

Case Study

Uvular bisection from child physical abuse

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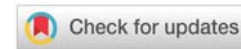
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Abstract

Oral injuries are common in abused children. In non-mobile infants, these injuries are often inflicted by various instruments, or by hands, fingers, or bottles during feedings. Subsequently, an infant may suffer lacerations/bruising to the tongue, alveolar mucosa, frenum, or the soft and/or hard palate. Rarely, pharyngeal or esophageal perforations may occur from penetrating trauma. This is a unique case of an infant with facial bruising who presented with oral and nasal bleeding and was ultimately discovered to have a palatal laceration with complete bisection of the uvula. Clinicians need to consider abuse when infants present with oral injuries.

Introduction

Although head, craniofacial, and neck injuries are commonly reported in nearly half of all child abuse cases, intraoral lesions and particularly injuries involving the palate are rarely reported. Intraoral injuries can involve foreign bodies, forced feeding, caustic or hot substances, or direct injury to hands or fingers. Dental neglect and sexual abuse injuries are also well characterized in both child abuse and dental literature to guide practice and highlight the importance of thorough examination to identify potential threats to children [1]. When paired with patterned bruising, as in this case, child physical abuse is the most likely etiology for the presentation and needs to be investigated.

Case presentation

A 4-week-old, previously healthy male product of an uncomplicated pregnancy and delivery presented to the

emergency room accompanied by mother and father with bleeding from the nares and mouth. The infant was examined in the nursery on admission and discharge and noted to have an intact palate. His oral exam was also completely normal on examination by his primary care clinician 1 week prior to presentation. Per the maternal report, the patient was at his baseline level of health three days prior to presentation when she first noted bruising on his cheek. He remained active, and alert, and demonstrated normal feeding patterns. However, on the day of the presentation, the father alerted the mother that the patient was bleeding from a large wound at the back of his throat. Mother suctioned blood from the patient's mouth and presented to the emergency department.

Physical exam in the emergency department was significant for two parallel, linear bruises to the left cheek (50 mm x 4 mm separated by 5 mm), three circular bruises on his right cheek (~5 mm), no abrasions, a defect of the posterior palate

that extended below the level of the tongue, erythematous tonsillar beds with white granulation tissue, bruising to the left and right palatine arches, no frenula tears, and dried blood in bilateral nares. The patient underwent a head CT that revealed no obvious bleed or fracture but demonstrated soft tissue gas in the parapharyngeal soft tissue. His lab workup was significant for an elevated aspartate transferase 77 (10 - 42 U/L) and creatine kinase 302 (52 - 200 U/L). The skeletal survey showed no acute or healing fracture.

The patient was admitted and seen by child protection medicine, trauma surgery, pediatric surgery, and plastic surgery. The patient underwent an exam under anesthesia with the placement of a Dingman retractor to visualize the full extent of the palate injury with photo documentation. While in the operating room, a midline, clearly traumatic laceration of the soft (posterior mobile) palate just distal to the hard (anterior) palate was visualized. The laceration was 20 mm through and through the entirety of the velum and uvula leaving a traumatic cleft in the palate with some sloughing of tissue along the midline (Figure 1) and displacement of the palate to the right. The wound was left to heal by secondary intention.

Inquiry regarding the causes of the facial bruising provided unclear etiologies including self-inflicted injury from scratching. The parents also offered a history of the patient moving his head with sufficient force against his caregiver's collar bones to cause the linear bruising. The oral bleeding was attributed to the repetitive rubbing of a large pacifier against the infant's soft palate. He was evaluated by his pediatrician one week prior to presentation where an anatomically normal palate without evidence of congenital cleft palate and no abnormal skin findings was documented.

As none of the histories provided were consistent with the physical exam findings, this infant was diagnosed as a victim of child abuse. During the law enforcement investigation, the patient's father confessed to inflicting the palate injury after forcefully inserting a medicine dropper into the infant's oropharynx (Figure 2). He was charged with reckless endangerment of another person, harassment, aggravated assault, endangering the welfare of a child, and simple assault.

