border of the sternocleidomastoid muscle and inferior belly of the omohyoid muscle (Fig. 10.9B). The TCA is usually encountered first in the fibrofatty tissues cephalad to the omohyoid muscle. The TCA is usually deeper and more superior to the vein.[17] Anatomic dissections showed the TCA to arise from the thyrocervical trunk in 77% of the time or directly from the subclavian artery in 20% of the time. The TCA and TCV were reportedly clinically absent in 6% and 12% of explored necks, respectively.[17,18]

SUPRATROCHLEAR ARTERY

Arising from the ophthalmic branch of the internal carotid system, the supratrochlear artery supplies the paramedian forehead flap. This is probably the oldest flap in history and still has a place today. The artery runs over the medial one-third of the supraorbital rim to supply the midline forehead up to the vertex. In raising the forehead flap, it is important to remember that this vascular pedicle can be dissected around the orbital rim, and extending it around the medial brow increases the arc of rotation of the flap. This is particularly important when reconstructing the nasal tip and columella. Subperiosteal dissection at this level ensures that the artery is not injured.

VENOUS ANATOMY OF THE HEAD AND NECK

While the venae comitantes of arteries are frequently appropriate for venous drainage of free flaps, there are some particular features about the head and neck region that are noteworthy (Figs 10.4B, 10.5).

FACIAL VENOUS SYSTEM

The anterior facial vein is located posterior/lateral to the facial artery and, while the artery is somewhat tortuous, the vein is relatively straight. It is generally of excellent caliber and is very useful as a recipient for a free tissue transfer. However, the anterior facial vein is often divided in patients who have had a neck dissection and, therefore, is not always available. The facial vein begins at the nasal ala as a continuation of the angular vein. The vein courses under the zygomaticus and levator labii superioris, and descends along the anterior border of the masseter and over it, receiving the deep facial vein, with tributaries from the pterygoid venous plexus along with the superior and inferior labial veins, buccinator and masseter venous branches. The vein then crosses the mandibular border deep to the platysma muscle and joins the retromandibular vein to form the common facial vein. The facial vein diameter is 2.2–3.2 mm. The common facial vein is larger measuring 2.4–3.5 mm in diameter.[19]

ADVANTAGES AND DISADVANTAGES

The advantage of the anterior facial vein is that it has good caliber. Also, it runs separate from the facial artery and therefore is less likely to be damaged during dissection of the artery. The main disadvantage is that it may not be available if the patient has had a neck dissection. While the distal end may still be intact, venous drainage is less reliable and, therefore, our practice is not to use it in these cases.

VEINS IN THE HEAD AND NECK

There are numerous veins in the neck (Figs 10.4b, 10.5) that may be used as recipient veins but the choice of which vein to use will depend on individual circumstances. In patients who have had a neck dissection, the choice of available veins may be limited. An end-to-side anastomosis to the internal jugular vein is jugular vein is a good option when other vessels are not available for an end-to-end anastomosis. The external jugular vein can be very useful if it can be preserved, and the transverse cervical vein is invariably intact. The anterior jugular vein is also sometimes an option. If there are no veins available in the local region, the cephalic vein can be dissected and tunneled into the neck, where it will reach the angle of the mandible.[20]

ADVANTAGES AND DISADVANTAGES

The main advantage of using a vein located in the neck is the abundance of available veins and the caliber of most of them. The main disadvantage is the extra pedicle length needed to reach from the neck to a defect located in the head. This, however, is rarely a major problem. One particular caution if choosing the anterior jugular vein, is that if the patient has had a tracheostomy, this vein may have been divided. It is important to be aware of this possibility and to double check that it is patent.

NERVES IN THE HEAD AND NECK

Understanding the anatomy of the Trigeminal (Fig. 10.10) and facial nerve (Figs 10.11 and 10.12) are crucial to the success of any operation in this region. The issue of whether or not to innervate free flaps in the head and neck continues to be controversial. While it is true that sensation can be restored and it appears intuitive that an innervated flap is better, it remains to be shown whether reinnervation improves function.[21] The nerves most commonly used in head and neck reconstruction are the lingual nerve (to provide sensory reinnervation for intraoral reconstruction) and the facial and masseter nerves (to provide motor reinnervation for facial reanimation).[22] It is imperative to understand the anatomy and position of the facial nerve. To restore facial motion, the facial nerve from the intact contralateral side may be used for a cross-facial nerve graft in a two-stage procedure or the motor nerve to masseter muscle may be used to restore facial movement in a one-stage reconstruction. Both the hypoglossal nerve and the accessory nerve have also been used for facial reanimation, the former in the form of a nerve transfer (XII/VII Transfer) while the accessory nerve can be split and used to animate a functioning muscle transfer such as the gracilis. The other important nerve that one needs to know about is the great auricular nerve. This is the nerve most frequently damaged during a facelift. The great auricular nerve originates from the cervical plexus, composed of branches of spinal nerves C2 and C3. It provides sensory innervation for the skin over the parotid gland and mastoid process, and both surfaces of the outer ear. It arises from the second and third cervical nerves, winds around the posterior border of the sternomastoid muscle, and, after perforating the deep fascia, ascends

