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Lip biting in pediatric dental patients following dental local anesthesia: a case report

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Introduction

Self-inflicted lip trauma is a potential complication of dental treatment involving local anesthesia of the inferior alveolar nerve, particularly among children (Jorgensen & Hayden, 1965). A branch of the mandibular division of the trigeminal nerve, the inferior alveolar nerve is located bilaterally and is responsible for innervating the mandibular teeth and in addition to periodontal tissues, the anterior two-thirds of the tongue, the buccal mucosa, and the lower lip (Malamed, 2000). A prospective study published in 2000 found that 13% of children ages 2 to 18 experienced soft tissue trauma following unilateral or bilateral mandibular nerve block anesthesia (College, Feigal, Wandera, & Strange, 2000). Not surprisingly, the incidence of soft tissue trauma was highest in the youngest age groups – 18% among children less than 4 years of age, 16% in children ages 4 to 7, 13% in 8 to 11 year old children, and 7% in children 12 years of age and older.

Although some dentists use shorter-acting local anesthetics such as plain mepivicaine on children to decrease the duration of post-operative analgesia, the most common local anesthetic used in dentistry is 2% lidocaine with epinephrine 1:100,000 (Malamed, 2000). However, regardless of the type of local anesthetic used, post-operative soft tissue anesthesia can last several hours (Hersh, Hermann, Lamp, Johnson, & MacAfee, 1995; Pinkham, Casamassimo, Fields, McTigue, & Nowak, 2005). Following a dental appointment requiring local anesthesia of the lower teeth (either unilaterally or bilaterally) to treat dental disease (Table 1), a child may bite his or her lower lip out of curiosity associated with the unfamiliar sensation of being

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numb or inadvertently because no pain is felt. Accidental lip biting can also occur during post-operative eating or sleeping. Most dentists instruct caregivers to closely monitor younger dental patients who have received a mandibular nerve block. However, lip biting cannot always be avoided ("Guideline on appropriate use of local anesthesia for pediatric dental patients," 2005; Haas, 1998).

If a child's lip becomes severely ulcerated, a concerned caregiver may contact a primary care physician or nurse practitioner to seek medical advice and treatment. Pediatric nurses are often the first health care professionals in a medical setting to see these children. Thus, nurses are in a unique position to help parents and primary care physicians properly diagnose and treat this benign condition. In most cases, appropriate management of lower lip ulcers resulting from masticatory trauma is limited to palliative care (Malamed, 2000; McDonald, Avery, & Dean, 2004; Scully & Welbury, 2002). Systemic antibiotics and other surgical interventions are unnecessary, as lip biting ulcers are not bacterial infections.

While some pediatric medicine textbooks have described this condition (Kliegman, Behrman, Jenson, & Stanton, 2007; Zitteli & Davis, 2007), there is often no accompanying discussion on how to properly identify and diagnosis lip biting nor is there any clinical guidance on appropriate management. Furthermore, there are no published case reports in the medical literature on lip biting following local anesthesia. We report a case of a child who presented with an ulcerated lower lip secondary to a unilateral inferior alveolar nerve block and was subsequently hospitalized.

Case Report

A 10-year old Caucasian male with no significant contributory medical history was hospitalized after being referred by a local physician for swelling of the lower lip. On the day prior to admission, the patient had visited the dentist and received a right inferior alveolar nerve block and three dental restorations (fillings) in the lower right quadrant of his mouth. Fillings are often necessary to treat dental caries (cavities). After the dental appointment, the patient bit his lower lip, resulting in minor bleeding. The next day, the patient's caregiver noticed a swollen right lower lip along with a white ulcerated lesion. Upon brief examination, the local physician had the patient transferred to a hospital for further evaluation.

At admission, the patient was alert, cooperative, afebrile, and had no reported history of allergies or head trauma. Vital signs and a complete medical history were recorded by a pediatric nurse. He was the examined by a pediatric medical resident and attending pediatrician followed by a pediatric dentistry resident. The lesion was described as a unilateral, single, firm, non-purulent, elevated, irregularly-shaped ulcer located on the lower right lip, 7 mm long and 4 mm wide (Figure 1). There was a similar lesion found on the right buccal mucosa adjacent to the mandibular permanent first molar. Once a diagnosis of multiple traumatic soft tissue ulcers was made, the patient was discharged seven hours after admission.

Discussion

To the unfamiliar clinician, masticatory lip ulceration secondary to mandibular nerve anesthesia can present as a clinically alarming entity. This may explain why some health professionals have reportedly prescribed systemic antibiotics or ordered surgical incision and drainage procedures to treat these ulcers of non-bacterial origin. While lip biting ulcers commonly present with some localized swelling and edema, they are usually not infections and should be treated appropriately.

