Concurrent facial nerve palsy and uvula deviation after paediatric dental rehabilitation—A case report

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Abstract

Introduction: Facial nerve palsy is a rare, but known complication resulting from local anaesthesia (LA) infiltration during dental surgery. Its incidence is reported to be 1–1.1%, with short or long-term effects.

Case Report: A 6 years old well child underwent elective dental rehabilitation under general anaesthesia. For extractions, he received LA infiltration to the anterior part of the hard palate. In the immediate post-operative period, he presented with left sided facial droop and uvula deviation to the left with no hoarseness of voice or ptosis. His neurological symptoms resolved within 3 h of the administration of LA. He was reviewed on the same day by the paediatric neurologist. No further investigations were required. He was discharged well the next day.

Conclusion: Transient facial nerve palsy and uvula deviation, while rare, can occur after a dental procedure. For paediatric patients, the neurologist’s input helps with parental assurance.

Keywords

Uvula deviation, paediatric, dental, local anaesthesia, facial nerve palsy

Introduction

Local anesthesia (LA) is frequently used in dental procedures to minimize pain. They are commonly given before extractions for patient comfort and to facilitate the performance of the procedure. Complications that result from LA infiltration range from mild reactions such as blanching to severe reactions such as anaphylaxis and LA systemic toxicity. Adverse reactions following dental LA for tooth extraction was reported at 39.7%.

Neurological adverse effects that have been reported include trigeminal nerve injury of which the lingual nerve is affected in 77.8–89% and inferior alveolar nerve in 11–22.2%. Facial nerve palsy is a rare but known complication from LA. These tend to happen after an inferior alveolar nerve block but have also occurred after local infiltration. More rarely, is a case of uvula paralysis after inferior alveolar nerve block. We report a child with facial nerve palsy and uvula deviation after dental LA infiltration.

Case Report

A six years old boy, 18.6 kg 119 cm, presents for elective oral rehabilitation for early childhood caries. Pre-operative systemic examination and airway assessment were unremarkable.

Inhalational induction was performed with Sevoflurane 8% and nitrous oxide. After the child has achieved appropriate anesthesia depth, a 24G intravenous cannula was inserted on his right-hand dorsum and additional IV Propofol, IV Fentanyl and IV Atracurium was given to achieve intubating conditions. The child was intubated successfully on the first attempt with a PORTEX® (Smiths Medical ASD, Inc) #5.5 uncuffed endotracheal tube (ETT). He has a Cormack-Lehane Grade 1 view on direct laryngoscopy. A throat pack was inserted after confirmation of successful intubation and the dentist proceeded...
with the procedure. No trauma was noted at this stage. Anaesthesia was maintained with Sevoflurane and oxygen/air mixture achieving an end-tidal Sevoflurane concentration of between 2 to 2.4, and a minimum alveolar concentration between 1 and 1.1.

The dentist performed fillings to the occlusal surfaces of the upper right second primary molar, upper first primary molar and lower left and right second primary molars; and MTA pulpotomy crown to the lower left first primary molar. 1.8 mls of Evcaine (Lidocaine 2% with Adrenaline 1:80,000) was infiltrated to the upper anterior sulcus, anterior hard palate, upper left buccal sulcus and palatal mucosa, lower right buccal sulcus and lingual mucosa before extraction of upper right and left primary central incisors, upper left first primary molar and lower right first primary molar. The LA infiltration was given at approximately 1440H using a 22 mm long 30G needle, inserted approximately 5 mm at the upper left buccal sulcus. A diagram summarizing the dental procedure with the dental numbering system is shown in Figure 1.