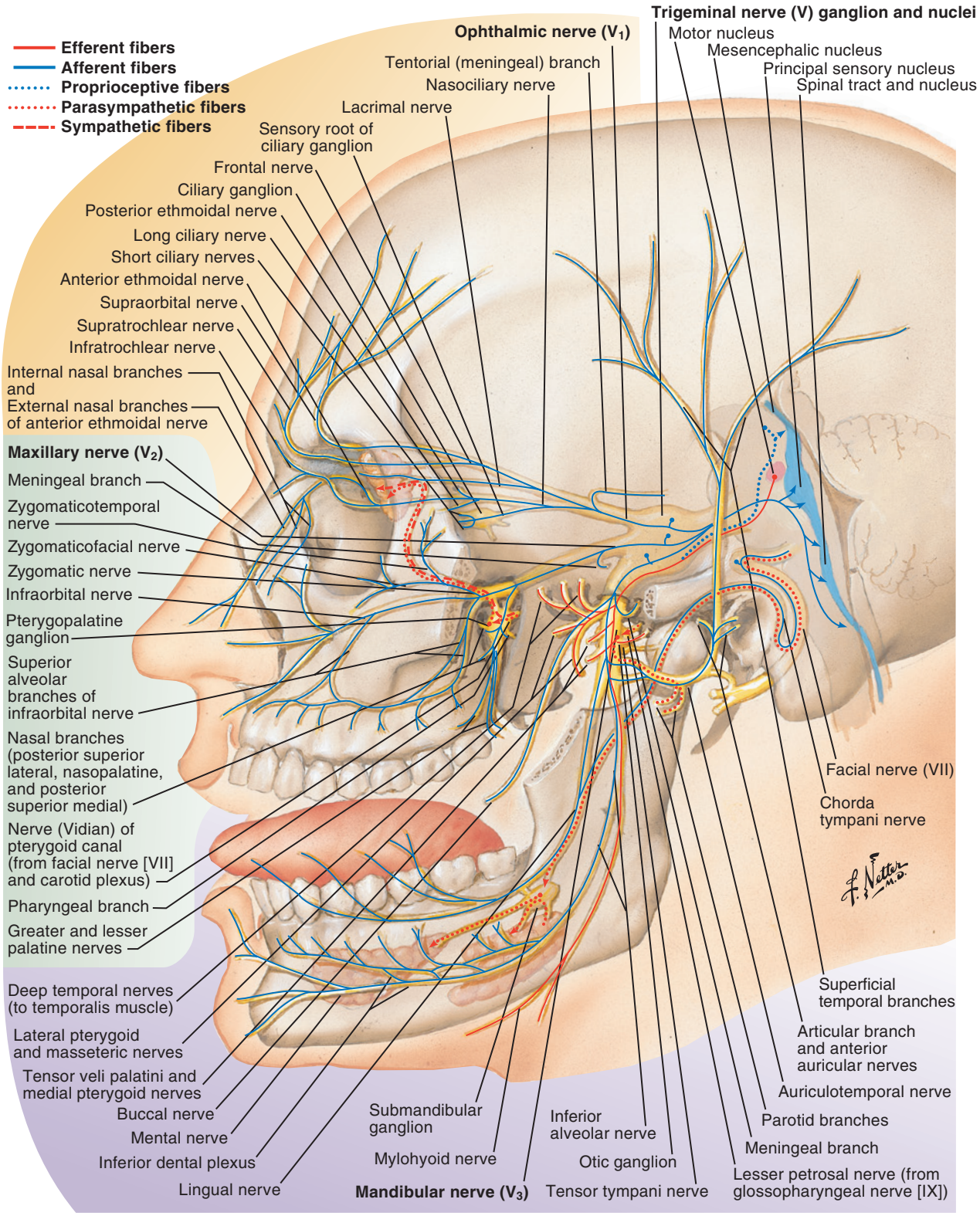

Figure 10.10 The trigeminal nerve. (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)