

PROCEDURAL

C O L U M N

Column Editor: Jennifer Wilbeck, DNP, RN, FNP-BC, ACNP-BC, ENP-C, FAANP, FAAN



Lip Laceration and Vermilion Border Repair

Theresa M. Campo, DNP, APRN, FAANP, FAAN

ABSTRACT

Lacerations to the face and lips are commonly seen in the emergency setting from dog bites, falls, and blunt trauma (motor vehicle crash, strike with an object, etc.). Lip lacerations, especially involving the vermilion border, can be most challenging and deforming, especially when greater than 25% of the lip is involved. These lacerations require preciseness for a good cosmetic outcome. Lips are a highly visible facial structure and consist of 3 layers: skin, muscle, and oral mucosa. They are used for speech, food consumption, and tactile sensation (Lammers & Scrimshaw, 2019; Lent, 2020).

Key words: facial injury, facial nerve block, lip laceration, vermilion border

LACERATIONS to the face and lips are commonly seen in the emergency setting from dog bites, falls, and blunt trauma (motor vehicle crash, strike with an object, etc.). Lip lacerations, especially involving the vermilion border, can be most challenging and deforming, especially when greater than 25% of the lip is involved. These lacerations require preciseness for a good cosmetic outcome. Lips are a highly visible facial structure and consist of three layers: skin, muscle, and oral mucosa. They are used for

speech, food consumption, and tactile sensation (Lammers & Scrimshaw, 2019; Lent, 2020).

The vertical grooves are directly adjacent to and above the upper lip, and below the nose is the philtrum. The commissures are the lateral borders of the oral cavity and where the upper and lower lips join. The white roll forming the border between the skin and the lips is the vermilion border (see Figure 1) (Jahan-Parwar, 2013).

The blood supply to the lips stems from the external carotid system and branches into the facial artery, the submental artery, and then the labial artery. The nerves that supply the lips are the infraorbital and mental nerves. The infraorbital nerve innervates from the lower eyelid to the upper lip. The mental nerve innervates the lower lip, gums, and skin between the lower lip and the chin (Jahan-Parwar, 2013).

Author Affiliation: American Association of Nurse Practitioners, Austin, Texas.

Disclosure: The author reports no conflicts of interest.

Corresponding Author: Theresa M. Campo, DNP, APRN, FAANP, FAAN, American Association of Nurse Practitioners, 5901 Vega Ave, Ste 200, Austin, TX 78735 (tersa16@comcast.net).

DOI: 10.1097/TME.0000000000000356

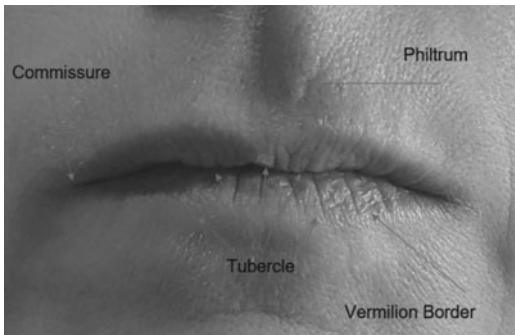


Figure 1. Anatomy of the lips. From AAENP. Used with permission.

FACIAL NERVE BLOCKS

A discussion on how to repair lacerations involving the vermilion border must include two facial nerve blocks. The mental and infraorbital nerve blocks are necessary to anesthetize the area without further distortion of tissue. The infraorbital nerve block provides anesthesia from the inner corner of the eye down through the top lip with distribution to the outer aspect of the eye down to the mandible. The submental nerve block goes from the center of lip down to the chin and across the face and mandible (see Figure 2).

Indications for facial nerve blocks include anesthesia for debridement and closure, pain relief, and when moderate sedation or general anesthesia is contraindicated. Allergy to anesthetic agents, infection at the injection site, distortion of anatomical landmarks, and a noncooperative patient are all contraindications for facial nerve blocks. Potential complications include bleeding, hematoma formation, infection, nerve damage, and reaction to the anesthetic agent.