Table 2 presents a clinical protocol on how to diagnose and manage pediatric patients who present with lip biting secondary to dental local anesthesia. In order to make an accurate

diagnosis, it is important to take a complete dental history. This includes collecting information on recent dental visits and whether mandibular teeth and soft tissue were anesthetized. Management of lower lip trauma is limited to palliative care such as over the counter analgesics. Although it is not typically necessary, the literature also suggests that chlorhexidine gluconate (0.12%) can be used to debride the ulcerated soft tissue (Ferretti, Brown, Raybould, & Lillich, 1990). No medical or surgical intervention is necessary unless the ulcer becomes secondarily infected. The five classic signs of infection include rubor (redness), dolor (pain), calor (fever), tumor (swelling or edema), and loss of function (malaise). The first signs of a traumatic lip ulcer are localized swelling, redness and pain, which are benign and will self-resolve over time. The additional presence of a systemic fever and generalized malaise indicates infection and should be referred for further evaluation.

After a diagnosis of lip biting secondary to dental local anesthesia is made, it is important for the nursing staff to reassure the child's caregiver that the lip ulceration may appear alarming due to the natural process of re-epithelialization. Final healing can take up to several weeks. Nurses can advise the patient's caregiver to contact the child's dentist to ensure that the child receives proper follow up care, which should be provided by the treating dentist. In terms of preventing future soft tissue ulcers, the nurse is in an ideal position to educate the caregiver on the importance of monitoring the child for at least several hours after dental appointments involving dental local anesthesia. To ensure proper information sharing among health professionals, the child's dentist should be contacted.

This case study illustrates the need for more effective communication between dental and medical health professionals. While the child described above could have avoided an expensive and unnecessary hospitalization, it was appropriate that he was not placed on systemic antibiotics nor was he treated surgically. Pediatric nurses are an integral part of the health care team to help prevent misdiagnoses and inappropriate medical treatment of children who present with traumatic lip ulcers following dental local anesthesia.

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Figure 1.
Photo of Case Report Patient with Traumatic Ulcer of Right Lower Lip One Day After Dental Treatment Involving Mandibular Nerve Block Anesthesia (Photo Courtesy of Dr. Yousef Al-Yousef)

Table 1

Common Dental Procedures Requiring Local Anesthesia of Lower Teeth that May Increase the Risk for Traumatic Ulceration of the Lower Lip in Pediatric Dental Patients

- Dental restorations (fillings)
- Stainless steel crowns (caps)
- Pulpotomy, pulpectomy, or root canals (nerve treatment)
- Tooth extractions

Table 2

Clinical Protocols to Diagnose and Manage Children Presenting with Lip Biting Following Dental Local Anesthesia	
History Taking	• Take a complete medical and dental history • Ask about recent dental visits (within the past 3–5 days), particularly those that involved dental local anesthesia • Ask if lower or upper teeth were anesthetized
Clinical Assessment	• Determine if the traumatic lip ulcer is located on the same side of the mouth that was anesthetized • Check if the lip ulcer crosses the midline of the lip. Traumatic lip ulcers can present unilaterally or bilaterally, depending on whether the child received a unilateral or bilateral mandibular nerve block and how the child bit his or her lip • Examine the patient to identify the presence of additional intraoral ulcers. Traumatic lip ulcers can be accompanied by buccal mucosal (cheek) or tongue ulcers on the same side of mouth • Look for the five signs of infection: redness, pain, fever, swelling or edema, and generalized malaise. Redness and localized edema are common findings in traumatic lip ulcers. If the other signs are also present, the lip may be secondarily infected • Localized edema should not be confused with a purulent infection
Interventions	• If a diagnosis of lip biting secondary to dental local anesthesia is made, treat the ulcer palliatively with over-the-counter analgesics the patient reports pain. The patient can also be given a prescription for chlorhexidine gluconate (0.12%) that is used daily to gently debride the ulcerated tissue • No systemic antibiotics are indicated unless the lip becomes secondarily infected • No surgical intervention (e.g., incision and drainage) is indicated
Follow Up	• Reassure the caregiver that treatment of lip biting is limited to palliative care • Final healing can take up to several weeks • Ask the caregiver to contact the child's dentist to ensure proper follow up care • Educate the caregiver that the child should be closely monitored following future dental appointments that involve dental local anesthesia to prevent soft tissue trauma • Contact the child's dentist to ensure proper information sharing