Surgical management of impalement injuries of the soft palate: a case report
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Abstract
Penetrating injury to the oral cavity, although rare, may cause serious morbidity and mortality in the pediatric population. Impalement injuries are known to cause delayed vascular injury to the internal carotid artery, leading to significant neurologic sequelae. This paper presents a case of impalement injury of the soft palate in a 4 year old boy and its management.
Keywords: Impalement injury; Laceration of palate

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Introduction
Impalement injuries are relatively common in children and have an estimated annual incidence of 1-2% of all pediatric traumas. (1, 2) These injuries most commonly affect children aged 6 years or lesser because they often walk about sucking or holding objects in their mouth.(3) The most common objects causing impalement injuries are sticks, pencils, tooth brushes, toys, eating utensils etc. (1, 3)

Review of the literature reveals that most of these injuries may be managed by conservative approach followed by observation since the initial symptoms are limited with few further complications or long term sequelae.(2, 3) Though innocuous in appearance, for a small proportion of children, these type of injuries can result in several complications requiring active management, some of which are potentially life-threatening.(4, 5) Devastating neurological complications such as cerebral ischemia caused by thrombosis of the internal carotid artery can arise, and given the delayed onset of neurological signs, these life-threatening situations can be easily overlooked.

However, due to the paucity of such events there is no evidence base or clear, accepted consensus on a particular management protocol for these injuries.(2, 3) The present report describes the case of a 4-year old child managed by surgical intervention.

Case report
A 4-year old male patient accompanied by the parent reported to the opd of Department of Pedodontics and preventive dentistry, Vyddei Institute of Dental Sciences and Research Centre, Bangalore, with the chief complaint of cuts in the mouth since a day, associated with difficulty in swallowing food.

History revealed that the child was playing with a teaspoon in his mouth, noticing which the parent approached the child and tried to pull the spoon from the child’s mouth. The child being reluctant to give away the spoon tried to resist the parent’s action and forcefully held the non-feeding side of the spoon in the mouth, which accidentally hit the palate.

The child was taken to a local doctor immediately because there was significant bleeding, where the patient was prescribed analgesic syrup and referred to our hospital. On arrival, his airway seemed secure, but there was significant clotted blood and mucus in the oral cavity. The patient had difficulty in swallowing, but did appear neurologically intact. However, complete intra-oral examination was not possible due to the level of patient agitation. Hence, a decision was taken to complete the examination and treat the child under general anesthesia. The entire procedure and the potential risks of general anesthesia were explained to the parent and informed oral and written consent were obtained.

Intra oral examination revealed two deep lacerations in the anterior and middle part of the soft palate approximately 2x1.5 cm in size. There were no signs of similar injuries intra-orally and palpation revealed no foreign body impalement. The wounds were debrided, cleaned with betadine antiseptic solution. The mucosal tears were deep and seemed to warrant the need for approximation of the tissue ends by suture placement. Hence, a number 4-0 vicryl sutures were placed. The patient was given amoxycillin 125 mg tds.

The patient tolerated the procedure well and was kept under observation overnight. On discharge, he was given a 5-day course of amoxyillin syrup, 125mg / 5 ml and paracetamol 120 mg prn. Instructions were given to follow a soft diet for 7 days and parent was instructed to closely observe the child for 48-72
hours and to report back if any symptoms such as decreased level of consciousness, irritability, vomiting, weakness of arms or legs, headache, blurred vision, convulsions etc., were observed.

The patient was reviewed at 7 and 30 days interval post operatively. The mucosal defect had healed well with no inadvertent post-operative symptoms.

Discussion

Toddlers are particularly at risk as they tend to use potentially dangerous objects for oral stimulation, and also more likely to fall. (2, 5) The mechanisms of injury in decreasing order of frequency are a) falling on an object carried in the mouth b) direct force applied to an object being held in the mouth c) falling or running into a stationary object with the mouth open. (1) The mechanism of injury in the present case seems to fall into the second category.

Impalement injuries of the oral cavity are most common at a mean age of 4 years (1) with a strong male predominance of up to 3:1. (6)

Management of impalement injuries in children includes complete examination to note signs or symptoms of the following:

- Airway obstruction
- Uncontrolled hemorrhage
- Acute infection (eg. Pyrexia, nausea, swelling of the cervical soft tissues)
- Neurological changes (eg. Focal neurological changes, alterations in mental status, nausea, vomiting)
- Gross mucosal tears which may be in need of suturing. (7)

A thorough medical history, followed by careful clinical and radiographic examination is indispensable. This, coupled with a sound knowledge of surgical anatomy, pathology and microbiology, will allow the clinician to accurately assess the injuries and the inherent potential risks.

Neurological sequelae secondary to carotid artery injury are catastrophic but rare; with only very few reported cases in the literature (2) as such, there is a great deal of emphasis on the rarest of sequelae in the available publications on the topic. On the other hand the commoner developments pertaining to infections and lacerations requiring interventions have been largely ignored. (8, 9)

Chauhan et al speculated that the intimate anatomic relationship between the parapharyngeal space and the oral cavity, the potential for implantation for anaerobic organisms into the floor of the mouth by the penetrating objects, and perhaps even the effect of gravity and wound exposure to saliva are contributing. In the present case, due to the patients’ anxiety and level of co-operation, complete examination and treatment of the injury was undertaken under general anesthesia. The intra oral examination of a young child can be difficult for several reasons:

- The relatively poor access for examination offered by a small oral cavity
- The minimal cooperation that young children can sometimes give
- The distress to a young child following a traumatic incidence may mean the child will no longer cooperate with strangers (i.e., dental or medical personnel) and can resist the attempt to view a traumatized area.

Hence, good visualization and assessment of an intra-oral laceration may often prove difficult. Incomplete examination will give little/no indication as to the depth of the laceration and its degree of penetration through into the deeper tissues. Little indication of the seriousness of the trauma may be evident. Infection can occur through the oral micro-flora that is carried into the deeper tissues with the initial injury or later through the mucosal laceration itself. This can then spread rapidly into the surrounding tissues and have life-threatening consequences. (7) Since a clinical examination was difficult in our case owing to the child’s agitated condition and accumulation of blood and mucus over the wound, it called for examination under general anesthesia and confirmed our suspicions of requirement of repair.

Conclusion

Though the literature highlights the management of such injuries on an outpatient setting, by and large, the present case indicates the need for examination and also management of such an injury in a hospital set up under general anesthesia, pointing out that every case needs to be managed individually and separately. A thorough clinical examination and post-trauma monitoring is essential even with apparently minor laceration as the depth of penetration and its effect on the deeper tissues are difficult to assess clinically.

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