Cosmetic

Incidence of Cervical Branch Injury with “Marginal Mandibular Nerve Pseudo-Paralysis” in Patients Undergoing Face Lift

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The anatomy of the cervical and marginal mandibular branches of the facial nerve is reviewed. In the senior author’s practice, “pseudoparalysis of the marginal mandibular nerve” due to cervical branch injury occurred in 34 of 2002 superficial musculoaponeurotic system–platysma face lifts (1.7 percent) and was associated with a full recovery in 100 percent of cases within a time period ranging from 3 weeks to 6 months. Cervical branch injury can be distinguished from marginal mandibular nerve injury by the fact that the patient will be able to evert the lower lip because of a functioning mentalis muscle. (Plast. Reconstr. Surg. 111: 2414, 2003.)

Concern exists regarding the potential for injury to a branch of the facial nerve during a face lift. Because of variable and overlapping nerve supply to the perioral musculature as well as the overlapping functions of several muscles (particularly the lip depressors), it can be difficult clinically to distinguish the exact cause of postsurgical lip dysfunction. With the classic subcutaneous facial dissection and superficial musculoaponeurotic system (SMAS) techniques, the frontal and marginal mandibular branches of the facial nerve are injured most often.¹

For most patients, loss of platysma motor function due to cervical nerve injury in SMAS–platysma elevation is of relatively little consequence. However, in the 2 percent of patients noted by Rubin² to exhibit a “full denture smile,” the platysma co-functions with depressor anguli oris to contribute significantly as a lip depressor. Injury to the cervical branch in these patients results in loss of depressor function to the affected corner of the mouth. Transient lip depressor dysfunction had been a common observation in patients undergoing neck dissection with platysma excision.³ In 1979, Ellenbogen⁴ described two cases of transient “pseudoparalysis of the marginal mandibular nerve” due to cervical branch injury; they were distinguished from marginal mandibular nerve injury by the fact that these patients could still evert the lower lip because of a functioning mentalis muscle.

ANATOMY OF THE MARGINAL MANDIBULAR AND CERVICAL BRANCHES

The marginal mandibular nerve exits the anterior-inferior portion of the parotid near the angle of the mandible and remains deep to the investing cervical fascia. It courses forward deep to the anterior facial vein in contact with the superolateral surface of the submandibular gland as it curves down as much as 3 cm below the inferior border of the mandible.¹,⁵ Near the mandibular mid-body, the marginal mandibular nerve swings upward and perforates the deep cervical fascia near the mandibular border to continue within the fibroareolar tissue between the deep fascia and platysma. The nerve crosses the anterior facial artery to innervate the deep surface of the depressor quadratus labii inferioris and mentalis muscles. It may anastomose with cervical and buccal branches that supply the depressor anguli oris and the cephalic portion of the platysma.
The vulnerable point for injury of the marginal mandibular nerve is after it exits the deep cervical fascia and courses up over the anterior mandible in the region of the facial artery. Nerve injury can occur during dissection in the superficial subcutaneous layer if the platysma is penetrated in the region of the anterior jowl with scissors or even with a liposuction cannula. Superficial dissection over the mid-anterior mandible should be performed with great care and preferably under direct vision. Injury can also occur during dissection beneath the platysma from below with scissors. The “danger zone” for the marginal mandibular nerve extends from the angle of the mandible to its crossing by the anterior facial artery and reaches from the inferior border of the mandible to a parallel line 3 cm below (Fig. 1). Beyond the danger zone, scissors can be passed from the lateral neck to the submental area and spread without risk of injury to the marginal mandibular nerve.

The cervical branch of the facial nerve exits the inferior margin of the parotid gland slightly anterior to the angle of the mandible; then it immediately perforates the deep investing fascia and continues upward in the fibroareolar connective tissue that attaches to the platysma near its superolateral border. The platysma can be dissected from the deep fascia in this area with a combination of scissors spreading and blunt “peeling” of areolar tissue from the undersurface of the muscle with a peanut sponge. As the region of the branch (or branches) of the cervical nerve is approached, the areolar connection becomes more dense and firm, usually preventing blunt dissection from damaging the nerves (Fig. 2).

