INJURY TO TERMINAL BRANCHES OF THE TRIGEMINAL NERVE FOLLOWING TRACHEAL INTUBATION

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Although tracheal intubation is one of the commonest manipulations undertaken by the anaesthetist, complications are few in number and are generally limited to sore throat, and minor contusions or lacerations of the oropharynx. An unusual case of injury to a number of the terminal branches of the 5th cranial nerve is reported.

CASE REPORT

In a 33-year-old patient about to undergo Caesarean section for delivery of her second child, preoperative examination revealed no abnormalities of note, and biochemical and haematological investigations were within their normal ranges. Although somewhat obese, the patient did not appear to have any anatomical abnormalities that would suggest that intubation of the trachea might be difficult.

No premedication was administered and anaesthesia was induced with thiopentone 200 mg i.v. Suxamethonium 50 mg was given. On laryngoscopy no laryngeal structures were visible and considerable effort was required to visualize the tip of the epiglottis. Intubation of the trachea, and attempts to bring the laryngeal opening into a suitable position by cricoid manipulation, were unsuccessful. Following atropine 0.5 mg, the patient received suxamethonium 25 mg repeatedly to maintain muscular paralysis and the lungs were ventilated with 67% nitrous oxide in oxygen. Further attempts to pass the tracheal tube (Portex 8 mm) using a variety of guide wires were unsuccessful and it was decided to proceed using a retrograde approach (Faithfull, 1982). An extradural needle was passed percutaneously through the cricothyroid membrane into the trachea and an extradural catheter placed in the pharynx. Once this catheter had been attached to a suction catheter, the latter was drawn down between the vocal cords by traction on the part of the extradural catheter extending from the skin in the neck. Initially, attempts at intubation by passing an 8-mm armoured latex tube over the suction catheter were unsuccessful. However, eventually, successful placement of the tracheal tube was achieved through the left nostril—using the same retrograde technique. At the end of the operation the tube was removed after the patient had recovered full consciousness.

Two hours after surgery, the patient complained of numbness of the tip of her tongue and of the mucosa of the left lower and upper lips. The numbness was confined to the medial half of the lips and on no occasion was there confluence of sensory loss around the corner of the mouth. It was thought that these effects were caused by the lignocaine spray that had been used before intubation. However, the symptoms were still present next day, and on examination, there was a decrease in sensation to pinprick over the areas indicated in figure 1. The primary area of sensory loss was centred on the tip of the tongue over a radius of about 1 cm. In addition, further loss of sensation was found in an area of skin of the upper lip which extended from the mid-line along the mucocutaneous junction, for a length of about 1.5 cm. This area extended either side of the mucocutaneous junction for about 0.5 cm. A similar

SUMMARY

Injury to multiple terminal branches of the maxillary and mandibular divisions of the trigeminal nerve is described. The injury occurred following difficult tracheal intubation using a retrograde technique. The possible anatomical basis of the injury is described.
but slightly larger area of loss of sensation to pin-prick was found on the left lower lip. There was no loss of taste sensation and secretomotor activity was not obviously impaired. By the 3rd day after operation the sensory loss on the lips had recovered. Normal sensation to the tip of the tongue returned slowly over the next 3 weeks.

FIG. 1. Areas of diminished sensation to pinprick on the day following operation. Taste sensation was unaffected.

DISCUSSION

Injury to the lingual nerve following orotracheal intubation is rare and a search of the literature revealed only three reports in the past 20 yr. On two occasions, right-sided injury was reported (Teichner, 1971; Loughman, 1983) and in one, left-sided injury was described (Jones, 1971). On all occasions difficulty in intubating the trachea was mentioned and, on two occasions, specific mention was made of cricoid pressure being applied. As far as can be ascertained, the present paper is the only one to report bilateral damage to the lingual nerve.

The lingual nerve arises from the posterior division of the mandibular nerve and then passes between the tensor veli palatini and the lateral pterygoid muscles where it is joined by the chorda tympani branch of the facial nerve. This carries preganglionic parasympathetic (secretomotor) fibres supplying (via the mandibular ganglion) the submandibular and sub-lingual salivary glands. The majority of the fibres in the chorda tympani are afferent, carrying taste sensation from the anterior two-thirds of the tongue. Thus, damage to the lingual nerve during intubation may cause loss of taste sensation, as reported by Teichner (1971) and Jones (1971). To date, no instances of sudomotor impairment have been reported.

The lingual nerve passes anterior to the inferior dental nerve, the other main division of the mandibular nerve, and after emerging from the lower border of the lateral pterygoid it lies in contact with the inner surface of the mandible and is covered medially by the medial pterygoid muscle. After emerging from the anterior border of this structure it lies sub-mucosally just inferior to the 3rd molar tooth. The nerve may be injured, particularly on the right side, by direct trauma from the laryngoscope blade either in this position or as it lies on the mylohyoid muscle in the floor of the mouth (Teichner, 1971). Schwartz (1973) has reported that injury of the lingual nerve often accompanies extraction of the 3rd molar tooth and has suggested that in some cases, tongue retraction during operation may cause stretching and injury.

During the terminal part of its course the lingual nerve lies on the lateral border of the hyoglossus muscle. It then passes round the submandibular duct and divides into its terminal sensory branches. During tracheal intubation considerable force may be applied to the base of the tongue (Scheck, 1982). This results in traction, via the hyoglossus, the hyoid bone and the thyrohyoid membrane on the thyroid and cricoid cartilages. If the cricoid is restrained by cricoid pressure or manipulation, the lingual nerve may be stretched and damage may occur.

The inferior dental nerve, the other main branch of the mandibular division of the trigeminal nerve, enters the mandibular canal by passing lateral to the sphenomandibular ligament. It supplies branches to the teeth and gums and emerges from the mental foramen as the mental nerve. The latter supplies sensation to the skin of the chin, and the skin and mucous membrane of the lower lip. During difficult intubation, force may be transmitted to the mandible, causing partial forward subluxation of the temporomandibular joints and there may be traction on the mandibular nerve as it emerges from the foramen ovale at the base of the skull. This mechanism could account for the decrease in sensation over the lower lip and for the loss of sensation over the tip of the tongue seen in this patient. The fact that taste sensation was intact would also indicate that damage had occurred proximal to the point at which the chorda tympani joins the lingual nerve.
Loss of the sensation of the left upper lip is difficult to explain as this is supplied by the maxillary division of the trigeminal nerve (inferior orbital nerve). It is possible that the presence of a tracheal tube in the nasal cavity could cause compression of nasal branches of the long sphenopalatine and the great palatine nerves which supply sensory branches to the walls and floor of the nasal cavity. It could be postulated that aberrant labial branches might occur from either of these nerves and hence sensory loss would occur over the upper lip.

In conclusion, temporary injury to a number of terminal branches of the trigeminal nerve is described. Most, but not all, of the damage is explicable on anatomical grounds.

REFERENCES


