Laryngeal Paralysis in Thyroidectomy and Diseases of the Thyroid Gland

Roy, Gardiner and Niblock (1956) agree with Bowden (1955) that there is an inherent risk of damage to the recurrent laryngeal nerves during thyroidectomy and they add that the risk is greatly increased in the presence of certain pathological conditions of the gland, of which the most important is the retrosternal prolongation of the lateral lobe.

Nerve artery relationship (Wade 1955) may be variable:
(i) Nerve superficial to the arterial trunk or its two divisions.
(ii) Nerve deep to its arterial trunk or its two divisions.
(iii) Nerve between the two main divisions.
(iv) Nerve between glandular branches of superior divisions.
(v) Nerve between glandular branches of inferior division.
(vi) Nerve between glandular branches of both superior and inferior divisions.
(vii) Anomalous nerve.

(viii) No inferior thyroid artery.

Causes of vulnerability may be:
(1) Arterial fixation or
(2) Fascial fixation: the nerve may be fixed to the goitre by the fork formed by a dividing artery, or by a facial envelope of the thyroid if this is well developed and the nerve lies within it.
(3) No apparent reason.
(4) Arterial fixation and tunneling.
(5) Fascial fixation and tunneling occasionally a symmetrical growth of the goitre encloses the nerve as if in a burrow or tunnel, and fixes it in position.

The mode of damage to the nerve:
The recurrent nerve may conceivably be damaged during thyroidectomy in several ways:
(1) Crushing,
(2) Compression in a ligature,
(3) Stretching,
(4) Division by a sharp instrument,
(5) Ischaemia following nerve exposure,
(6) Involvement in fibrous tissue following nerve exposure.

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The commonest mode of nerve injury is compression in a ligature either subsequent to crushing by a haemostat or during suture of the gland tissue and less frequently the nerve is divided by sharp instrument. Injuries through stretching of the nerve or due to ischaemia or involvement in fibrous tissue are probably extremely rare.

**Site of vulnerability:**

(i) The nerve may be endangered by displacement from its normal course either in an anterior or a lateral direction.

(ii) Vulnerability of the nerve occurs slightly more frequently in the upper third of its course than it does in the middle and lower thirds.

(iii) The danger point at the upper pole is between the thyroid tissue and trachea.

(iv) Nerve vulnerability due to arterial fixation occurs frequently at all three sites, but vulnerability due to fascial fixation rarely occurs away from the mid-thyroid region.

(v) If the goitre lies unusually low in the neck, the recurrent nerve may be endangered during ligation of superior thyroid vessels.

(vi) Below the inferior pole of the thyroid lobe the nerve may occasionally be ligated and divided as it lies in intimate relationship to the inferior thyroid veins.

It has been the experience of most observers that the right recurrent nerve is more often damaged than the left nerve during thyroid surgery (Coller, 1938).

**Incidence:**

P. H. Holinger (1955) has reported that unilateral paralysis occurs in 1.5% and bilateral paralysis in less than 1% of patients in whom thyroidectomy has been done. Fuez (1934) reported a series of 250 patients examined carefully, before and after operation with 7.6% incidence of organic paralysis due to operation. In a series of 504 patients, Mulligan reported that 32 patients or 6.3% incurred injury to

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**Percentage of Laryngeal Paralysis.**

| Total No. of new cases attended E. N. T. O. P. D. | 78,820 |
| Number of laryngeal paralysis | 150 |
| Percentage of laryngeal paralysis | 0.19% |
| Percentages of Laryngeal paralysis due to thyroidectomy and diseases of thyroid gland | 0.02% |
| Percentage of laryngeal paralysis due to diseases of thyroid gland and thyroidectomy in relation to total number of laryngeal paralyses from other disease— |  |
| Carcinoma Thyroid (7 cases) | 4.6% |
| Colloid goitre (3 cases) | 2.0% |
| Thyroidectomy (6 cases) | 4.0% |
| Nodular goitre 5 cases |  |
| Colloid goitre 1 case |  |

**Total:** 10.6%

(16 out of 150 cases of laryngeal paralysis)