Lacerations of the Face

A 27 year-old male with no significant past medical history presents to the ED with a facial laceration secondary to trauma. The patient states that two hours prior, he was in a grocery store where had a confrontation with an ex-girlfriend who bit him on the forehead above his right eye. He denies fever, chills, nausea, vomiting, or any prior similar incidences. Patient does not recall his last tetanus shot. Vitals are 128/72, pulse 68 bpm, respiratory rate 12, O₂ saturation 99% on room air. On physical exam, the patient has a 3 cm x 2 cm superficial elliptical laceration on his forehead involving the superior border of his right eyebrow. The borders of the laceration are unable to be approximated without disfiguring the forehead and eyebrow. Which of the following approaches would be the most appropriate next step in treating the forehead laceration?

A. Cleanse, irrigate, and proceed with primary closure; treat with cephalexin (Ancef)

B. Cleanse, irrigate, and proceed with primary closure; treat with amoxicillin-clavulanate (Augmentin)

C. Cleanse, irrigate, and allow for healing by secondary closure; treat with cephalexin (Ancef)

D. Cleanse, irrigate, provide amoxicillin-clavulanate (Augmentin) and consider referring to plastic surgery to close with a skin graft

Facial wounds are the most cosmetically apparent of all wounds and often involve many functional underlying structures. Therefore, careful evaluation and meticulous repair techniques are required for the best possible outcome. Three common principles to guide repair of facial and scalp lacerations include:

1) Cleanse, irrigate, and remove foreign object.
2) Limit debridement of skin edges due to excellent blood supply.
3) If local anesthetic infiltration distorts anatomy and hinders wound edge alignment, use regional nerve blocks.
The correct answer is **D**, Cleanse, irrigate, provide amoxicillin-clavulanate (Augmentin) and consider referring to plastic surgery to close with skin graft. All lacerations should be rinsed cleansed and irrigated with high pressure and high volume of either normal saline or tap water. Because cephalxin (Ancef) has poor activity against Eikenella, a common human oral organism, cephalxin should be avoided. The agent of choice is amoxicillin-clavulanate (Augmentin). Trimethoprim-sulfamethoxazole (TMP-SMX, i.e. Bactrim) is also appropriate, especially if the patient is allergic to penicillin.

Because facial and scalp lacerations have a low incidence of post-repair infection, primary closure can usually be done in wounds that are not obviously infected, regardless of the duration of time since the injury or even if the injury was from a bite. In this case, the inability to approximate the wound edges without causing disfigurement indicates that it may require a surgery referral for laceration repair.

**Epidemiology and Etiology**
Approximately 3 million people present annually to the ED for treatment of traumatic facial injuries in the United States, the majority being for minor soft tissue injuries that require first-aid care or primary closures. The primary cause ranges from domestic violence in inner metropolitan areas to sport participation in males 10-29 years old. Of facial lacerations, injuries to the forehead, orbital region (eyelid/eyebrow) and lips comprise over 75% of all soft tissue injuries.

**Anesthesia**
Although children may need sedation for wound repair, anesthesia is primarily provided by topical, local or regional infiltration. Topical agents can provide adequate anesthesia in one-half of patients, reducing the need for local anesthetic injection. Local anesthetics (like lidocaine) with epinephrine can be used in highly vascular wounds to help control hemorrhage from small vessels; however, epinephrine use should be avoided in wounds such as the nasal septum and the tips of noses and ears due to the risk of necrosis. Meanwhile, regional infiltration such as nerve blocks (Figure 2) may be preferred if the laceration covers a large area where injection of a local anesthetic may cause distortion. A good concept of nerve location and areas of distribution is required for nerve blocks.

**Repair of the Forehead**
Forehead lacerations are categorized as either superficial (not involving the frontalis muscle) or deep (involving the frontalis muscle). Superficial lacerations can be closed with 6-0 non-absorbable interrupted suture, rapidly absorbable suture or tissue adhesive. Deep lacerations require closing the muscular layer with a buried 5-0 absorbable suture and epidermal layer closure with 6-0 non-absorbable sutures to avoid noticeable defects (see Figure 3 for recommended suture material and size by site of injury). Adhesives can be used if there is minimal tension, no hair in the area and only an epidermal closure is required.

**Repair of the Orbital Region**
Prior to laceration repair, it is important to examine the structure and function of the eye, followed by involvement of the canthi, lacrimal system or penetration through the tarsal plate or lid margin. Eyelid injuries within 6 to 8 mm of the medial canthus are at risk for canalicul laceration, especially if associated with medial wall blow-out fractures.
Take Home Points

- Facial lacerations are best approached by area of injury, as they are the most cosmetically apparent and require meticulous repair for the best outcome.
- The decision to consult a specialist is dependent on the physician’s experience and comfort level with managing the laceration.

