INTRODUCTION:

Recurrent laryngeal nerve is a branch from vagus nerve which supplies all intrinsic muscles of the larynx except cricothyroid and the mucous membrane below the level of the vocal cord. It also gives off cardiac branches near its origin and supplies the trachea, oesophagus and the inferior part of the pharynx. [1, 2]

At the root of the neck right recurrent laryngeal nerve arises from the vagus anterior to the first part of the right subclavian artery and curves backwards below and then behind it to ascend obliquely to the side of the trachea. Left recurrent laryngeal nerve arises from the left vagus on the left of the aortic arch, curves below it immediately behind the attachment of the ligamentum arteriosum and ascends to the side of the trachea or in the tracheo-oesophageal groove. The nerve then passes among the branches of inferior thyroid artery to the lobe of the thyroid gland and enters the larynx deep to the inferior border of the inferior constrictor muscle[3].

The recurrent laryngeal nerve is relatively “safe” within the tracheo-oesophageal groove[2]. When the recurrent laryngeal nerve lies in the para tracheal position, it is less protected and is more vulnerable to injury during the cauterization of the inferior thyroid veins, because the nerve lies closer to the inferior thyroid veins, when present in this position[4]. The latest procedures of outpatient short stay thyroid surgery and minimally invasive video assisted thyroid lobec-
tommy using laparoscope to avoid scar in the neck, require a very precise knowledge of the normal and variant anatomy. Hence a study of the recurrent laryngeal nerve and its variations was undertaken.

**MATERIALS AND METHODS:**

Recurrent laryngeal nerve were dissected in 20 embalmed cadavers from the department of Anatomy, Government Stanley medical college and 15 post-mortem en-bloc specimens, from the Institute of Forensic medicine, Government Stanley medical college.

The dissection was carried out according to the methodology prescribed in the Cunningham’s practical manual. The skin was incised, reflecting superficial fascia, platysma, deep cervical fascia and exposing the sternothyroid, omohyoid, sternomastoid, and the origin of the recurrent laryngeal nerve was noted. Its relation with the tracheo-oesophageal groove was observed. Statistical analysis was done using chi-square test.

**RESULTS:**

Out of 70 recurrent laryngeal nerves dissected, 2cms below the lower border of the cricoid cartilage it was noted that in the right side, the recurrent laryngeal nerve was para tracheal in position in 65.7% and within the tracheo-oesophageal groove in 34.3% of cadavers. In the left side, the RLN was found 37.2% in para tracheal position and 62.8% within tracheo-oesophageal groove. No para oesophageal position of the recurrent laryngeal nerve was observed in any of the sides. (Table-1, Bar Chart-1)

At 1cm below the lower border of the cricoid cartilage, the recurrent laryngeal nerves were found to lie most frequently within tracheo-oesophageal groove on both sides. The para tracheal position was greater on the right side. However, the para tracheal position of the right recurrent laryngeal nerve in this level was lesser than that in the previous level. (Table-2, Bar chart-2)

In the current study, at both levels, the Chi-square test showed statistically significant differences in the position of the recurrent laryngeal nerve between the right and the left side.

**BAR CHART-1**

<table>
<thead>
<tr>
<th>SIDE OF THE NECK</th>
<th>SEX</th>
<th>FREQUENCY</th>
<th>WITHIN THE TRACHEO- OESOPHAGEAL GROOVE</th>
<th>PARATRACHEAL POSITION</th>
<th>PARA OESOPHAGEAL POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIGHT SIDE</td>
<td>Male</td>
<td>25</td>
<td>10</td>
<td>15</td>
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<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td>2</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>LEFT SIDE</td>
<td>Male</td>
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<td>14</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>
DISCUSSION:

The present study was done in 35 cadavers from the Department of Anatomy & Institute of Forensic medicine, Government Stanley medical college, to observe the variations in the position of the recurrent laryngeal nerve in relation to the trachea-oesophageal groove.

The findings of the study have been found to correlate with most of the studies conducted in various set ups in India and other parts of the world.

In the right side, the recurrent laryngeal nerve was found in 23 out of 35 cadavers (65.7%) in para tracheal position and in 12 out of 35 cases (34.3%) within tracheo-oesophageal groove. In the left side, the recurrent laryngeal nerve was found 13 out of 70 cases (37.2%) in para tracheal position and in 22 out of 35 cadavers(62.8%) within tracheo-oesophageal groove. No para oesophageal position of the recurrent laryngeal nerve was observed. This is comparable with the description of HW Gray1, Berlin(1935) 5, John.E.Skandalakis et al.,(1976)6, AI-SalihiA.R..(1981)[7] and Haller study (2012)8 but not with the findings of Bowden(1955)9.

At 1cm below the lower border of the cricoid cartilage, the recurrent laryngeal nerves were found to lie most frequently within tracheo-oesophageal groove on both sides. The para tracheal position was greater on the right side. However the para tracheal position of the right recurrent laryngeal nerve was lesser in this level than that in the previous level. This is in conformity with Henry Gray’s description.

CONCLUSION:

The high risk position of the recurrent laryngeal nerve in the paratracheal position was seen in significant proportions on the right side at the level of 2cms below the lower border of the cricoid cartilage compared to the left side. A surgeon must be aware of this fact, while dealing with the inferior thyroid veins during thyroidectomies.

COMPETING INTERESTS.

None declared.

REFERENCES:


TABLE -2

RELATION OF THE RECURRENT LARYNGEAL NERVE WITH TRACHEO OESOPHAGEAL GROOVE:

1cm level below the lower border of the cricoid cartilage:

<table>
<thead>
<tr>
<th>SIDE OF THE NECK</th>
<th>SEX</th>
<th>FREQUENCY</th>
<th>WITHIN THE TRACHEA- OESOPHAGEAL GROOVE</th>
<th>PARATRACHEAL POSITION</th>
<th>PARA OESOPHAGEAL POSITION</th>
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</thead>
<tbody>
<tr>
<td>RIGHT SIDE</td>
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<td>18</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Female</td>
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<td>8</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>LEFT SIDE</td>
<td>Male</td>
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<td>23</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>


[8] Haller, Justin M-study; Clinical Relevant Anatomy of Recurrent laryngeal nerve. (2012) Vol.37; Issue 2; P 97-100; PMD 21540775