The nerve block can be performed utilizing either an intraoral approach or an extraoral approach. When using the intraoral approach, preanesthetize the mucosa with a topical anesthetic prior to infiltration. To perform the nerve block, you will need the following:

- Personal protective equipment (PPE)
- Skin cleanser (extraoral)
- Cotton-tipped applicators (intraoral)

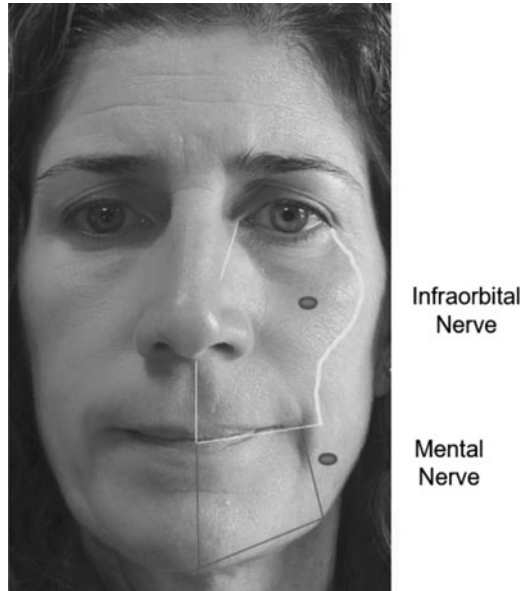


Figure 2. Infraorbital and mental nerve innervation. From AAENP. Used with permission.

- Topical anesthetic (intraoral)
- Lidocaine (Xylocaine) 1% with or without epinephrine or bupivacaine (Marcaine) 0.5% with or without epinephrine
- A 10-ml syringe
- A 25- or 27-gauge needle
- An 18- or 20-gauge needle to aspirate the medication from the vial
 - Nonabsorbable suture material 6-0 nylon
 - Absorbable suture material 4-0 or 5-0 (plain or chromic gut)

After obtaining consent, settle the patient in a supine position, if possible, with the bed at a comfortable height for the provider and optimal lighting for optimal visualization.

INFRAORBITAL NERVE BLOCK

Intraoral Technique

- Soak cotton-tipped applicators with topical anesthetic and place on mucosa opposite the second upper bicuspid (premolar).
- Have the patient look straight ahead and draw an imaginary line, drawn vertically from the pupil downward toward the inferior border of the infraorbital ridge. Follow this line with your finger until you can feel



Figure 3. Infraorbital ridge. From “Complex Lip Laceration,” by G. S. Lent, 2020, *Medscape Drugs & Diseases*. Retrieved from <https://emedicine.medscape.com/article/83256-overview#showall>. Reproduced with permission.

the “notch” of the infraorbital ridge (see Figure 3).

- Keep the palpating finger in place and retract the cheek.
- Insert the needle into the mucosa opposite the second bicuspid (premolar), staying parallel with the second bicuspid and directing the tip toward the palpating finger, which will be near the foramen (see Figure 4).
 - 1.5–2.5 cm
 - Do not extend too far posteriorly or superiorly as you may enter the orbit.
- Aspirate to ensure you are not in a vessel.
- Instill approximately 2 ml of anesthetic adjacent to the foramen.
 - Do NOT inject into the foramen, which may cause swelling of the lower eyelid.
 - Do NOT inject the nerve itself as it can cause permanent damage.

Extraoral Technique

When performing the extraoral approach, vasoconstrictors should NOT be used because of the close proximity to the facial artery.

- Prep the skin with skin cleanser.
- Have the patient look straight ahead and draw an imaginary line, drawn vertically



Figure 4. Insertion site for technique. From “Complex Lip Laceration,” by G. S. Lent, 2020, *Medscape Drugs & Diseases*. Retrieved from <https://emedicine.medscape.com/article/83256-overview#showall>. Reproduced with permission.

from the pupil downward toward the inferior border of the infraorbital ridge. Follow this line with your finger until you can feel the “notch” of the infraorbital ridge (see Figure 3).