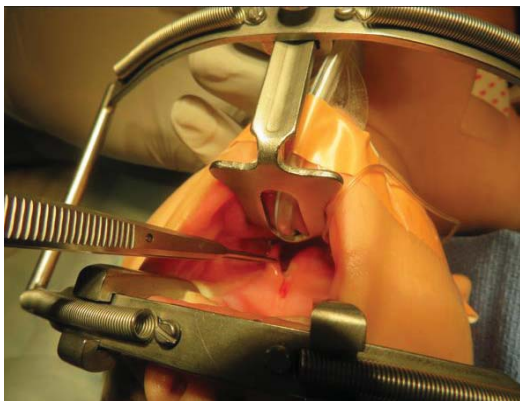


Figure 1: This figure demonstrates the injury to the soft palate sustained when the infant was force-fed with the syringe in Figure 2. The uvula was bisected and a laceration to the soft palate was sustained, causing significant bleeding, and necessitating an exam under anesthesia.



Figure 2: This figure demonstrates the syringe (which is normally utilized to administer medication) that was used to cause the soft palate and uvular trauma.

At the preliminary hearing, the judge determined there was enough evidence that a crime was committed by the defendant and thus would be held over for trial. The child was removed from the home and placed in kinship care while awaiting completion of the legal process. He will require follow-up with plastic surgery in approximately one year to evaluate palatal healing. In the event the wound does not close spontaneously, he will require surgical intervention to preserve his ability to phonate appropriately.

Discussion

Non-accidental trauma has been characterized throughout pediatric literature as it pertains to bruising, fractures, abusive head trauma, and neglect. While there are studies in the dental and pediatric literature explaining traumatic lesions to the head, oropharynx, and neck, these are fewer in number. One prospective observational study investigated intraoral injury secondary to endotracheal intubation and found that such injuries are uncommon, with only 1 in 105 participants sustaining injury from intubation. The study concluded that injury to the oral cavity, mandibular, or neck region should increase suspicion of abusive trauma [2]. The American Academy of Pediatrics clinical report suggests similar findings from craniofacial abusive injuries implicated in child abuse. Oral lesions are typically inflicted by forced penetration with instruments such as utensils [1]. Further, one prospective observational study noted that oral injuries in children less than two years old presenting to an emergency department were more likely the result of a traumatic injury and less likely to be found in non-mobile children [3]. While these studies suggest a correlation between oral injuries and child physical abuse, they also emphasize that the presence of oral injuries should prompt further evaluation and are not necessarily pathognomonic for abuse.

Studies have shown that, although rare, infants and toddlers may suffer foreign body impaction to the hard palate. Clinical presentation is often delayed due to inaccurate histories and diagnosis is impeded by difficulty in performing an oral exam. In these studies, child abuse was not suspected [4,5]. Accidental impairment of the palate occurs frequently



in mobile infants and children, with toothbrushes being the most common foreign body. The soft palate is usually impaled after the child falls while walking or running with the object in their mouth. Most of these injuries heal spontaneously without complication [6].

Physical abuse has been reported in 49% of infants and 38% of toddlers who sustain intraoral and facial trauma. A 14-month-old female who sustained a cleft of her soft palate, healing laceration on the left soft palate, and healing granulation tissue on the right, was recently reported. Although her uvula was deviated toward the left, it was otherwise normal. Unlike our patient who presented with facial bruising and oral-nasal bleeding, her diagnosis was significantly delayed due to misinterpretation of findings on the oral exam. The “white spot” on her soft palate was assessed as thrush. Similarly, to our case, no trauma history was provided, and the diagnosis was confirmed when she underwent an exam under anesthesia by an otolaryngologist [7].

Bruising is well characterized in the pediatric literature with large cross-sectional studies investigating the number, pattern, location, and distribution of bruising in children as it is often the first and sometimes only manifestation of non-accidental trauma. Studies have shown that over 80% of injuries result in only a single bruise except in the case of motor vehicle collisions [8]. Further, bruising is far more common over bony prominences such as the shins and increases with increasingly independent mobility. In other words, spontaneous bruising on non-mobile infants is extremely unlikely. A landmark, prospective, multi-center study validated the clinical decision rule that suggests bruising on the fleshy part of the cheeks, to a child younger than 4 years, multiple bruises with unexplained etiology, and patterned bruising are highly suggestive of physical abuse [9]. These findings suggest that the patient case detailed above warranted further investigation into the likelihood of childhood physical abuse. Because this non-mobile infant presented with oral bleeding and was found to have bruising to the fleshy part of his cheeks bilaterally, he underwent a focused exam under anesthesia. Child protection medicine and pediatric plastic surgery together determined that the evidence, in this case, suggested inflicted injury and was not explained by the presenting history provided by caregivers.

Conclusion

This case highlights the importance of a thorough physical exam and recognition of sentinel injuries. It also emphasizes that the multidisciplinary approach to care helped determine the true etiology of the abuse. Finally, it represents the only known case of uvular bisection sustained from child physical abuse in the literature.

