

## Correspondence

### Communication between the superior cervical sympathetic ganglion and the inferior laryngeal nerve

Complex arborisations occurs between the inferior ganglion of the vagus nerve and the superior cervical sympathetic ganglion (Braeucker, 1923; Fick, 1926; Siwe, 1931; Hoffman, 1957). The superior cervical sympathetic ganglion sends branches to the internal and the external carotid arteries, the inferior vagal ganglion, the superior laryngeal nerve and the cervical nerves, and provides superior cardiac and thyroid branches as well as the trunk that descends directly to the middle and inferior cervical sympathetic ganglia. There are communications between the vagus nerve (laryngeal branches) and the superior cervical sympathetic ganglion (SCSG). Cannizzaro et al. (1991) and Zerilli et al. (1994) reported abnormalities of sympathetic function among the effects of injury to the superior laryngeal nerve during thyroid surgery. The interconnections between these various nerves are therefore of clinical importance. We document here a rare example of complex communication between the vagus nerve and the SCSG in dissections of 113 adult (78 male, 35 female) Japanese cadavers. Both sides were examined in 88 cases, the right only in 18 and the left only in 7 (i.e. 201 sides in total).

In the communication between the inferior laryngeal nerve (ILN) and the internal laryngeal nerve (ITLN), a branch from the ILN arborised directly with ITLN in 53.7% of the 201 sides and other branches of the ILN ascended to the posterior cricoarytenoid, oblique arytenoid and transverse arytenoid muscles. A few communicating branches between the inferior vagal ganglion and the SCSG were found in 53.7% of the 201 sides. On the right side of 1 cadaver (an 82-y-old female) there was a communication between the ILN and the SCSG. The SCSG supplied a few branches to the internal and external carotid arteries; the main trunk descended along the course of the common carotid artery with small branches to the lateral side of this artery. The SCSG supplied a branch to the thyroid gland, and the cervical and the cervical sympathetic trunk formed 2 divisions at the upper part of the thyroid gland. One branch descended directly along the surface of the thyroid gland and finally connected with the ILN. The other branch from the SCSG descended to the aortic arch. The external branch of the ILN ascended to the thyroid gland. Two or 3 branches from the nerve supplied the posterior cricoarytenoid muscle and the superior region of the trachea. The internal laryngeal nerve inserted directly into the thyroid membrane. The external laryngeal nerve supplied small rami to the common carotid artery and descended to the cricothyroid muscle (Fig.).

Communication between the superior and inferior laryngeal nerves has been recorded in 3 of 19 (Nordland, 1930) and 10 of 12 cases (Lemere, 1932). In our cases, such communications were found in 53.7% of the 201 cases. There are various communications of the SCSG with the inferior vagal ganglion. The SCSG supplies many branches which arborised with branches of the vagus nerve. Siwe

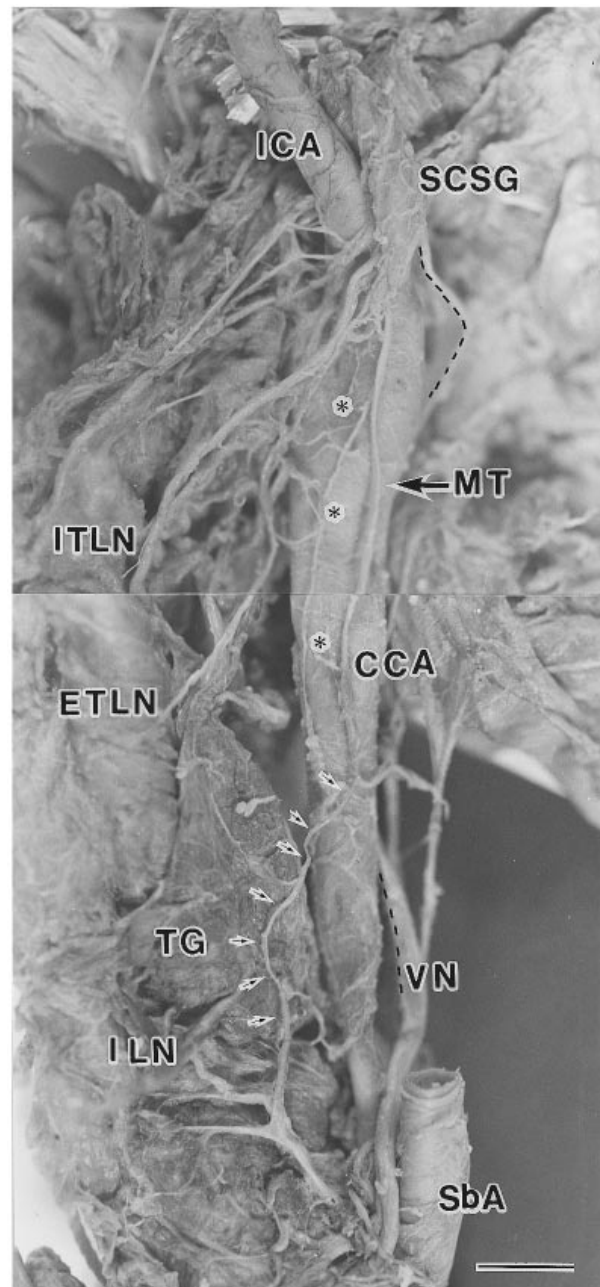


Fig. Morphological relationships the communication (small arrows) between the inferior laryngeal nerve (ILN) and the superior cervical sympathetic ganglion (SCSG). The branches (small asterisks) of the SCSG supplied to the internal (ICA) and the external carotid arteries, the main trunk (MT, large arrow) descended along to the thyroid gland which connected with the ILN. CCA, common carotid artery; ETLN, external laryngeal nerve; ITLN, internal laryngeal nerve; TG, thyroid gland; VN, vagus nerve (interrupted line); SbA, subclavian artery. Bar, 1 cm.

(1931) noted that there were various communications between the vagus nerve, the SCSG and the cervical nerves. Fick (1926) and Hara et al. (1993) reported communicating branches between the inferior vagal ganglion and the SCSG. Twigs from the recurrent laryngeal nerve connect with the inferior cervical sympathetic ganglion (Schäfer & Symington, 1909). The middle cervical and stellate ganglia in the inferior region of the neck connect with small ganglia in the recurrent laryngeal nerve (Hoffman, 1957) and branches from the 1st, 2nd and 3rd cervical nerves communicate with the SCSG. In the unusual case reported here, a communication between the ILN and SCSG was found behind the thyroid gland on the right side.

There are many reports of the risk of nerve damage during surgical treatment for thyroid carcinoma (Sugenoya et al. 1993) and during cervical lymphadenectomy (Jones et al. 1994), particularly for the innervation of the larynx.

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