

## Case Report

### **PALATAL IMPALEMENT INJURY WITH RETAINED FOREIGN BODY IN A CHILD: CASE REPORT AND LITERATURE REVIEW**

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#### **ABSTRACT**

Impalement injuries are uncommon in the head and neck region, and when associated with retained foreign body present a challenge to the clinician with regards to management. This type of injury may occasionally be associated with life threatening complications or permanent disability. Therefore, clinicians involved in the management of head and neck trauma need to be constantly reminded of this uncommon type of injury and the different treatment options.

This is a case report of impalement injury to the palate of a child by a hair weaving instrument. Clinical and plain radiographic examination was sufficient for foreign body localization. The foreign body was successfully extricated under local anaesthesia and conscious sedation using a simple conservative technique with no complications.

**Keywords:** child; impalement; palate; local anaesthesia

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## Introduction

Impalement injuries are defined as injuries which incorporates components of both penetrating and blunt trauma (Sikes et al., 2003). It results from penetration by a rigid blunt tipped object through one or more anatomical regions and often impacted when patient present (Arashiro et al., 2001). This type of injury have been reported in various body regions such as the thoracoabdominal and the perianal regions (Thomson and Knight, 2000), however they are relatively uncommon in the head and neck region (Belfer et al., 1994; Sikes et al., 2003; Pereira et al., 2005; Edwin et al., 2009). Children are most commonly affected and majority of these injuries are minor and heal without complications (Domarus and Wilma, 1983; Pereira et al., 2005; Syebele et al., 2012). However, such injuries may be associated with immediate or delayed life threatening complications (Belfer et al., 1994).

We present a case of impaled hair-weaving instrument through the palate into the nasopharynx of a 4-year female child. Our management is highlighted with a review of the literature.

## Case Report

A 4-year-old female was rushed into our accident/emergency department with a 30 minutes' history of injury to the mouth. She was said to be holding a hair weaving instrument in her mouth while playing with her friends and this was accidentally pushed further up into her mouth. There was no history of loss of consciousness but she had a history of epistaxis and bleeding from the oral cavity. Systemic history was not significant.

On examination, she was well oriented and in no obvious distress. A metallic object of unknown length was projecting from her mouth (figure 1). Clotted blood was noted on the right nostril but no evidence of cerebrospinal fluid (CSF) rhinorrhoea.

Intraoral examination revealed a metallic object projecting through the posterior part of the hard palate on the right side (figure 1). There was no evidence of neurological deficit or any other significant findings. An assessment of palatal impalement injury with foreign body impaction was made and plain radiographs requested.

**Fig 1: Impaled hair-weaving object at presentation**



On a lateral radiograph of the skull and jaws, a radiopaque foreign body measuring about 16cm in length was seen projecting with its bulbous hooked end through the posterior part of the hard palate into the upper part of the nasopharynx, close to the skull base (figure 2).

**Fig 2: Lateral skull X-ray showing blunt end of impaled object transversing the palate into the nasopharynx close to the skull base.**



Based on the clinical and radiographic findings, a decision was made to extricate the foreign body at the accident and emergency ward. Under local anaesthesia and conscious sedation using diazepam with the patient in a sitting position and the neck slightly flexed to prevent aspiration in an event of profuse hemorrhage following extrication, the extra oral part of the object was grasped with a forcep and gently manipulated by rotating it together with an outward traction in the perceived path of entry. The foreign body was successfully disimpacted (figure 3) with minimal bleeding into the oral cavity. The soft tissue injury to the palate was sutured (figure 4) and patient placed on antibiotics and analgesic with an instruction to the parents for her to commence warm saline mouth bath the next day. Patient is recovering well without any residual complications and she is currently on an outpatient review.

