

Endoscopic-assisted Removal of an Impaled Rebar through the Face: a Case Report

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ABSTRACT

Background: When a foreign body (FB) traverses or penetrates a body cavity or extremity is called impalement injury. Impalement injuries to the craniofacial region are rare. Surgical approaches should be chosen according to the patterns, mechanisms, materials of the injury, and adjacent vital structures. Current case report aimed to introduce endoscopic- assisted approach as a novel technique in removing penetrating foreign body of the orbit and paranasal sinuses. **Case Presentation:** A thirty-year-old man was brought to the emergency department with a rebar penetrated into his left side of his face just superior to his orbital rim, through the orbit, adjacent to medial canthus. Computed tomography scan showed a metallic rod extending from area near medial canthus up to pterygoid plates. Patient underwent endoscopic assisted surgery under general anesthesia. After releasing of the rebar endoscopically, it was pulled out from the proximal portion. **Conclusion:** Endoscopic-assisted surgery is a useful and novel approach in removing impacted FBs in PNS, particularly the FBs adjacent to arterial or venous plexus, dura, and the orbit.

Keywords: Foreign Bodies Paranasal Sinuses Transanal Endoscopic Surgery

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INTRODUCTION

Retained foreign bodies (FBs) in the facial area as a consequence of penetrating injuries from intentional knife wounds (Jael's syndrome) and accidental sharp materials can arouse considerable anxiety in the clinicians. These penetrating injuries can be superficial or deep, and they may be potentially fatal when the main blood vessels of the face receive an injury (1-3). FBs in the paranasal sinuses should be removed as soon as possible. A retained FB can lead to rhinosinusitis, FB granuloma formation, and cutaneous fistula (4-6).

We present a case of penetrating FB inserted into the orbit and maxillary sinus towards pterygopalatine fossa. Current case report aimed to introduce endoscopic- assisted approach as a novel technique in removing penetrating foreign bodies of paranasal sinuses.

CASE PRESENTATION

A thirty-year-old man was brought to the emergency department with a rebar impaled through left side of his face just above to the orbital rim, through the orbital cavity, adjacent to medial canthus (Figure1).

The patient was conscious and vital signs were stable. On examination, eye movements and visual acuity on the left side was not amenable to testing. The rod was completely lodged. Maxillofacial computed tomography scan showed a metallic rod extending from area near medial canthus up to pterygoid plates (Figure 2).

Patient was transferred to the operation room immediately. Under general anesthesia, the globe was examined and surprisingly there was no injury to the globe except for some hemorrhage. Preoperative shrinkage of the nasal mucosa was performed using with gauze strips soaked in adrenaline (1:100000). Uncinectomy and wide antrostomy was performed via an endoscopic approach with 0 degree Hopkins rod endoscope. Blood clots were suctioned out from the maxillary sinus. The posterior wall of left maxillary sinus was resected completely using 0 degree and 30 degree Hopkins rod endoscopes. Pieces of medial pterygoid plate were removed from pterygoplatine fossa. After releasing of the rebar endoscopically, it was pulled out from the proximal portion (Figure 3). The site of penetration was sutured in multiple layers with 3-0 Vicryl and 4-0 nylon suture material. Patient had an uneventful surgery. On his post-operation examination his eye movements and visual acuity were normal. Antibiotic and normal saline nasal irrigation were prescribed as post-operative care. Endoscopic sinus examination one month post-operation revealed a maxillary sinus with a wide middle meatal antrostomy, normal nasal cavity mucosa without any adhesion bands. A relatively acceptable facial scar was seen.

DISCUSSION

When a foreign body (FB) traverses or penetrates a body cavity or extremity is called impalement injury. Impalement injuries nowadays are uncommon and are generally a consequence of a road accident or a fall onto a blunt object (7). These injuries oc-



Figure 1. A conscious patient with penetrating trauma to the left side of his face adjacent to the medial canthus by a rebar

cur much more frequently on the trunk and extremities because of their surface areas and the object may penetrate them easily. Impalement injuries to the craniofacial region are rare due to the fact that the face is a smaller target in comparison with the rest of the body, defense mechanisms that either move the face away from the coming object or permit it only to be deflected away without being penetrated (8, 9).

