Recurrent Laryngeal Nerve in Thyroid Surgery: Is Routine Identification necessary?

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Abstract

Background: To assess the risk of recurrent laryngeal nerve palsy (RLNP) after thyroidectomy with and without routine identification of the recurrent laryngeal nerve (RLN) during the operation.

Methods: This quasi experimental trial was conducted in Surgical Department of Rawalpindi General Hospital from Jan 2005 - Dec 2006. One hundred patients who underwent subtotal thyroidectomy, were included in the study. There were 50 patients in each group (group A and group B), with and without routine identification of the recurrent laryngeal nerve (RLN) during the operation. Both groups were prospectively analyzed comparing post operative hoarseness.

Result: The mean age in Group A was 34.06 yrs S.D±7.55 and in Group B 31.8years S.D±7.54. In Group A 46(92%) were females while Group B 48(96%) were females. Incidence of postoperative hoarseness occurred in 4 % in both groups. 8 patients developed post operative RLN palsy. Complete recovery of RLN function was documented in all patients within 3 months of surgery. Recovery from temporary RLNP ranged from 3 days to 3 months (mean 4±2.5weeks). Overall incidence of temporary and permanent RLNP was 4.0% and 0%, respectively in both groups.

Conclusion: Though there is no significant risk of hoarseness with or without routine identification of RLN, surgeons should be aware of the variations and have a thorough knowledge of normal anatomy of RLN, in order to achieve a high standard of care. This will ensure the integrity and safety of the RLN in thyroid surgery

Key Words: Thyroidectomy, Recurrent Laryngeal Nerve, Hoarseness,

Introduction

The most frequent and unpleasant complication of thyroid surgery is permanent recurrent laryngeal nerve palsy (RLNP) resulting from intra operative damage1. It can happen during surgery because of direct mechanical damage with or without disruption. Delayed RLNP within hours to a few days after surgery is thought to be caused by pressure of edema or hematoma. Besides hoarseness, which also occurs in unilateral RLNP, bilateral RLNP leads to dyspnea and often to life threatening glottal obstruction. Therefore, methods that prevent recurrent laryngeal nerve palsies are of great interest.2, 3

Surgeons have long-described the various methods by which injury to the recurrent laryngeal nerve (RLN) can be averted during surgery. Most have avoided dissections in the close proximity to the RLN in order to prevent injury to it, so it is not surprising that the saying in the past was: “if the nerve is seen, it is injured4. More recently, surgeons have advocated the routine identification of the RLN and its dissection.5 The concept of routinely “encountering” the RLN and using the technique of capsular dissection has been advocated to avoid injuring the nerve.6

We conducted a study to determine whether identification of the RLN reduces the number of permanent recurrent laryngeal nerve palsies and how it influences the occurrence of temporary recurrent laryngeal nerve palsies by comparing it with non identification of RLN.

Patients and Methods

One hundred consecutive patients who underwent surgery for simple multinodular goiter in Surgical Department of Rawalpindi General Hospital, Rawalpindi were included in the study. They were divided into Group A and Group B each comprising 50 patients.

Surgery was initiated with a Kocher collar skin incision and flaps were elevated deep to the plane of the platysma. After exposure of the thyroid gland the middle thyroid veins were identified and ligated. The inferior thyroid artery was isolated and ligated. Therefore the superior thyroid artery could also be ligated.
In group A patients, the RLN was first explored superiorly to the inferior thyroid artery and then exposed in a stepwise fashion to the point where it entered the larynx behind the inferior cornu of the thyroid cartilage. In group B, RLN was not identified and technique of intra capsular dissection used to avoid injury to nerve.

In both groups, pre-operative laryngeal examination was done by indirect laryngoscopy. In the post operative period, integrity of RLN was checked by looking for the presence of hoarseness.

The data was entered and analyzed in the Statistical package for social sciences (version 11). Descriptive statistics i.e. mean and S.D were used to describe all continuous variables and percentage was used for categorical variables.

Results

The mean age in Group A was 34.06 yrs S.D±7.55 and in Group B it was 31.8years S.D±7.54.(Fig 1). In Group A 46(92%) were females while Group B 48(96%) were females. Incidence of RLNP leading to hoarseness was 4% in both groups with and without routine RLN identification (Table1).

The 95% confidence interval for relative risk was (0.26, 3.77) indicating risk of hoarseness after exposure of RLN and without exposure is same. Of 8 patients with hoarseness, all recovered from temporary RLNP within 12 weeks, with peak recovery occurring at 5-7 weeks. Recovery of the RLN took up to 3 months in both groups.(mean 4±2.5 weeks).as shown in Fig 2. No patient had permanent nerve palsy.

Fig. 2:- Recovery from nerve palsy

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Patients</th>
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<tbody>
<tr>
<td>Group A</td>
<td>4</td>
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<td>Group B</td>
<td>4</td>
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Table-1. Relative risk of hoarseness.

<table>
<thead>
<tr>
<th>Group</th>
<th>Hoarseness</th>
<th>No Hoarseness</th>
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</thead>
<tbody>
<tr>
<td>Group A</td>
<td>4</td>
<td>46</td>
</tr>
<tr>
<td>Group B</td>
<td>4</td>
<td>46</td>
</tr>
</tbody>
</table>

Discussion

Routine dissection and identification of the RLN during thyroidectomy might have been controversial in the past, but this approach is proposed by most surgeons today. Wade advocated that the RLN is very vulnerable and should not be visualized and touched. Bergamaschi demonstrated that temporary and permanent RLNP rates were not statistically different whether or not the RLN had been exposed. In the study of Wagner et al there was no statistically significant difference regarding RLNP rates with and without nerve exposure for total lobectomy. However, the risk of RLNP was 21% and the permanent palsy rate increased from 3.8% to 7% when the nerve was not exposed or identified. Most reports in the literature recommend visualization of the nerve, suggesting that this may decrease the permanent nerve palsy rate.

Karlan et al reported 1000 consecutive thyroid operations with complete nerve dissection but without occurrence of permanent RLNP. Mattig et al demonstrated decreased permanent RLNP rates (from 5.9% to 0.8%) after routine nerve identification.

In our study incidence of RLNP leading to hoarseness was 4% in both groups with and without
routine RLN identification and this temporary nerve palsy recovered within 12 weeks of surgery. No patient had permanent nerve palsy although different studies had rates varying between 0.8% – 5.9%. Our incidence of temporary RLN palsy is comparable to other studies (Table 2) although the sample size was small and the cases were of simple multinodular goiter while other studies have included patients with thyroid cancer and patients with reoperations in which chances of injury to RLN are greater. Also the RLN is more vulnerable to damage during secondary thyroidectomy. Martensson and Terins17 reported permanent RLNP in 14% of their reoperation patients. Behars and Vandertoll18 determined a permanent RLNP rate of 8% for patients who underwent 2 operative procedures for benign thyroid disease, and 22% for those who underwent 3 or more. Jatzko et al19 determined that the incidence of permanent RLNP increased from nil during primary operations for benign goiter to 7.5% for recurrent goiter. In our sample, no patient had re-operation.

### Table 2: Comparison with published results where R.L.N identified

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<tbody>
<tr>
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<td>5.2</td>
<td>4.3</td>
<td>4.8</td>
<td>4.9</td>
<td>4.0</td>
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<tr>
<td>Permanent</td>
<td>5</td>
<td>0.7</td>
<td>1.7</td>
<td>2.3</td>
<td>1.6</td>
<td>0.0</td>
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References