

AN UNUSUAL HARD PALATE INJURY CAUSING BLINDNESS- A CASE REPORT

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Article Received on 14/05/2020

Article Revised on 16/05/2020

Article Accepted on 19/05/2020

ABSTRACT

Palatal injuries are more common in younger population while playing with sharp objects like wooden stick, pipe, straw, pen, pencil etc either by accidental pushing the object inside the mouth or by falling down with object inside and usually involved the soft palate. Perforated Hard palatal injury is quite uncommon in the adult population. Blindness due to hard palate injury is very unusual. Presented to our emergency was a case of hard palate injury with loss of visual acuity of right eye following a history of fall while playing with wooden stick. Primary repair of the wound with foreign body removal was done and there was no complication seen after the surgery. This case report review unusual complication caused by palatal perforation and management options for such injury.

KEYWORDS: Hard palate, perforation, blindness.**INTRODUCTION**

Palatal injuries are mostly seen in soft palate region and may involve the nearby anatomical structures like uvula, posterior pharyngeal wall, anterior and posterior pillars of the tonsils. The injury is usually caused by objects like wooden stick, pipe, hair comb, pen, pencil etc. Palatal injuries are seen more commonly in pediatric age group.^[1] The related complications including major vascular or nerve damage, airway obstructions and aspiration, may lead to severe morbidity and mortality.^[2] Palatal injuries in adult are very unusual and are due to assault or road traffic accidents.^[3]

Palatal injuries can result into major neurovascular complications. Therefore, thorough neurological examination and investigation to rule out neurovascular injury should be the prime concern. The mechanism involves injury to the intima of the carotid artery with formation of a thrombus, which can take several days. Computed tomography (CT) with angiography (CTA), MRI can help detect vascular injury but may not be necessary in all patients with palate trauma.^[4]

The foreign body may be located closely adjacent to the critical vessels and nerves. It is thus important to plan the OT under general anesthesia to limit the patients movement and avoid further injuries to the adjacent tissues and organs.^[5]

The aim of presenting this rare case is to emphasize that perforated injury to the hard palate can lead to serious

and life threatening complication requiring immediate intervention. Therefore, early diagnosis and treatment is very crucial.

CASE REPORT

A 13-year-old male was brought to our emergency unit by his family 2 hour after a history of fall from height while playing with bamboo stick. He presented to our casualty with pain, bleeding from oral cavity, drooling of saliva and foreign body in the roof of the oral cavity. Since the time of incident there has not been much blood loss (as described by the attendant about 15-20 ml blood loss) neither was there any sign of hypovolemic shock at the time of presentation.

General examination reveal temperature of 37.0 degree celcius ; pulse rate of 70 bpm; respiratory rate of 17 cpm. On local Examination of the oral cavity revealed perforated wound in the posterior part of hard palate with irregular margins measuring about 4cm X 1.5cm with a small piece of foreign body (bamboo stick) in situ which was hard on palpation, no active bleeding seen. Other ENT examinations were normal, examination of the eye showed ptosis of the right eye with loss of vision. Ophthalmologist opinion was taken, CT Brain, nose and PNS, and MRI Orbit was advised and reports suggestive of internal ophthalmoplegia of the right eye. systemic examination were all within normal limit.

Investigation

Blood R/E (within normal limit), NECT scan brain shows no abnormality, FAST (within normal limit) and CT –scan of faciomaxillary region showed there is fracture of the ethmoid bone with fluid density in the nasal cavity extending into the medial side of the orbit. MRI Orbit revealed fracture involving right lamina papyracea with mild T2 and FLAIR preineural hyperintensity surrounding the right optic nerve suggestive of inflammatory changes. There is defect involving the hard palate with superior extension of the breach to involve turbinates, nasal septum forming oronasal fistula.

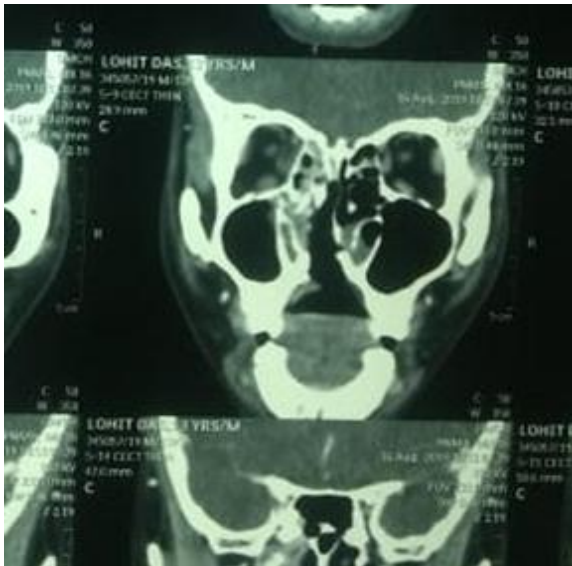


Figure 1: CT scan shows defect involving the hard palate with superior extension of the breach to involve turbinates, nasal septum, fracture of the ethmoid bone and lamina papyracea.

Treatment

After admission the patient was kept nil per oral, intravenous fluids and injectable antibiotics (ceftriaxone +sulbactam) was started. Patient was shifted to the OT after the MRI report which revealed no involvement of major vessels. Under general anaesthesia thorough wound debridement was done, its depth of extension was inspected with transoral endoscopic guidance and subsequently the impacted foreign body was removed safely with minimal bleeding seen. Wound repaired with 3-0 vicryl interrupted sutures after thorough wound debridement, hemostasis achieved.

