total thyroidectomy and in 11.53% patients after total thyroidectomy. As recurrent laryngeal nerve injury is a major concern in thyroid surgery and methods that can reduce the incidence of this complication are of great interest and available literature on this was very scarce, therefore I had planned to conduct this study to compare the bilateral recurrent laryngeal nerve injury after near total versus total thyroidectomy. Then on the basis of these results, we could provide our patients with better technique in terms of less recurrent laryngeal nerve injury and this technique could be used as first line therapy in our routine practice guidelines

for these particular patients in order to improve their quality of life and reduce morbidity.

#### **MATERIAL AND METHODS:**

This randomized controlled trial was conducted in Department of Surgery, Sahiwal Medical College/Hospital Sahiwal from March 2017 to September 2017. All patients with benign goitre (as per-operational definition) of duration < 5 years, age 20-60 years, both genders were selected for this study. Patients with recurrent goiter, patients with malignant goiter, patients with sub-acute thyroiditis, patients with hashimoto's thyroiditis, patients not willing for the procedure, patients not willing to be included in the study were excluded from the study. Selected patients were randomly divided into two groups A and B. In group A patients, near total thyroidectomy was performed while in group B patients, total thyroidectomy was performed. All patients were followed weekly for bilateral recurrent laryngeal nerve injury and final outcome (satisfactory/unsatisfactory) was noted at the end of 2 months post-operatively.

#### **OPERATIONAL DEFINITIONS:**

**Benign Goitre:** presence of diffuse or nodular enlargement of thyroid along with raised or decreased free T<sub>3</sub> (normal values = 3.5 - 6.5 pmol/L), free T<sub>4</sub> (normal values = 10 - 23 pmol/L) and thyroid stimulating hormone (TSH) (normal values = 0.5 - 4.70 mIU/L) was deemed as positive.

**Outcome:** was measured in terms of bilateral recurrent laryngeal nerve injury at the end of 2 months post-operatively: It was considered as satisfactory if there was no recurrent laryngeal nerve injury (presence of all these i.e. hoarseness of voice, dyspnoea and fixation of vocal cords on laryngoscopy indicated injury), otherwise considered as unsatisfactory.

Data was analyzed by using SPSS version 18.

Mean and SD was calculated for numerical data.

Frequencies and percentages were calculated for categorical data.

**RESULTS:**

Age range in this study was from 20 to 60 years with mean age of  $35.99 \pm 10.22$  years. The mean age of patients in group A was  $35.96 \pm 10.16$  years and in group B was  $36.10 \pm 10.42$  years. In group A patients, near total thyroidectomy was performed while in group B patients, total thyroidectomy was performed. Satisfactory outcome was noted in 108 (96.43%) patients of study group A and 4 (3.57%) patients of study group B. Statistically significant difference of satisfactory outcome between the both groups was observed with p value 0.008. (Table 1) Selected patients were divided into 4 age group i.e. age group 20-30 years, age group 31-40 years, age group 41-50 years and age group 51-60 years. In age group 20-30 years, satisfactory outcome was noted in 38 (97.44%) patients and 36 (90.0%) patients respectively in study group A and B but the difference was not statistically significant with p value 0.175. In age group 31-40 years, outcome

was satisfactory in 34 (94.44%) of group A while 30 (88.24%) patients of group B but the difference was significant with p value 0.354. In age group 41-50 years, 24 (96.0%) patients of group A and 22 (84.62%) patients of group B found with satisfactory outcome and the difference was not significant with p value 0.172. In age group 51-60 years, 12 (100.0%) patients of group A and 10 (83.33%) patients of group B found with satisfactory outcome but the difference was not significant with p value 0.140. (Table 2) Outcome was satisfactory in 74 (98.67%) female patient of group A and 65 (83.33%) female patients of group B and the difference of satisfactory outcome between the both groups was statistically significant with p value 0.001. In 34 (91.89%) patients of group A and 32 (94.12%) male patients of group B found with satisfactory outcome but the difference statistically insignificant with p value 0.714. (Table 3)

**Table 1:** Comparison of Outcome between both Groups

OUTCOME	Group A (n=112)		Group B (n=112)	
	N	%	N	%
Satisfactory	108	96.43	97	86.61
Unsatisfactory	04	3.57	15	13.39

**Table 2 :** Comparison of outcome in both groups according to age of patients.

Age of patients (years)	Group A (n=112)		Group B (n=112)		P-value
	Outcome		Outcome		
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	
20-30	38 (97.44%)	01 (2.56%)	36 (90.0%)	04 (10.0%)	0.175
31-40	34 (94.44%)	02 (5.56%)	30 (88.24%)	04 (11.76%)	0.354
41-50	24 (96.0%)	01 (4.0%)	22 (84.62%)	04 (15.38%)	0.172
51-60	12 (100.0%)	00 (0.0%)	10 (83.33%)	02 (16.67%)	0.140

**Table 3 :** Comparison of outcome in both groups according to gender

Gender	Group A (n=112)		Group B (n=112)		P-value
	Outcome		Outcome		
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	
Female	74 (98.67%)	01 (1.33%)	65 (83.33%)	13 (16.67%)	0.001
Male	34 (91.89%)	03 (8.11%)	32 (94.12%)	02 (5.88%)	0.714

**DISCUSSION:**

Complications such as bleeding, hypoparathyroidism and Recurrent Laryngeal Nerve Injury (RLNI) represent nearly half of all

the complications of thyroid surgery.<sup>11</sup> The latter complication after thyroidectomy, although infrequently encountered, can jeopardize the quality of life.<sup>12</sup> In addition to the hoarseness that

occurs with unilateral RLNI, bilateral RLNI leads to dyspnea and often life-threatening glottal obstruction.<sup>13</sup> The incidence of RLNI has been found to be higher during re-explorations, Graves disease and thyroid carcinoma procedures.<sup>14</sup> RLNI is a major concern in thyroid and parathyroid surgery. Therefore, methods that can reduce the incidence of this complication are of great interest.<sup>15</sup> An almost certain way to ensure the integrity of the RLN is to always identify the nerve during all surgical procedure on thyroid and parathyroid glands.<sup>16</sup> We have conducted this study to compare the outcome of near total thyroidectomy versus total thyroidectomy in terms of bilateral recurrent laryngeal nerve injury.

In our study, bilateral recurrent laryngeal injury was seen in 04 patients in group A (near total thyroidectomy group) and 15 patients in group B (total thyroidectomy group) with p-value of 0.001. So, satisfactory outcome in Group A (near total thyroidectomy group) was 96.43% while in Group B (total thyroidectomy group) was 86.61% (p-value = 0.001). Chaudhary IA et al<sup>10</sup> has shown recurrent laryngeal nerve injury in 2.94% patients after near total thyroidectomy and in 11.53% patients after total thyroidectomy.

The incidence of permanent RLN palsy is approximately 01% to 01.5% for total thyroidectomy and less for near total procedures.<sup>17-18</sup> Temporary dysfunction due to nerve traction occurs in 2.5% to 5% patients.<sup>19</sup> The incidence of permanent RLN injuries after subtotal and total thyroidectomies varied from 0% to 01% and 0% to 1.3% respectively.<sup>20</sup> 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>21</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>22</sup>

#### CONCLUSION:

This study concluded that there is less bilateral recurrent laryngeal nerve injury after near total thyroidectomy compared to total thyroidectomy. So, we recommend that near total

thyroidectomy could be used as first line therapy in our routine practice guidelines for these particular patients in order to improve their quality of life and reduce morbidity.

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