- Insert the needle passing the skin, subcutaneous tissue, and quadratus labii superioris muscle directing to the palpating finger at the inferior ridge and aspirate to ensure you are not in either the facial artery or vein.
- Instill approximately 2 ml of anesthetic adjacent to the foramen.
 - Do NOT inject into the foramen, which may cause swelling of the lower eyelid.
 - Do NOT inject the nerve itself as it can cause permanent damage.
- Withdraw the needle and firmly massage the area.

MENTAL NERVE BLOCK

The intraoral technique is discussed in this article as it is less painful to the patient and more widely used.

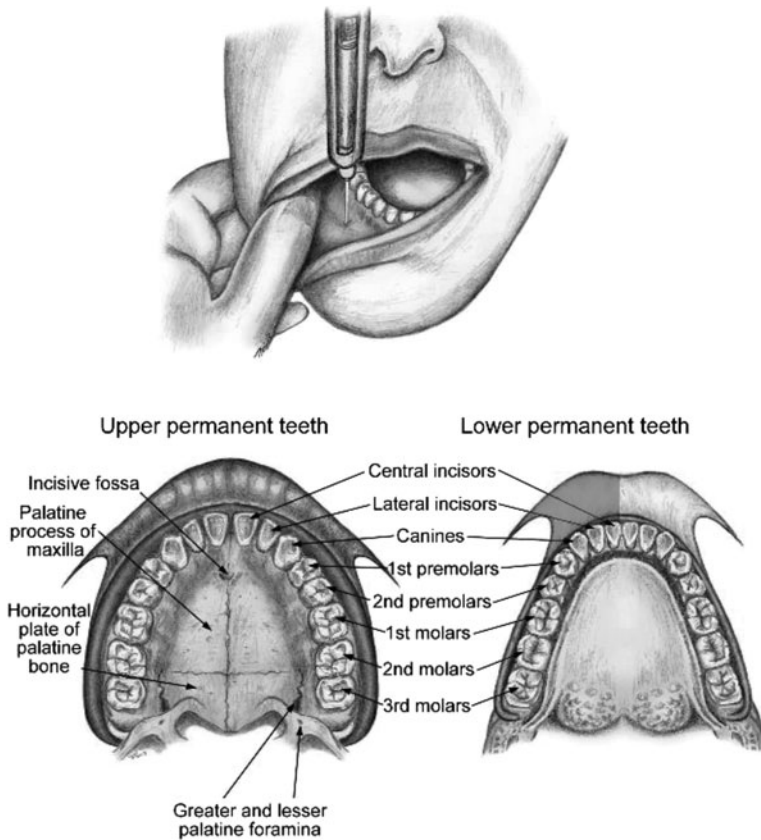


Figure 5. Landmark and insertion of needle. From “Oral Nerve Block,” by M. W. Van De Meer, 2019, *Medscape Drugs & Diseases*. Retrieved from <https://emedicine.medscape.com/article/82850-overview#showall>. Reproduced with permission.

Intraoral

- Retract the lip and cheek to palpate the mental foramen located at the junction of the mandibular first and second premolars and downward 1 cm inferior to the gum line over the labial fold.
 - Slightly medial to the midline pupil.
- Soak cotton-tipped applicators with topical anesthetic.
- Insert the needle 1 cm inferior to the second premolar at a 45° angle until you touch bone of the mandible and then withdraw slightly (see Figure 5).
- Aspirate to ensure you are not in a vessel and then instill the anesthetic agent (2–3 ml).

- Withdraw the needle and firmly massage the area.

LIP LACERATION REPAIR

Lip lacerations can involve the external lip, vermillion border, or intraoral area. Lacerations involving the vermillion border need to be properly aligned to ensure a cosmetically acceptable result. A closure needs to be meticulous as 1–2 mm of malalignment can be noticeable. Local infiltration is not recommended as it can distort the tissue. Facial nerve blocks are recommended to avoid malalignment.

Lip lacerations can be contaminated with dirt, debris, and multiple organisms from the

mouth. It is imperative to take all measures to irrigate the wounds, and antibiotic prophylaxis should be considered.