Ethical approval

It is the policy of Lehigh Valley Health Network that a “single” case report (three or fewer cases) will not be reviewed by the IRB. Four or more case studies qualify as a research project and must be submitted to the IRB for review.

Contributors statement

Dr. Kuntzman drafted, reviewed, and revised the initial manuscript.

Dr. Esernio-Jenssen evaluated and diagnosed the patient as well as critically reviewed the manuscript for important intellectual content.

Dr. Wellington Davis III evaluated and continues to manage the patient for sequela related to the sustained trauma. He also critically reviewed the manuscript for important intellectual content.

All authors approved the final manuscript as submitted and agreed to be accountable for all aspects of the work.

References

1. Fisher-Owens SA, Lukefahr JL, Tate AR; American Academy Of Pediatrics, Section ON Oral Health; Committee on Child Abuse and Neglect; American Academy of Pediatric Dentistry, Council on Clinical Affairs, Council on Scientific Affairs; AD HOC Work Group on Child Abuse and Neglect. Oral and Dental Aspects of Child Abuse and Neglect. *Pediatrics*. 2017 Aug;140(2):e20171487. doi: 10.1542/peds.2017-1487. PMID: 28771417.
2. Lopez MR, Abd-Allah S, Deming DD, Piantini R, Young-Snodgrass A, Perkin R, Barcega B, Sheridan-Matney C. Oral, jaw, and neck injury in infants and children: from abusive trauma or intubation? *Pediatr Emerg Care*. 2014 May;30(5):305-10. doi: 10.1097/PEC.000000000000124. PMID: 24759489.
3. Woolf SM, Leventhal JM, Gaither JR, Hardikar P, Langan ML, Bechtel K, Auerbach MA, Tiyyagura G. Oral injuries in children less than 24 months of age in a pediatric emergency department. *Child Abuse Negl*. 2019 Mar; 89:70-77. doi: 10.1016/j.chiabu.2019.01.006. PMID: 30639971.
4. Khalaf M, Smaily H, Rassi S. Pediatric hard palate foreign bodies: Case report and Systematic review of the literature. *Int J Pediatr Otorhinolaryngol*. 2019 Dec; 127:109654. doi: 10.1016/j.ijporl.2019.109654. Epub 2019 Aug 21. PMID: 31450169.
5. Gushiken de Campos W, Braga MM, Junior CAL. Foreign Body in the Hard Palate of Infant. *Fetal Pediatr Pathol*. 2023 Feb;42(1):171-173. doi: 10.1080/15513815.2022.2061093. Epub 2022 Apr 6. PMID: 35383523.
6. Poutoglidis A, Tsetsos N, Forozidou E, Gougousis S, Tsentemidou A, Keramari S, Skalias A, Garefis K, Karamitsou P. Eight Month-Old-Infant Impaled by Toothbrush Through the Hard Palate. *Indian J Otolaryngol Head Neck Surg*. 2023 Jun;75(2):1177-1179. doi: 10.1007/s12070-022-03402-9. Epub 2023 Jan 9. PMID: 37275009; PMCID: PMC10235350.
7. Printz JN, Baker A, Carr M. Identifying Potential Child Abuse through Oral Examination. *Case Rep Pediatr*. 2017;2017:6943954. doi: 10.1155/2017/6943954. Epub 2017 Apr 2. PMID: 28469948; PMCID: PMC5392397.
8. Hibberd O, Nuttall D, Watson RE, Watkins WJ, Kemp AM, Maguire S. Childhood bruising distribution observed from eight mechanisms of unintentional injury. *Arch Dis Child*. 2017 Dec;102(12):1103-1109. doi: 10.1136/archdischild-2017-312847. Epub 2017 Aug 28. PMID: 28847881.
9. Pierce MC, Kaczor K, Lorenz DJ, Bertocci G, Fingarson AK, Makoroff K, Berger RP, Bennett B, Magana J, Staley S, Ramaiah V, Fortin K, Currie M, Herman BE, Herr S, Hymel KP, Jenny C, Sheehan K, Zuckerbraun N, Hickey S, Meyers G, Leventhal JM. Validation of a Clinical Decision Rule to Predict Abuse in Young Children Based on Bruising Characteristics. *JAMA Netw Open*. 2021 Apr 1;4(4):e215832. doi: 10.1001/jamanetworkopen.2021.5832. Erratum in: *JAMA Netw Open*. 2021 Sep 1;4(9):e2130136. PMID: 33852003; PMCID: PMC8047759.