

Metal straw induced palatal mucosa traumatic injury: a case report

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Abstract

In an effort to care for the environment, the world has seen a decrease in recent years in the use of plastic objects. This has been the specific case for plastic straws. As the world moves towards banning the use of plastic in straws due to their impact on the environment, there has been a rise in the use of reusable metal straws. This shift towards the use of rigid metal for the production of straws has posed a public health threat when misused. The following case report describes the clinical management of palatal soft tissue trauma present in a 4-year-old male after an accident with a metal straw. He was taken by his parents to the emergency department at the American British Cowdray Medical Center in Santa Fe, Mexico City. Upon arrival at the emergency room, his triage was initiated, neurological status and oral injuries were assessed. After clinical and radiological examination (a CT Scan was performed), palatal fractures and dental traumas were ruled out. This report describes how this case was managed as well as its progress over a 12-month period.

Introduction

Approximately, 500 million disposable plastic straws are used every day by Americans. Shorelines around the world are littered with billions of plastic straws and some estimates indicate that 8 million tons of plastic float in the oceans, only nine percent of those are recycled. Major companies like Starbucks, Hyatt and American Airlines have banned plastic straws from their businesses. ⁽²⁾ Mexico has been no exception to ban plastic having started implementing this policy on January 1st, 2020. ⁽³⁾ An article published by The New York Times in 2019 ⁽¹⁾ reported that Starbucks would eliminate plastic straws by 2020 from its locations around the world. However, in 2016 they had to recall the stainless-steel straws that they were selling in their stores due to reports that three children in the United States and one in Canada had been lacerated by them. The same article described another downside seen by the ban on plastic straws. Many caregivers for people with disabilities rely on them to feed. The article's main focus was based on how a British woman was impaled in one eye by a metal straw after falling at her home while using one, dying 24-hours after, as a result of the injury. This is a unique report given that no scientific literature was found on similar cases. Most of the information found on this topic were newspaper articles reporting on incidents occurring with metal straws. The following case report regarding the

palatal injury sustained by a 4-year-old male while using a metal straw at home and its clinical management, may serve as a reference for caution to avoid future injuries and an algorithm for treatment.

Case Description

A 4-year-old male sustained palatal soft tissue trauma at home while simultaneously running and drinking from a metal straw that lacerated the palatal mucosa when the patient fell. Upon arrival to the emergency department at the American British Cowdray Medical Center in Santa Fe, Mexico City, his initial triage was initiated, neurological status and oral injuries were assessed. The patient had no significant medical history and no known drug allergies. The dentist on-call was the first responder and attending on the case. After clinical and radiological (CT) examinations ([Fig. 1](#)), palatal fractures and dental traumas were ruled out. Given the patient's age and location of the injury, it was decided to perform debridement and wound closure under general anesthesia. The patient was placed on a 4 hour fast in order to safely put him under anesthesia.

Description of treatment

Initial

Following medical clearance, under supervision of a pediatric anesthesiologist and the patient's pediatrician, a carpule of 2% lidocaine with 1:100,000 epinephrine was infiltrated around the injured tissue. The soft tissue and bone were irrigated with sterile saline for 3 minutes to remove blood clots and improve visual assessment of the injury. ([Fig. 2](#)) There was a 5mm by 4mm diameter laceration of the mucosa covering the hard palate, at approximately 10mm from the palatal margin of the maxillary right second deciduous molar. Chlorhexidine rinse was used to irrigate the area. Five Vycril 5-0 sutures were placed to close the wound. The patient remained in the hospital overnight under his pediatrician's orders for supervision, with IV fluids, antibiotic and pain medication.

Postoperative appointment #1 (1-day post-trauma)

Upon examination at the hospital before discharge, the patient seemed in good spirits, nurses reported that he had a good appetite was without pain or signs of infection. Postoperative instructions and prescriptions for ceftriaxone (500 mg, 3 intramuscular doses x 3 days), pediatric ibuprofen (2g/100ml q 4–6 h po prn pain), and 2% chlorhexidine oral rinse

were given to the patient, to be applied with a spray in case the patient would not be able to rinse without swallowing it. Postoperative instructions included the need to maintain excellent oral hygiene, remain on a soft diet and avoid hot foods for a week. A return appointment was made for 7 days later. (Fig. 3)

Postoperative appointment #2 (7-days post-trauma)

Remaining sutures were removed for the palate. The wound appeared clean and healing well. The patient's mother reported that the patient was active and feeding well. She was advised to continue maintaining good oral hygiene and that her son could resume normal diet. (Fig. 4)

Postoperative appointment #3 (4-weeks post-trauma)

The wound appeared clean and healed. The patient's mother was advised to return with her son in 6 months for his routine oral cleaning and wound check-up. (Fig. 5)

Postoperative appointment #4 (1-year post-trauma)

Patient failed to return for his 6-month visit due to the COVID-19 pandemic closures. A year after being injured, the patient's mother reported good healing but failed to attend his 1-year follow-up.