Immediately after the surgery the patient was put on nil per oral for 8 hours and was allowed to start on liquid diet through nasogastric tube thereafter.



Figure 2: Pre operative picture showing palatal perforation.



Figure 3: picture showing a 4 cm X 1.5 cm wooden stick removed from the hard palate.



Figure 4: Post Operative Picture Showing Wound Closure.

Follow up

On the 7 day post surgery the wound healing was much better with no gapping, but there was no improvement of visual acuity of the affected eye. Hence, after Ophthalmological check up and clearance, the patient

was discharged on the same day in good condition with all the vitals stable. Out patient Follow up of the patient remained uneventful, wound healed well, but with blindness of right eye.

DISCUSSION

Hard palate is an important anatomical structure separating the oral cavity from the nasal cavity. It is composed of the palatine process of the maxilla covered by palatine muscles and mucosal layer.^[6] The most common cause of palatal perforation is trauma leading to oronasal fistula. Palatal perforation can present as a rare complication of septoplasty which can be avoided by careful examination of the patient before surgery.^[11]

Other causes of palatal perforation can be due to failure of the palatal shelves to fuse completely during the embryonic life, iron folic acid deficiency, smoking and drinking alcohol during pregnancy are important factor causing palatal defect. Certain infection (viral, bacterial), autoimmune diseases, use of steroid and anticonvulsant therapy are some of the known factors causing cleft palate.^[7]

Palatal injuries are frequently encounter in the pediatrics age group the reason beign that children have the tendency of inserting objects into their mouth like pointy end of combs, spoons, pen, bamboo stick, toothbrush etc.^[8]

The injuries occurs by accidentally pushing the objects inside or due to falling down while the object in the mouth and Commonly involves the soft palate. Nearby anatomical structure may also be involved like uvula, anterior and posterior pillar of the tonsils etc.^[10]

Most of the palatal injuries were reported to be not very harmful. Injury with sharp objects may perforate the soft palate leading to air collection in the retropharyngeal space if enough force is delivered. Impacted foreign bodies may require surgical exploration for removal.^[9]

By presenting this paper we convey an unusual case of blindness due to penetrating hard palate injury as orbital involvement is unexpected in such injuries. So far as we know such case has not been reported in English literature.

Surgical anatomy

The anatomical relationship of the orbit to the nose and paranasal sinus gives it a great importance to the otorhinolaryngologist. The orbit composed of 7 distinct bones: maxilla, zygomatic, ethmoid, lacrimal, sphenoid, frontal, and palatine bones all of which make unique contribution to each orbital wall.

The medial wall is of most significance to the otorhinolaryngologist. It is composed of: the frontal process of the maxilla, the lacrimal bone, the lamina papyracea of the ethmoid and the body of the sphenoid.

The paper-thin bone, the lamina papyracea (arise from the ethmoid bone) makes up majority of the medial orbital wall. The roof is formed by the frontal bone. The inferior wall formed by orbital surface of the maxilla, the zygomatic and the palatine bone. Medial to the infraorbital nerve, the orbital floor is thin and fractures more easily. The zygomatic process of the frontal bone, the orbital surface of the zygoma and the greater wing of sphenoid form the lateral wall.^[12] The IOF transmits the maxillary nerve (CN V2) and infraorbital vessels, and it communicates with the infratemporal and pterygomaxillary fossae. The lateral portion of the IOF is an important surgical landmark for positioning lateral orbital osteotomies during anterior skull base resections. The optic canal transmits the optic nerve (CN II) and the ophthalmic artery.^[12]

Naso-orbito-ethmoid (NOE) fractures involve the anatomical confluence of the nose, orbits and ethmoids. This is a complex area and these injuries are often overlooked. Reconstruction at a later date is extremely difficult. The most useful classification of these injuries was devised by Markowitz et al who defined them in terms of their attachment to the medial canthal ligaments.^[13]

Classification of naso-orbito-ethmoid complex fractures:

Type I: in which the medial canthal tendon is intact and connected to a single large fracture fragment
Type II: the fracture is comminuted, and the medial canthal tendon is attached to a single bone fragment
Type III: comminution extends to the medial canthal tendon insertion site on the anterior medial orbital wall at the level of the lacrimal fossa, with resultant avulsion of the tendon.^[13]

In our case there was defect involving the hard palate with superior extension of the breach to involve turbinates, nasal septum forming oronasal fistula. The fracture extents to the ethmoid bone involving right lamina papyracea with preineural edema surrounding the right optic nerve. However, major vessels in this case was not involved.

CONCLUSION

Palatal injury is quite common especially soft palate but blindness due to palatal injury is very unusual. Most of the palatal injuries were reported to be not very harmful. However, Injury with sharp objects may perforate the palate leading to serious life threatening complication including major vascular or nerve damage (leading to blindness) or even airway obstructions. Therefore early diagnose and surgical intervention is very crucial in this case.

Consent: Written and informed consent was taken from the patient, patient's guardians regarding the use of his pictures, clinical findings, reports of the investigations that were conducted and intra-operative findings.

Conflicts of Interest: None.

Funding: None.

KEY POINTS

1. Hard palate perforated injury with blindness is very rare.
2. Hard palatal injury with blindness is diagnosed by CT Scan faciomaxillary region.
3. Early diagnosis and surgical intervention is utmost important in case of hard palatal perforation to avoid serious complication.
4. Complication related to hard palate perforation includes fracture nasal septum, fracture ethmoid bone, fracture to lamina papyracea and neurovascular complication.

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