At the end of the operation, the throat pack was removed. The airway was cleared of blood and secretions. Uvula deviation was not noted at this point. Neuromuscular blockade was reversed with IV Neostigmine and Atropine after checking the train of four. At 1515H, the child was extubated awake and transferred to the post anesthesia care unit (PACU). Just before extubation, a prominent left sided drooping of the mouth was noted when the child cried. There was also a loss of nasal-labial fold on the left. We did not note any gross inability to shut the eyes but this was hard to assess as the child was agitated. In the PACU, uvula deviation towards the left was noted when the child was crying. As the child was just emerging from anaesthesia, it was not possible to perform a full neurological examination. However, power in all four limbs was maintained, and there was no hoarse voice that was noted. After confirming with the caregiver that the facial droop and uvula deviation were new, a referral to the paediatric neurologist was made. Arrangements were made for the child to be admitted for observation. Figure 2 shows the left facial droop that is present post extubation.

The child was observed in the PACU for an hour while waiting for admission to the ward. In the ward, the child was reviewed by the medical team at 1720H (2 hours after the symptoms were first observed). The team noted the left facial droop but no uvula deviation. There was symmetrical wrinkling of the forehead, no ptosis, and he was able to close his eyes tightly. Facial sensation and hearing were intact. There was no tongue deviation and he was able to swallow fully. Trapezius power was also full. There were also no cerebellar signs such as dysmetria and dysdiadochokinesia. Romberg’s test was negative and there was no pronator drift. A complete neurological examination of the upper and lower limbs was performed and there were no other anomalies noted. The paediatric neurology team reviewed the child at 1740H and the left facial droop had completely resolved. The child was observed overnight in the hospital and discharged well the next day. A timeline of events is summarized in Figure 3.

Discussion

The overall incidence of adverse effects from LA administration for dental procedures has been reported to be between 4.5 to 26.2%.8–11 The incidence of transient paralysis of the facial nerve was reported to be 1–1.1%9,10 and usually attributed to an inferior alveolar nerve block. Uvula paralysis was described in one case report7 and it was also attributed to an inferior alveolar nerve block.

In general, nerve paralysis may be delayed or immediate. Immediate facial nerve paralysis may occur because of direct trauma from the needle, air blast during surgery, hematoma formation with nerve compression and LA infiltration of the peripheral branches of the facial nerve.12 In most patients, nerve paralysis is immediate and resolves within 7H.12 In delayed paralysis, reactivation of latent viral infection, ischemic neuritis from arterial spasms, or breakdown products of anaesthetic solutions have been cited as potential causes.4

In the case report where uvula deviation was reported post dental surgery, the inferior alveolar nerve block was performed. The uvula deviation could be caused by possible tracking of local anaesthesia along the hard palate to the soft palate and therefore, paralyzing the muscles of the uvula. Local trauma to the uvula from throat pack insertion can also masquerade as deviation. There is also a possibility of nerve stretch from prolonged opening of the mouth with instruments and manipulation/extractions of the molars.13 However, these reasons are less likely because the lingual nerve is usually affected if it was a stretch related injury.

In this patient, what is peculiar is the development of both facial nerve palsy and uvula deviation. With an injection volume of only 1.8 mL, it seems rather unusual that the facial nerve and vagus nerve were both anaesthetized. In addition, a left sided uvula deviation meant the right vagus nerve was affected. Anatomically, it is hard to fathom that the LA affected both the left facial nerve and right vagus nerve.

In the literature, facial nerve palsy tends to occur with an inferior alveolar nerve block which was not performed for this child. Possible postulations for the facial nerve palsy include:
inadvertent anaesthetizing of peripheral branches of the facial nerve or an aberrant course of the facial nerve; and Bell’s Palsy. About 50% of facial nerve palsy in children are classified as Bell’s palsy. In this child, Bell’s palsy is unlikely because the symptoms abated within the expected half-life of Lidocaine. Alternatively, facial nerve palsy occurring after General Anaesthesia may be due to mechanical causes such as jaw-thrust for mask ventilation. However, this child did not require prolonged periods of jaw-thrust peri-operatively, making this less likely.

The left sided uvula deviation was probably from a separate etiology. Possible reasons include: local trauma to the uvula from the throat pack, instrumentation during the procedure or less likely, LA injection to the lower right buccal mucosa affecting peripheral branches of the right vagus nerve.