When the senior author first began performing subplatysma–SMAS dissections in the 1970s, care was taken to limit any dissection in the lateral danger zone, and there were no cases of disturbances in mouth movement following surgery. In an effort to improve the mobility of the SMAS–platysma skin flap in an upward rotary fashion, more dissection was undertaken in the lateral danger zone area; consequently, temporary depressor muscle dysfunction occurred on a number of occasions. The incidence of temporary depressor muscle dysfunction due to platysma paralysis was in the 3 percent range. Muscle dysfunction typically resolved within 6 weeks, but on rare occasions it lasted for 5 to 6 months. In the majority of cases, the patient’s left side was affected, perhaps because after right-sided facial closure, dissection in the area of the left mandibular
angle and superior lateral neck where the cervical branch is at risk is more awkward for the right-handed surgeon. Starting in the mid-1980s, the senior author made a concerted effort to protect the cervical branch; the current incidence of transient lip depressor dysfunction is approximately 1 percent.

CASE REPORTS

In 2002 cases of SMAS–platysma face lift performed between 1977 and 2001, there were 34 cases of cervical branch injury (1.7 percent), all of which resolved (case 1, below). Only one patient with diminished depressor function of the lip had an associated mentalis weakness suggesting a marginal mandibular branch injury; the patient’s lip returned to normal in 2 months. Only one patient has persistent residual disability in mouth movements (case 2, below). There were no instances of injury to the frontal, zygomatic, or buccal branches of the facial nerve.

Case 1

A 47-year-old woman was seen 10 days after her SMAS–platysma face lift and coronal brow lift. Her “full denture-type smile” was asymmetrical on the left side (Fig. 3, left). Mandibular branch function was demonstrated by intact mentalis protrusion of the lower lip in a symmetrical fashion (Fig. 3, center). She adopted a “zygomaticus-type smile” during convalescence to disguise the disability (Fig. 3, right). After another month, the patient had recovered her normal smile (Fig. 4).

Fig. 3. Case 1. A 47-year-old patient with cervical branch injury: (left) asymmetrical, “full denture-type smile”; (center) intact, symmetrical mentalis protrusion of the lower lip; (right) a “zygomaticus-type smile” disguises the disability.

Fig. 4. Case 1. The patient had recovered her normal smile.

Case 2

A 54-year-old woman was seen 2 years after her SMAS–platysma face lift. She exhibited symmetrical eversion of the lower lip with intact mentalis function (Fig. 5, left). She had left platysma function cephalic to the location of
platysma transection with a visible platysma depressor effect of the lateral oral commissure. The functioning mentalis and platysma muscles suggested that both the mandibular and cervical branches were intact (Fig. 5, center). However, when the patient attempted to smile, there was evident weakness of the depressor labii quadratus (Fig. 5, right). The exact location of the nerve lesion was not clear, but it was believed to be the peripheral branch of the marginal mandibular nerve to the depressor labii quadratus with a distal intact branch to the mentalis. Most likely, the injury occurred in the lower anterior buccal space near the anterior facial artery, above the mandibular border.

CONCLUSIONS

Because any motor function disturbance is very distressing to both the patient and the surgeon, the senior author avoids aggressive sharp dissection in the lateral danger zone near the angle of the mandible in an effort to prevent cervical branch injury. It is quite possible to limit subplatysmal dissection to “stretching” of the fibroareolar stalk containing the cervical motor nerve branches and still obtain a satisfactory upward rotation of the SMAS–platysma flap. Since refinement of this technique as described in the mid-1980s, it has been safe and reliable, with an incidence of transient labial depressor dysfunction of 1 percent and no marginal mandibular nerve injuries. There has been no compromise of the effectiveness of the lift achieved with the SMAS–platysma rotation flap.

After a face lift, if lip depressor dysfunction is noticed that was not present on preoperative photographs, pseudoparalysis of the marginal mandibular nerve due to cervical branch injury can be distinguished from true marginal mandibular nerve injury by the fact that the patient will still exhibit lip eversion with a functioning mentalis muscle. Cervical branch injury is associated with an excellent prognosis, with complete recovery within 3 to 4 weeks on average.

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REFERENCES


