

7.1 Practical Tips to Identify the Main Trunk of the Facial Nerve

Fernando L. Dias^{a, b}, Roberto A. Lima^{a, b}, Jorge Pinho^c

^aHead and Neck Surgery Department, Brazilian National Cancer Institute and

^bPost-Graduation School of Medicine, Catholic University of Rio de Janeiro, Rio de Janeiro, and

^cMemorial San Jose Hospital of Recife, Recife, Brazil

PEARLS

- Identification of the anatomic landmarks is paramount.
- The pointer of the tragal cartilage indicates the position of CN VII trunk.
- In reoperations or when the identification is obscured (by the tumor), try the retrograde approach.

PITFALLS

- Avoid going directly to the CN VII trunk area before identifying the anatomic landmarks.
- The styloid process is not a good landmark to retrieve the CN VII.

Introduction

The facial nerve (CN VII) exits the skull base through the stylomastoid foramen, located slightly posterolateral to the styloid process and anteromedial to the mastoid process. The main trunk of the CN VII passes through the parotid gland and, at the pes anserinus (Latin: goose's foot), divides into the temporofacial and cervicofacial divisions approximately 1.3 cm from the stylomastoid foramen [1].

Although there are several ways to develop surgical access to the CN VII (and the surgeon must be familiar with all of them), the most pop-

ular is the antegrade approach with the identification of the main trunk first [2]. Facial nerve paresis or paralysis can occur as an early complication following surgical procedures involving the parotid gland and the CN VII. Temporary paralysis occurs in 10–30% of superficial parotidectomies, while permanent CN VII paralysis occurs in less than 1% [3].

Practical Tips

It is important to keep in mind that the anatomic landmarks in the operative identification of the CN VII (posterior belly of the digastric muscle, mastoid process, tympanic bone and external auditory canal cartilage) should always be exposed prior to any attempt at identifying the nerve, and that the parotid parenchyma should not be incised without first locating and following the CN VII.

- 1 Superficial or total parotidectomy is performed under general anesthesia. Long-term paralytic agents should be avoided to allow for CN VII monitoring when indicated [2–5].
- 2 The nerve lies approximately 1.0–1.5 cm deep and slightly anterior and inferior to the tip of the external canal cartilage (also called 'pointer') [2–5].
- 3 The nerve lies approximately 1.0 cm deep to the medial attachment of the posterior belly of the digastric muscle to the digastric groove of the mastoid bone [2–5].

④ The tympanomastoid fissure, located between the mastoid and the tympanic bones, begins just distal to the suprameatal spine. The CN VII lies 6–8 mm distal to the end point of this fissure [2–5].

⑤ The CN VII usually courses superficial to the facial vein and division of this structure (as well as the division of the external jugular vein) can contribute to increasing venous bleeding during dissection of the gland [3].

⑥ The stylomandibular artery, which lies just superficial to the nerve as it enters the gland, may provoke troublesome bleeding if not ligated and divided [2].

⑦ If the proximal segment of the CN VII is obscured, retrograde dissection of one or more of the peripheral CN VII branches may be necessary to identify the main trunk [2, 3, 5].

⑧ When necessary, the CN VII can be identified in the mastoid bone by mastoidectomy and followed peripherally. This approach is usually reserved for unusual recurrences, intratympanic or large tumors [2, 3].

⑨ The use of wide-angled surgical loupes with 2.5–3.5× magnifying lenses and facial nerve monitoring may facilitate the identification of the nerve, particularly in reoperations or in situations where the anatomy is not clear [2–5].

⑩ Although recommended by some, the styloid process should not be used as a landmark for finding the trunk of the CN VII since this increases the risk of damaging the nerve [4].

Conclusion

Operative identification of the main trunk of the CN VII is a step-by-step procedure in which previous identification of the anatomic landmarks described above is highly advisable. The opening of the preauricular space allows the exposure of the tragal cartilage pointer which is the last and most important landmark for the identification of the main trunk of the CN VII.

References

- 1 Holsinger FC, Bui DT: Anatomy, function, and evaluation of the salivary glands; in Myers EN, Ferris RL (eds): *Salivary Gland Disorders*. Berlin, Springer, 2007, pp 1–16.
- 2 Granick MS, Hanna DC 3rd: Surgical management of salivary gland disease; in Grannick MS, Hanna DC 3rd (eds): *Management of Salivary Gland Lesions*. Baltimore, Williams & Wilkins, 1992, pp 145–174.
- 3 Wang SJ, Eisele DW: Superficial parotidectomy; in Myers EN, Ferris RL (eds): *Salivary Gland Disorders*. Berlin, Springer, 2007, pp 247–246.
- 4 Mihelke A: Surgery of the salivary glands and the extratemporal portion of the facial nerve; in Nauman HH (ed): *Head and Neck Surgery: Indications, Techniques, and Pitfalls*. Philadelphia, Saunders, 1980, pp 421–465.
- 5 Shah JP, Patel SG: Salivary glands; in Shah JP, Patel SG (eds): *Head and Neck Surgery and Oncology*, ed 3. Edinburgh, Mosby, 2003, pp 439–474.