RESEARCH ARTICLE

RECURRENT LARYNGEAL NERVE IDENTIFICATION AND PRESERVATION IN THYROIDECTOMIES: OUR EXPERIENCE

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ABSTRACT

Vocal cord paresis or paralysis during thyroid surgeries is still continues to be one of major problems. Visual identification of the nerve is the gold standard of recurrent laryngeal nerve protection for all types of thyroid surgeries. The present prospective study was carried out to highlight a simple, safe, effective and less time consuming procedure of identification and preservation of recurrent laryngeal nerve. A total number of 120 patients were included in the study, 90 females (75%) and 30 males (25%), who underwent various thyroid procedures for benign 74 (61.7%) and malignant tumors 46 (38.3%). The mean age was 35 years (range, 14-80 year). Lobectomy was done in 74 (61.7%), total thyroidectomy was in 40 (33.3%) and completion thyroidectomy was done in 6 (5%) of patients. The commonest benign and malignant tumor was colloid nodule in 45 (37.5%) and papillary carcinoma in 40 (33.5%) respectively. The mean size of the tumor was 8.9cm ranging from 3.5-12.4cm, recurrent laryngeal nerve was identified in all cases in the upper most part of its course where it is very close to the gland and enters into the larynx. There were no transient or permanent paralysis of recurrent laryngeal nerve in this study.

INTRODUCTION

Thyroidectomy is one of the most common operations, particularly in countries where iodine deficiency is a common condition. Similarly management of thyroid tumors represents a significant workload for the modern head and neck oncologist. The morbidity created by a poorly performed thyroid gland operation can exceed the morbidity caused by leaving some thyroid lesions alone. Apart from post thyroidectomy hypocalcemia and hematoma, the recurrent laryngeal nerve paralysis is the most serious complication of surgery in benign and malignant thyroid disease. Although not all post-operative voice disturbances are related to surgical laryngeal nerve injuries, symptomatic RLN paralysis has been proved to be a major cause of impaired quality of life, besides being a frequent concern of litigation.

The recurrent laryngeal nerve on the right side approaches in thyroid gland from the starting point behind the first part of subclavian artery. It then lies relatively laterally in the first part of its course, but moves medially as it ascends towards the gland, just below the level of inferior thyroid artery, it comes to lie in its classical position of Tracheo-Oesophageal groove.

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In contrast to the first era of thyroid surgery and colleagues, surgeons have therefore sought attempts to try to determine if the nerve identification alone for protecting the nerve during surgery. Thomusch and colleagues independently advocated routine dissection and demonstration of the recurrent laryngeal nerve. The superiority of this approach has been documented by Hemann and colleagues, who reviewed thyroidectomies for benign disease from 1979 to 1991 (n=15865) and from 1991 to 1998 when visualization of recurrent laryngeal nerve was standard practice. The authors showed that risk for permanent recurrent laryngeal nerve damage in the former group was 1.1% but in the latter group in which visualization of the nerve was standard practice the risk of permanent damage decreased to 0.4%.

Review of literature shows the incidence of recurrent laryngeal nerve paralysis as 4.8% (total patients 20) in 1994, by Jatzko and colleagues, 7.6% (total patients 105) in 1997 by Kasemsuwan, 3.84% (total patients 418) in 2005 by Ayatac, 1.42% (total patients 318) in 2007 by Chaudhary, and 0.29% (Total=340) in 2010 by Hazem, M. Zakaria. Despite the decreasing trends, recurrent laryngeal nerve injuries continues to be frequent source of medical malpractice claims against surgeons. Surgeons have therefore sought attempts to try to reduce the injuries to recurrent laryngeal nerve. Recurrent laryngeal nerve monitoring is an attempt to reduce the risk of nerve injury during thyroid and parathyroid surgery. Fernstein first mentioned electromyography (EMG) use in diagnosing disorders of recurrent laryngeal nerve in 1946. Delgado were the first to use EMG intra operatively to identify facial nerve in 1979 but Breman and colleagues were first to publish their data on recurrent laryngeal nerve monitoring in 2001.

The use of this technology in thyroid surgery has been a much debated topic for years. No consensus exists regarding the intra operative nerve monitoring effectiveness in preventing the recurrent laryngeal nerve damage. Multiple papers have failed to prove with statistical significance that use of intra operative nerve monitoring during thyroid surgery decreases the rate of RLN Palsy and Paresis. A large prospective evaluation study by Dipple H et others showed that intraoperative nerve monitoring (IONM) helps during revision surgery, but researches have not proven IONM use to be more effective than nerve identification alone for protecting the nerve during surgery.

Drallée and colleagues assessed thyroidectomy in 3 groups; no recurrent laryngeal nerve identification, visual identification alone and visual identification plus IONM identification. They concluded that surgeons performing fewer thyroid operations or average, IONM decreased the number of paralysed nerves. However, further examination didn’t show any difference in recurrent laryngeal nerve injury rates in last two groups. Thomusch and colleagues showed in 2004 with 15,403 at risk nerves that IONM is an adjunct that may be helpful, but it should never replace the meticulous technique of surgeon.

In the present study also nerve identification was strictly followed in all cases and no temporary and permanent paresis was reported. The nerve was identified where it penetrates the larynx in all cases. The same point of identification was followed by Baryanan Vey Seller in their comparative surgery.

### DISCUSSION

Thyroid surgery is a technically specific surgery involving highly detailed anatomy. The recurrent laryngeal nerve is the most important structure at risk during thyroidectomies. Despite many advances in surgical techniques during the last several decades, the risk for recurrent laryngeal nerve injury during thyroid and parathyroid surgery has only declined, not disappeared. In contrast to the first era of thyroid surgery with Kocher and Billroth who tried to avoid exposure of the nerve Frank Lahey of Boston in 1938 and subsequently Riddell independently advocated routine dissection and demonstration of the recurrent laryngeal nerve. The superiority of this approach has been documented by Hemann and colleagues, who reviewed thyroidectomies for benign disease from 1979 to 1991 (n=15865) and from 1991 to 1998 when visualization of recurrent laryngeal nerve was standard practice. The authors showed that risk for permanent recurrent laryngeal nerve damage in the former group was 1.1% but in the latter group in which visualization of the nerve was standard practice the risk of permanent damage decreased to 0.4%.

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of methods of recurrent laryngeal nerve identification. Two different recurrent laryngeal nerve identification methods were used during thyroidectomies. The first method identified the nerve where it penetrates larynx following superior pedicle ligation and the second method traces the nerve in superior direction after locating it in the tracheo oesophageal groove. In the first group 19 patients underwent lobectomy and 48 total thyroidectomy, in the second group 42 patients underwent lobectomy and 80 underwent total thyroidectomies. Recurrent laryngeal nerve paralysis was not observed in group 1 where as 2 (1.56%) patients in group 2 developed permanent recurrent laryngeal nerve paralysis. The results are consistent with the present study.

Searching the recurrent laryngeal nerve in the tracheo oesophageal groove and following it where it enters the larynx requires more dissection and can lead to parathyroid devascularization which can cause ischemia and necrosis and lead to hypoparathyroidism. The superior-inferior approach to recurrent laryngeal nerve allows the surgeon reach to the region directly and involves less dissection. We observed the same in our study as well.

CONCLUSION

The use of visual nerve identification is safe, less time consuming, recurrent laryngeal nerve was identified in the upper most part of its course where it is very close to the gland and enters into the larynx. By this method no transient or permanent paralysis of nerve occurs in this study.

References