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Original Research Article

**Study of mode of entry of recurrent laryngeal nerve into the larynx - Cadaveric study****Rajashekhar Dunderaddy<sup>\*1</sup> and Sumana R<sup>2</sup>**<sup>1</sup>Department of Anatomy, Karnataka Institute of Medical Sciences Hubli (Karnataka), India<sup>2</sup>Department of Anatomy, Karuna Medical College Vilayodi, Palakkad 678103 Kerala, India**QR Code****\*Correspondence Info:**Dr. Rajashekhar Dunderaddy,  
Department of Anatomy,  
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Hubli (Karnataka), India**\*Article History:****Received:** 04/02/2017**Revised:** 26/02/2017**Accepted:** 28/02/2017**DOI:** <https://dx.doi.org/10.7439/ijbr.v8i2.3918>**Abstract**

The Recurrent laryngeal nerve being the main motor nerve of the larynx supplying all the intrinsic muscles of larynx except the cricothyroid, is extremely sensitive to trauma with slight traction of the nerve leading to either temporary or permanent paralysis of intrinsic muscles. It is extremely vulnerable to damage during the Thyroidectomy procedures leading to hoarseness of voice. During the present study more importance is given to the mode of entry of the Recurrent laryngeal nerve in to the larynx as extra laryngeal division of the nerve is seen more often than rare.

**Keywords:** Recurrent laryngeal nerve, Thyroidectomy, Extra laryngeal division of recurrent laryngeal nerves.**1. Introduction**

The Recurrent laryngeal nerve being the main motor nerve of the larynx supplying all the intrinsic muscles of larynx except cricothyroid, is extremely sensitive to trauma with slight traction of the nerve leading to either temporary or permanent paralysis of intrinsic muscles. It is extremely vulnerable to damage during the Thyroidectomy procedures leading to hoarseness of voice.

Recurrent laryngeal nerve passes under the lower border of inferior constrictor muscle of pharynx to enter the larynx behind the articulation of inferior cornu of the thyroid cartilage with the cricoids cartilage.

Recurrent laryngeal nerve may divide in to anterior and posterior branches before entering in to the larynx, seen in 1% of cases as noted earlier but recent studies say that it is around 25% being more frequent than rare. In few cases it can enter by piercing the inferior constrictor muscle.

**2. Material and Methods**

50 enbloc specimens procured from embalmed dead bodies from Department of Anatomy and detailed dissection was carried out on each specimen and the

Recurrent laryngeal nerve was traced on either side from below till it enters the larynx. The dried specimens were then painted first with the acetone and then with Camlin fabric paint lemon yellow colour for recurrent laryngeal nerve and its branches, Red colour is used for the Inferior thyroid artery and its branches for differentiation.

R- Represents Right side and L- represents Left side.

The numbering is done from 1 to 50.

**3. Observation**

In the present study it has been observed that 12 specimens on the right side and 6 specimens on the left side divide in to 2 branches before entering the larynx and both the divisions enter the larynx so that the extra laryngeal division of recurrent laryngeal nerve is more commonly seen than thought.

Mode of entry of recurrent laryngeal nerve in to the larynx  
**Type -1** passing below the inferior constrictor muscle is seen in 89.4% of cases

**Type -2** piercing the inferior constrictor muscle is seen in 10.5% of cases.

In the present study in 5 specimens, it was noted that the Recurrent laryngeal nerve divides in to 2 divisions one branch pass under the inferior constrictor muscle and the other branch enter by piercing the inferior constrictor muscle.

It was also observed in the current study that 81.5% of the cases the recurrent laryngeal nerve passed

below the lower border of inferior constrictor muscle of pharynx and in 18.4% of the cases the recurrent laryngeal nerve pierced the inferior constrictor muscle.

The division of the recurrent laryngeal nerve and the frequency of it piercing the inferior constrictor muscle is more commonly seen on the right side compared to the left.

**Figure 1: Photographs showing the division of recurrent laryngeal nerve before entry in to larynx**



#### 4. Discussion

Regarding the mode of entry of recurrent laryngeal nerve in to the larynx in the present study it was observed that on the right side 36/50 specimens the recurrent laryngeal nerve passed below the lower border of inferior constrictor muscle of pharynx and 14/50 specimens the

recurrent laryngeal nerve pierced the inferior constrictor muscle of the pharynx and on the left side 48/50 specimens the recurrent laryngeal nerve passed below the inferior constrictor muscle of the pharynx and 2/50 specimens the recurrent laryngeal nerve pierced the inferior constrictor muscle of pharynx.

**Type -1** passing below the inferior constrictor muscle is seen in 89.4% of cases

**Type -2** piercing the inferior constrictor muscle is seen in 10.5 of cases.

In the present study in 5 specimens, it was noted that the Recurrent laryngeal nerve divides in to 2 divisions one branch pass under the inferior constrictor muscle and the other branch enter by piercing the inferior constrictor muscle.

Similar study was done by Nader wafae in 1991 who describes the recurrent laryngeal nerves penetration into larynx as type 1 and type 2.

**Type 1** penetration the recurrent laryngeal nerve passing below the inferior constrictor muscle as observed in 68% of cases

**Type 2** penetration the recurrent laryngeal nerve pierced the inferior constrictor muscle as seen in 32% of cases.

It was also observed in the current study that 89.4% of the cases the recurrent laryngeal nerve passed below the lower border of inferior constrictor muscle of pharynx and in 10.5% of the cases the recurrent laryngeal nerve pierced the inferior constrictor muscle falling under type 1 and type 2 respectively.

Recurrent laryngeal nerve before entering the larynx divides into branches and then enters the larynx which was said to be rare, is now being proved more commoner than rare.

In the present study we have observed that 12/50 specimens on the right side and 6/50 specimens on the left side divides in to two branches before entering the larynx and both the divisions enter larynx. Thus making the frequency of extra laryngeal division of recurrent laryngeal nerve being 24% on the right side and 12% on the left side.

Gray's describes 8/32 specimens studied making to 25% of recurrent laryngeal nerves divides before entering larynx.

Paul in 1982 has conducted study on 153 recurrent laryngeal nerves in which he has found that total of 59 recurrent laryngeal nerves bifurcated before entering larynx out of which 29 on left side and 30 on right side which making the percentage to be 49.2% on the left side and 40.8% on the right side.

## 5. Conclusion

The recurrent laryngeal nerve more commonly divides before entering larynx approximately in 23.6% of the cases on both sides and is more commonly seen on the right side. The mode of entry of the recurrent laryngeal nerve in to the larynx.

**Type 1** passing below inferior constrictor muscle as seen in 89.4% of cases.

**Type 2** piercing inferior constrictor muscles as seen in 10.5% of cases.

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