VERMILION BORDER LACERATION REPAIR

To repair a vermillion border laceration, you will need the following:

- Personal protective equipment (PPE)
- Anesthetic equipment (see the aforementioned section for performing nerve blocks)
- Saline or tap water for irrigation
- Basin
- Syringe with splash shield or irrigation device
- Suture kit
- Suture material
 - Nonabsorbable suture material 6-0 nylon
 - Absorbable suture material 4-0 or 5-0 (plain or chromic gut)

The patient is already positioned from the nerve block.

- Irrigate the extraoral aspect of the wound(s) with saline or tap water using either a syringe and splash guard or irrigation device. Be sure to have the patient tightly close his or her mouth to avoid choking during irrigation.
- Inspect the wound(s) carefully for foreign bodies (i.e., teeth).
- Assess the teeth for injury.
- For extraoral aspects of lacerations, you can have the patient swish and then spit water to free any debris.
- If the wound is deep, you may need to close the intradermal layer first with absorbable suture material.
- Approximate the vermillion border and place a simple interrupted suture with 6-0 nylon (see Figure 6).
 - You can approximate the vermillion border with your fingers and place a pen mark where your suture should be.

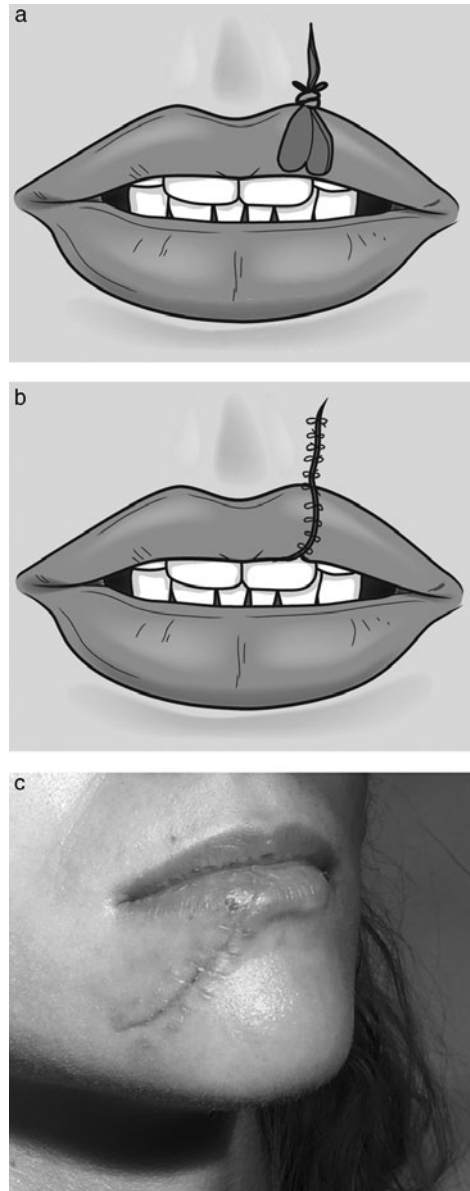


Figure 6. (a) First suture placed at the vermillion border, (b) completed sutures aligning the vermillion border, and (c) suture removal. From "Procedure for Wound Closure," by A. S. Fox and T. M. Campo, 2021, In T. M. Campo & K. A. Lafferty (Eds.), *Essential Procedures for Emergency, Urgent, and Primary Care Settings: A Clinical Companion* (3rd ed., pp. 365-382), New York, NY: Springer. Copyright 2021 by Springer Publishing. Reproduced with permission.

- Using a line as the mark will allow for proper alignment.
- Once the border is aligned, close the remaining laceration with simple interrupted sutures.
- If the wound extends intraorally, use absorbable sutures for that area of the closure.

CONCLUSION

Vermilion border lacerations can be challenging but very rewarding. Key concepts to remember are proper facial nerve anesthesia and patient cooperation to prevent malalignment, irrigation and prophylaxis to prevent infection, and confidence in your ability to perform the closure and give reassurance to the patient. When caring for patients with facial lacerations, regardless of the mechanism, always assess for other injuries including facial fractures and dental injuries. Tetanus immunization status should

always be assessed and covered per current guidelines and recommendations.

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