Discussion

Intra oral palatal lacerations by common feeding utensils like spoons ⁽⁴⁾, and also pharyngeal perforations with toothbrushes have been reported ⁽⁵⁾ in the pediatric dental literature since the 1980's. However, with the recent environmental concerns regarding plastic waste and the banning of plastic straws in various industries, there has been a corresponding rise in the reported occurrence of oral trauma associated with the use of metal straws. To date these reports have been found primarily in the public literature (The New York Times 2019, Reuters 2020, The Observer 2019). However, a Medline search of the dental and medical literature has failed to produce reports of oral trauma due to the use of metal straws and a protocol management in the pediatric patient.

Conclusion

As the world finds itself making a much-needed change in order to protect the environment from the accumulation of plastic waste, certain accommodations have been made which may prove to be detrimental to personal safety. In this

case, a family's effort to help protect the environment by the employment of a reusable metal straw by their four-year-old son, proved to be dangerous.

The key factor in the successful management of oral trauma in cases such as the one reported was evaluation of the nature and extent of trauma. This was achieved by debridement of the wound, oral and radiographic examination. Once it was determined that the wound was limited to palatal soft tissue, the behavioral management of a four-year-old was considered as a factor in performing the soft tissue repair. In this case it was determined to employ conscious sedation administered by a pediatric anesthesiologist. Following wound closure, the patient was placed on a soft diet and oral rinses. He was treated by order of his pediatrician with ceftriaxone (500 mg, 3 intramuscular doses x 3 days) and the parents were provided with instructions regarding how to maintain the patient's excellent oral hygiene. Follow-up appointments were provided in order to manage complications should they arise.

The author believes that warning labels on the packaging of metal straws are necessary to inform the public that their use should be limited to sitting while drinking. **(Fig. 6)** Walking or running while using a metal straw to drink may cause serious injury should a fall occur. If appropriate safety measures like the incorporation of a warning, in the form of graphic icon, are mandated for inclusion on the packaging of metal straws, then the rising number of injuries with these straws may be avoided while still caring for the environment.

References

- (1) Vigdor N. Fatal accident with metal straw highlights a risk. The New York Times; 2019. [cited 2019 July 11]. Available from: <https://www.nytimes.com/2019/07/11/world/europe/metal-straws-death.html>
- (2) DeVore J. In memoriam: saying goodbye to metal straws, 2018's LiveStrong bracelet. The Observer; 2019. [cited 2019 February 1]. Available from: <https://observer.com/2019/01/plastic-straw-ban-goodbye-metal-straws-reusable-straws/>
- (3) Solomon DB, Angulo S. Mexico City goes back to the future with plastic bag ban. Reuters; 2020. [Internet]. Available from: <https://observer.com/2019/01/plastic-straw-ban-goodbye-metal-straws-reusable-straws/>
- (4) Cornelio-Nieto J.O., Rodriguez-Murillo R.M., Ramirez-Aguilera M.J., Lastra-Escudero L.G., Camejo-Reyes R.A. & Medecigo-Castelain E. Cerebral infarct secondary to an intra-oral injury from a spoon. Boletin Medico Del Hospital Infantil de Mexico. 1992; 49: 384-387.
- (5) Rowley H, Christian J, Dennis A. Pharyngeal perforation: An easily missed finding following intraoral injury. Journal of Accident and Emergency Medicine. 2007; 12: 145-146.

Figures and Radiographs



Fig. 1- CT Scan showed no fractures



Fig. 4- 1-week follow-up

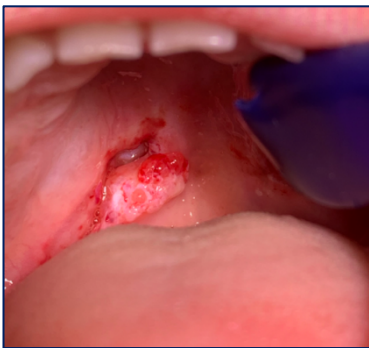


Fig. 2- Palatal laceration due to trauma with a metal straw



Fig. 5- 2-week follow-up

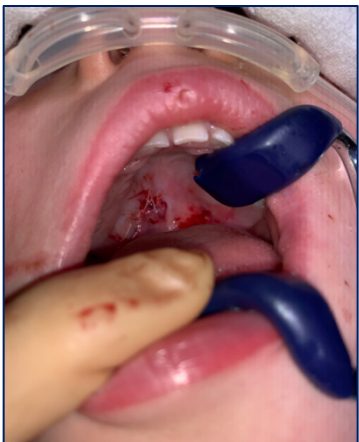


Fig. 3- Post-operative trauma repair



(Fig. 6) Warning ⚠ walking or running while use of this metal straw may cause injury upon falling!