The vast majority of nasal and paranasal injuries and retained FBs are found in the maxillary sinuses. FBs in the maxillary sinuses account for 50% to 75% of them (10-12). PNS FBs may occur through various traumatic or iatrogenic incidents. Traumatic incidents include knife, rebar, bullets from gunshot injuries, pellets, wood, and iatrogenic ones such as pieces of broken forceps, teeth, etc (13-16).

The diagnostic approach starts with complete medical history, otolaryngology examination, and appropriate radiographs. Every patient who comes to the emergency department with blast injuries and penetrating trauma should undergo preoperative imaging. Waters and lateral skull views are helpful in diagnosing FB and computed tomography (CT) scan can be effectively used to evaluate the presence and precise location of FB to adjacent vital structures (11, 17, 18). In some cases angiography may be necessary.

FBs in the PNS must be removed as soon as possible. A retained FB can lead to rhinosinusitis, cutaneous fistula, FB granuloma, anthrolith, rhinolith, and even malignant mucosal transformation. The treatment guidelines for a penetrating maxillofacial injury or an impaled facial FB are to decompress, debride, and avoid vascular and neural injury and the consequent complications. A multidisciplinary surgical management is sometimes required. There are various surgical techniques for removing PNS FBs. Location of FB may require a variety of surgical techniques. Approaches of surgery should be chosen according to the patterns, mechanisms, materials of the injury, and adjacent vital structures. Small FBs can easily be removed endoscopically, whereas the classic open

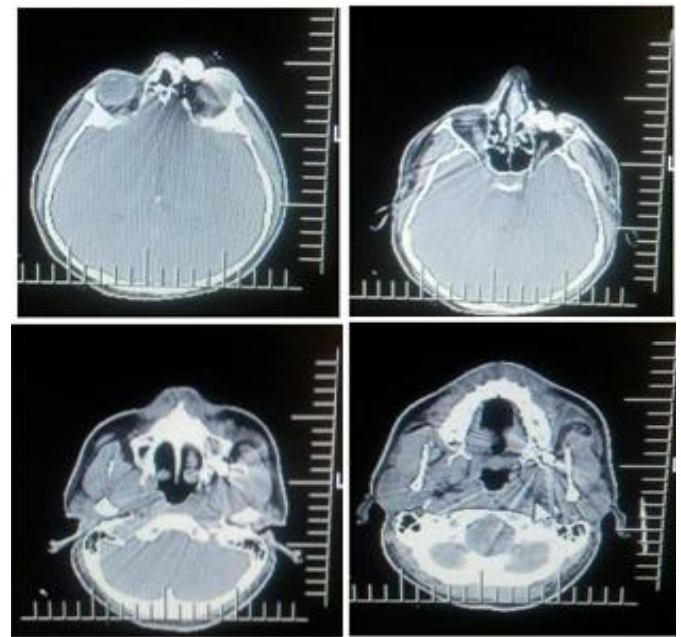


Figure 2. Computed tomography (CT) scan showing foreign body penetrating left maxillary sinus towards left pterygopalatine fossa

surgical techniques would be preferable in large FBs (19-24).

To the best of our knowledge, this is the first time that endoscopic-assisted surgery was successfully used to remove an impaled FB such as rebar or knife from PNS. The surgical technique used in this case was novel because the tip and body of the metallic FB were inside the pterygopalatine fossa and FB was impacted in the maxillary sinus. However, if it had not been carefully planned and executed it is important to highlight that it could lead to an uncontrolled bleeding from maxillary artery and/or pterygoid plexus. The posterior wall of left maxillary sinus was resected completely and therefore there was good access to pterygoid plexus and internal maxillary artery in case of any bleeding. After releasing the impacted part of FB endoscopically, it was pulled out from the proximal part without any serious vascular injury.

CONCLUSION

Impaled foreign bodies in the facial area and paranasal sinuses vary in their size and location. Surgical approach and technique of their removal depend on their shape, size, location and adjacent vital structures. Preoperative imaging is an excellent road map for choosing the best surgical approach. Endoscopic-assisted surgery is a useful and novel approach in removing impacted FBs in PNS, particularly the FBs adjacent to arterial or venous plexus, dura, and the orbit.

ETHICAL CONSIDERATION

A written informed consent was signed by patient for reporting his case. All the personal information remained anonymous.

CONFLICT OF INTERESTS

There are no conflicts of interest in terms of the present manuscript.

ABBREVIATIONS

CT; Computed tomography, FB; foreign body.

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