#### Discussion

Impalement injuries commonly affect the torso and the limbs due to the greater surface area and the relative ease with which the etiologic agents can

penetrate these regions (Alessandro et al., 2006). Children between the ages of 2-6 years are most at risk of sustaining impalement injuries despite the fact that this age group is less involved in oral and maxillofacial injuries as a result of their peculiar anatomy and a largely protected lifestyle (Belfer et al., 1994; Adebayo and Ajike, 2008). Their greater involvement in impalement injuries has been attributed to the increased tendency to carry dangerous objects into their mouth and to their lack of coordination leading to falls (Belfer et al., 1994). The age of our patient (4 years) is consistent with the literature.

The aetiological agent in impalement injuries of the oral and maxillofacial region documented includes plastic toothbrush, pen, comb, crochet needle and hair-weaving instrument. To the best of our knowledge, only a single case (Sikes et al., 2003) of hair-weaving impalement injury to the oral and maxillofacial region exists in the literature.

Clinical presentation will among others depend on the anatomical boundaries transverse by the impaling object, time between injury and hospital presentation, and whether attempt was made to extricate impaled object by untrained personnel at home (causing further injuries). The patient in this case report presented with no serious complication. This may be due to the fact that extrication was not attempted at home, and due to the location on the palate. However, lateral palatal injuries are more likely to result in neurologic complications from internal carotid artery injury (Hengerer et al., 1984).

**Fig 3: Impaled hair-weaving object after extrication**



Imaging of the foreign body is vital in patient assessment to determine its nature, the structures transverse and its final localization. Plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), angiography and ultrasound are possible options depending on the clinical presentation (Sikes et al., 2003). Carotid injuries are best evaluated using CT angiography, although magnetic resonance angiography shows promising results without the risk associated with invasive techniques (Suskind et al., 1997; Pereira et al., 2005). Our patient was reviewed only with a plain radiograph and this was adequate since it was a metallic object and localized in a “safe zone”. It is of interest to note that the impalement injury in this case report was with the blunt end of the instrument and not with the sharp end as should normally be expected.

Treatment should be based on the ABCD protocol of the advanced trauma life support (ATLS). Airway maintenance and control of haemorrhage are essential. A multidisciplinary approach is recommended where more than one anatomical boundary is involved. This will assist in deciding which of the methods with the minimum risk should be used in extricating the impaled object.

The object may be removed surgically (open or endoscopic) or non-surgically depending on certain factors such as risk of haemorrhage and presence of associated injuries requiring treatment (Hellmann et al., 1993; Alessandro et al., 2006). For the patient in this case report, the impacting instrument was extricated non-surgically under local anaesthesia and conscious sedation. With a rotational motion and outward traction in the possible path of entry, the instrument was successfully removed with minimal bleeding. Understanding the path of travel and the nature of the impaled object are of importance in avoiding further injury during non-surgical extrication. The use of local anaesthesia with conscious sedation in this patient gave a satisfactory result, avoiding some of the reported risk associated with general anaesthesia in children such as bradycardia and tachycardia.

Antibiotic coverage following removal of impaled foreign bodies have been recommended to prevent devastating infections especially when the impaled object is in a potential space such as the parapharyngeal space, or in the intracranial cavity (Sikes et al., 2003; Alessandro et al., 2006). Antibiotic chosen should take into consideration the mixed flora of the oral cavity.

**Figure 4; Sutured perforated palatal tissue following extrication of foreign body**



Most patients present with minor injury and heal without complications following impalement injury, although some may present with immediate or delayed life threatening complications such as carotid artery thrombosis (Pereira et al., 2005). Complications have been known to occur 3 to 48 hrs following injury (Hengerer et al., 1984). Although out patient management has been advocated for most patients (Hellmann et al., 1993), it is our opinion that each case should be weighed. The anatomic regions transverse, medical history (bleeding disorders, risk of infection) , distance from home to the nearest medical facility and whether the patient reside alone at home should among other factors help in decision making. We discharged our patient home after about 24 hours (with an instruction to the parents for her to present for regular review) because she resides not far from the teaching hospital.

**Conclusion:** Though impalement injury to the head and neck region is rare, an understanding of its management is vital in reducing morbidity and mortality. Parents and child care givers should be well informed about treatment and the preventive strategies.

Competing interest: The authors declare that they have no competing interest in whatever form in the publication of this article.

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