In this case, the initial diagnosis of temporary neurological deficit from LA infiltration was made by the anaesthetist and dentist. There was full disclosure and open communication between the medical team and the parent. As there were two distinct neurological deficits, the paediatric neurologist was consulted expediently to rule out any other causes for the deficits. A joint decision was made for hospital admission to allow for overnight observation, possible investigations, and to allay parental concerns. Photos depicting the neurological deficit were obtained with the parent’s consent to document the evolving signs. With the paediatric neurologist’s involvement, the parent was reassured. The child was reviewed the next day and sent home after full recovery.

**Conclusion**

Facial nerve palsy and uvula deviation are rare complications following a dental procedure. While rare, these effects are due to inherent risks of the procedure including LA infiltration, throat pack insertion and instrumentation. In a paediatric patient, additional effort should be made to manage the psychological needs of the parent and child when complications occur. An expert opinion from an independent

**Figure 2.** Prominent left sided facial droop noted post extubation.

**Figure 3.** Timeline of events.
practitioner, when appropriate, should also be considered to further allay parental concerns.

Author Contribution
MHL, MMYK and SRKC contributed to the conception and analysis for the work, drafting and writing, review and editing of the manuscript, final approval of the version to the published and agreement to be accountable for all aspects of the work.

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Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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References
1. Ho JT, van Riet TC, Afrian Y, et al. Adverse effects following dental local anesthesia: a literature review. J Dent Anesth Pain Med 2021; 21(6): 507–525.
2. Hillerup S and Jensen R. Nerve injury caused by mandibular block analgesia. Int J Oral Maxillofac Surg 2006; 35: 437–443.
3. Garisto GA, Gaffen AS, Lawrence HP, et al. Occurrence of paresthesia after dental local anesthetic administration in the United States. J Am Dent Assoc 2010; 141: 836–844.
4. Tzemos PH, Cocos A, Kleftogiannis M, et al. Transient delayed facial nerve palsy after inferior alveolar nerve block anesthesia. Anesth Prog 2012; 59: 22–27.
5. Baart JA, van Diermen DE and van Eijden TM. Transient paresis after mandibular block anaesthesia. Ned Tijdschr Tandheelkd 2006; 113: 418–420.
6. Cakarer S, Can T, Cankaya B, et al. Peripheral facial nerve paralysis after upper third molar extraction. J Craniofac Surg 2010; 21: 1825–1827.
7. Sanchis JM and Peñarrocha M. Uvular paralysis after dental anesthesia. J Oral Maxillofac Surg 2002; 60: 1369–1371.
8. Daublander M, Müller R and Lipp MD. The incidence of complications associated with local anesthesia in dentistry. Anesth Prog 1997; 44: 132–141.
9. Kaufman E, Goharian S and Katz Y. Adverse reactions triggered by dental local anesthetics: a clinical survey. Anesth Prog 2000; 47: 134–138.
10. Brand HS, te Veldhuis AH and Baart JA. Adverse effect of local anaesthetics. Ned Tijdschr Tandheelkd 2009; 116: 235–238.
11. Boynes S, Riley A and Milbee S. Evaluating complications during intraoral administration of local anesthetics in a rural, portable special needs dental clinic. Spec Care Dentist 2014; 34: 241–245.
12. Bernsen PL. Peripheral facial nerve paralysis after local upper dental anesthesia. Eur Neurol 1993; 33: 90–91.
13. Burke RH and Adams JL. Immediate cranial nerve paralysis during removal of a mandibular third molar. Oral Surg Oral Med Oral Pathol 1987; 63: 172–174.
14. Ciorba A, Corazzi V, Conz V, et al. Facial nerve paralysis in children. World J Clin Cases 2015; 3(12): 973–979.
15. Dennis TG. Facial paralysis after general anesthesia. Anesthesiology 1986; 65: 516.