

Study of Paralysis of Recurrent Laryngeal Nerve after Thyroidectomy

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ABSTRACT

Aim: This study was conducted using the technique of visualization of the recurrent nerves to assess the frequency of recurrent laryngeal nerve injuries in our setting.

Methods: A total of 80 patients were selected for this study after a purposive sampling technique. All adult patients, regardless of age and gender, undergoing total thyroidectomy or hemi-thyroidectomy with written informed consent were included in this research. The subjects who had previously undergone thyroid surgery were not encompassed in the study. The thyroid status and preoperative analysis were made biochemically, histo-pathologically and clinically using fine needle aspiration cytology. SPSS version 21.0 was applied for data analysis.

Results: The study involved 80 patients, 35 (43.8%) men and 45 (56.2%) women, and the proportion of male to female was 1.4: 2. The mean age was 46.1 years with 8.1 years standard deviation. The indications for thyroid surgery were different: solitary thyroid nodule (31.2%), multinodular goiter (47.5%) and thyroid gland carcinoma (21.3%). Some underwent a total thyroidectomy (52) and others had a hemi-thyroidectomy (28). The total incidence of recurrent laryngeal nerve injuries was unilateral and on right side in 3 cases (3.8%) established by fiber optic laryngoscopy (FOL). In both cases, the palsy was transient, as after six weeks of conservative treatment, these patients achieved full recovery of the paralyzed vocal cords.

Conclusions: This analysis demonstrated that surgical exploration of the recurrent laryngeal nerve prevents undesirable nerve injury and thus reduces the frequency of paralysis of vocal cords. Therefore, we recommend routine RLN dissection and identification to minimize its injuries.

Keywords: Recurrent laryngeal nerve, Injury, Vocal cords.

INTRODUCTION

Goiter is a common disease of the thyroid gland in most parts of the world. Among the various etiologies, the most common are multinodular goitre, colloid nodule, papillary carcinoma, benign thyroid cyst, medullary and follicular carcinoma, lymphoma and anaplastic carcinoma^{1,2}. According to the histopathological report, colloid nodular goiter was 52%, follicular adenoma 24%, autoimmune thyroiditis 6% in benign goiter, papillary cancer 66.66%, follicular cancer 22.22%, and anaplastic cancer 11.11% among malignant tumors³⁻⁴. Thyroidectomy is a commonly performed surgical procedure for the treatment of a variety of thyroid conditions and is measured as a safe method in a well-resourced facility⁵⁻⁶. There are certain complications that can be life threatening after thyroid surgery like hypoparathyroidism, recurrent laryngeal nerve injury (RLNI) and bleeding account for approximately 50% of overall complications of thyroid surgical treatment. The utmost frightening thyroid surgery complication is damage to the recurrent laryngeal nerve injury. RLN injury is the result of a clamping, severing or stretching due to insufficient anatomy knowledge, lack of experience and surgical skill, abnormal anatomy such as large multinodular goiter and cancer. A literature review showed that the incidence of RLN paralysis varies between centers, depending on the skills level in thyroid surgical procedure and the nature of the operation⁷⁻⁸. The accurate frequency of injury to RLN fluctuates extensively. There is a debate as to whether identifying RLN during surgery will have any effect on the frequency of nerve injury⁹⁻¹⁰. The identification of nerve during surgery reduced the incidence of nerve damage while doing thyroidectomy. This study was conducted using the technique of visualization of the recurrent nerves to assess the frequency of recurrent laryngeal nerve injuries in our setting.

METHODS

It was a cross-sectional study conducted at the ENT department of Naseer Teaching Hospital Gandhara Medical University, Peshawar and M. Islam Medical & Dental College, Gujranwala from August 2021 to January 2022. A total of 80 patients were selected for this study after a purposive sampling technique. All adult patients, regardless of age and gender, undergoing total thyroidectomy or

hemi-thyroidectomy with written informed consent were included in this research. The subjects who had previously undergone thyroid operation were not included in the study. The thyroid status and preoperative analysis were made biochemically, histo-pathologically and clinically using fine needle aspiration cytology. SPSS version 21.0 was applied for data analysis. All surgeries were performed by the experienced surgeons. The collection of data was carried out using a previously designed questionnaire. All surgical procedures accomplished throughout the study duration were assessed and various postoperative variants of recurrent laryngeal nerve paralysis were documented. Data analysis was performed using SPSS version 21.

RESULTS

The study involved 80 patients, 35 (43.8%) men and 45 (56.2%) women, and the proportion of male to female was 1.4: 2. The mean age was 46.1 years with 8.1 years standard deviation.

Table-1: shows distribution of gender and age

Patients' characteristics	(n=80)
Age (mean+ SD)	46.1±8.1
Sex (m/F)	35/45

Some underwent a total thyroidectomy (52) and others had a hemi-thyroidectomy (28).