<table>
<thead>
<tr>
<th>Site of Injury</th>
<th>Suture Size</th>
<th>Suture Material (Alternative)</th>
<th>Anesthetic</th>
<th>Typical Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheek, forehead, or nose skin</td>
<td>5-0, 6-0</td>
<td>Nylon/Prolene (chronic for children or patients who cannot return for suture removal)</td>
<td>Cheek: Local or infraorbital nerve block; Nose: Local or Intranasal; Forehead: Local or supraorbital nerve block</td>
<td>3-5 days</td>
</tr>
<tr>
<td>External tongue mucosa</td>
<td>4-0</td>
<td>Chromic (Vicryl)</td>
<td>Local, inferior alveolar, or lingual nerve block</td>
<td>Never</td>
</tr>
<tr>
<td>Eyelid skin</td>
<td>5-0, 6-0</td>
<td>Nylon/Prolene (chronic)</td>
<td>Supra- or infraorbital nerve block</td>
<td>3 days</td>
</tr>
<tr>
<td>Frontalis (forehead) muscle</td>
<td>3-0, 4-0</td>
<td>Polydioxanone (Vicryl, chronic)</td>
<td>Local or supraorbital nerve block</td>
<td>Never</td>
</tr>
<tr>
<td>Galea (Scalp)</td>
<td>3-0, 4-0</td>
<td>Polydioxanone (Vicryl, chronic)</td>
<td>Local</td>
<td>Never</td>
</tr>
<tr>
<td>Lip or intraoral mucosa</td>
<td>4-0</td>
<td>Chromic (Vicryl)</td>
<td>Local, infraorbital, mandibular or mental nerve block</td>
<td>Never</td>
</tr>
<tr>
<td>Lip muscle</td>
<td>4-0</td>
<td>Vicryl/Dexon (chronic, polydioxanone)</td>
<td>Local, infraorbital, submandibular or mental nerve block</td>
<td>Never</td>
</tr>
<tr>
<td>Lip skin</td>
<td>5-0, 6-0</td>
<td>Nylon/Prolene (chronic)</td>
<td>Local, infraorbital or mental nerve block</td>
<td>3-5 days</td>
</tr>
<tr>
<td>Nasal mucosa</td>
<td>5-0</td>
<td>Chromic (Vicryl)</td>
<td>Intranasal</td>
<td>Never</td>
</tr>
<tr>
<td>Scalp skin</td>
<td>3-0, 4-0</td>
<td>Nylon/Prolene (staples, chronic)</td>
<td>Local</td>
<td>14 days</td>
</tr>
<tr>
<td>Subcutaneous tissue</td>
<td>4-0, 5-0</td>
<td>Vicryl (chronic)</td>
<td>Local or regional nerve block</td>
<td>Never</td>
</tr>
<tr>
<td>Tongue muscle</td>
<td>3-0</td>
<td>Vicryl (chronic, polydioxanone)</td>
<td>Local, inferior alveolar, or lingual nerve block</td>
<td>Never</td>
</tr>
</tbody>
</table>

Figure 3. Recommended suture size, suture material, anesthetic and removal time by site of injury.9

Tissue adhesives should not be used near the eye, as adhesives may abrade the cornea or bond the lids together. Lacerations less than 1 mm at the lid edge do not need suturing and will spontaneously heal.

Repair of the Lips

Initial evaluation of lip lacerations requires fully exploring lacerations, teeth and mucosa and identifying any missing, impacted or fractured teeth. While intraoral mucosal lacerations do not need to be sutured if they are isolated and wound edges spontaneously approximate (esp. 1 cm in length), through-and-through lacerations should be closed in layers. If the vermillion border (the junction of skin and red portion of the lip) is involved in any lip laceration, the first stitch should always be to precisely align the vermillion border, as even a 1 mm variation in alignment is noticeable to the naked eye.

When to Consult a Surgical Subspecialty

The choice to consult surgery is ultimately based on the physician’s level of expertise, experience and comfort with managing the laceration. Situations in which one may consider surgical consultation include: wounds to the cheek with associated injury to the facial nerve, facial artery or parotid gland or ducts; lacerations involving the nasal cartilage or ala; eyelid or orbital lacerations that involve the eyelid margin or tarsal plate; complex wounds that require extensive revision or have significant skin loss that may require grafting; and wounds with associated fractures.

REFERENCES