Table-2: shows various types of surgeries performed

Type of surgery	Number
Hemithyroidectomy	28(35%)
Total thyroidectomy	52(65%)

The indications for thyroid surgery were different: solitary thyroid nodule (31.2%), multinodular goiter (47.5%) and thyroid gland carcinoma (21.3%).

Table-3: shows various types of thyroid disorders

Indication	Frequency	Percent
Multi nodular goitre (MNG)	38	47.5%
Carcinoma of thyroid gland	17	21.3%
Solitary thyroid nodule	25	31.2%

In all cases, recurrent laryngeal nerve (100%) was identified during surgery. No RLN variability was noticed in this research. The total incidence of recurrent laryngeal nerve injuries was

unilateral and on right side in 3 cases (3.8%) established by fiber optic laryngoscopy (FOL). In both cases, the palsy was transient, as after six weeks of conservative treatment, these patients achieved full efficiency of the paralyzed vocal cords.

Table-4: shows Types of RLN paralysis

Type	Number
Temporary paralysis	3(3.8%)
Permanent paralysis	0

DISCUSSION

Thyroidectomy is associated with many postoperative complications, and RLN damage is very common¹¹. In many cases, it cannot be predictable throughout the surgical procedure. In this research, the overall incidence of RLN damage in 3 cases was 3.8%. Particularly in patients who endured total thyroidectomy for carcinoma of thyroid; voice alteration and trauma were noted immediately after surgery established by fiber optic laryngoscopy (FOL)¹²⁻¹³. In both cases, the palsy was transient, as after six weeks of conservative treatment, these patients achieved full efficiency of the paralyzed vocal cords after 6 weeks of conservative treatment. A study of the results and complications of thyroid surgery in 1,351 Sudanese patients undergoing thyroidectomy. Saad et al reported the frequency of RLN injury as 2.0 (28 patients), with the incidence of 1.2% unilateral transient RLN paralysis¹⁴⁻¹⁵. Permanent paralysis of RLA was 0.5%, and temporary bilateral paralysis of RLN was 0.0%. In Wagner et al study involving 1,026 patients showed that the frequency of permanent and transient paralysis of RLN was 2.4% and 5.9%, correspondingly¹⁶. In Jatzko et al research of 804 cases showed that the frequency of permanent and transient paralysis of RLN was 0.5% and 3.6%, correspondingly¹⁷. In Sosa et al study of 5,860 cases showed that the prevalence of everlasting RLN paralysis was 0.9% and did not report any temporary RLN paralysis¹⁸. In a longitudinal analysis of a multicentre study, Rosato et al showed that the frequency of permanent and transient RLN paralysis was 1.0% and 2.0%¹⁹. In a study of 1,020 patients, Goncalves et al. showed that the prevalence of permanent and transient RLN paralysis was 0.4% and 1.4% while Mishra et al. showed the prevalence of RLN changes ranged from 0.0% to 13%²⁰⁻²¹.

In the study by Jamski J et al on RLN damage after surgery of thyroid in 2324 cases in the years 1994-1997 showed that postoperative different grades of RLN paralysis amounted to 9.0%, out of which permanent paralysis was noticed in 1.7% of cases²². Jung H et al examined more than 910 cases of paralysis of recurrent laryngeal nerve after thyroidectomy and found 93.1% had benign goitre and 1.7% have permanent RLN paralysis after surgery²³. Zakaria and Hazem M et al study on RLN in thyroid surgery at King Fahd Hospital in 2005-2015 found that unilateral postoperative RLN paralysis was 3.1%, of which 0.4% was everlasting, and postoperative bilateral RLN paralysis was 3%²⁴. Alimoğlu O et al examined 582 cases of RLN injury afterwards the thyroid surgical procedure and found that women (80%) were predominated over men (22%). They also showed that 30 cases have postoperative RLN paralysis, 5 of whom developed permanent paralysis²⁵. González Jesús Herrenz et al analysed complications after thyroid surgical procedure in 336 patients and demonstrated unilateral paralysis in 2.3%²⁶. Flynn, MD Michel B et al demonstrated 1% RLN paralysis in 91 patients in their analysis of local complications afterwards the surgical removal of thyroid cancer²⁷. Idris, Saad eldin et al. analyzed more than 84 patients of RLN injury during thyroid operation and found that women (85.20%) were more than men (16.10%), and the total incidence of injury to RLN was 1.3%. Some factors, such as the extent of the operation and disease, the skills of the surgeons, the amount of bleeding per operation, and the use of diathermy, may contribute to recurrent damage to the laryngeal nerve²⁸.

CONCLUSION

This analysis demonstrated that surgical exploration of the recurrent laryngeal nerve prevents undesirable nerve injury and thus reduces the frequency of paralysis of vocal cords. Therefore, we recommend routine RLN dissection and identification to minimize its injuries.

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