



SCARLESS INTRAORAL RETRIEVAL OF A DEEPLY EMBEDDED FOREIGN BODY FROM MAXILLARY SINUS

Oral & Maxillofacial Surgery

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ABSTRACT

Background: Penetrating maxillofacial trauma from high-velocity industrial machinery can cause deeply embedded foreign bodies that are easily overlooked during primary emergency evaluations. Left untreated, contaminated projectiles within the paranasal sinuses carry severe risks of chronic secondary infections and neurovascular damage, particularly in patients with systemic comorbidities like diabetes. **Case Presentation:** A 41-year-old male supervisor with well-controlled type II diabetes presented following an occupational facial injury caused by a fractured motorized brush cutter blade. Initial physical exploration revealed a deceptively minor 2×1 mm puncture wound lateral to the left ala of the nose. Computed tomography (CT) mapping revealed a large metallic foreign body (18×36 mm) piercing the anterior maxillary sinus wall and abutting the left nasolacrimal duct near the infraorbital canal. To address severe patient anxiety regarding permanent facial scarring and socioeconomic constraints, a minimally invasive, scarless intraoral surgical approach via the upper labial vestibule was executed under local anesthesia. The object was successfully retrieved. Postoperative transient neuropraxia resolved progressively during subsequent follow-up evaluations. **Conclusion:** This case highlights the critical need for immediate advanced radiologic imaging in minimal puncture wounds involving high-velocity impact mechanisms. Minimally invasive intraoral approaches offer an effective, scarless, and cost-efficient alternative to functional endoscopic sinus surgery (FESS) or standard external transcuteaneous incisions under local anesthesia.

KEYWORDS

INTRODUCTION

Penetrating maxillofacial trauma from occupational or industrial activities presents an anatomical and diagnostic challenge. A critical aspect of these injuries is that high-velocity fragments can penetrate deeply into facial tissues through minor, deceptively benign entry wounds, causing them to be easily overlooked during primary emergency evaluations[1]. Statistically, approximately one-third of all deep facial foreign bodies are entirely missed during initial visual triage[2].

If left undiagnosed or untreated, retained fragments lodged within the paranasal sinuses act as immediate vectors for virulent pathogenetic tracking. This risk is acutely elevated in patients with systemic comorbidities like diabetes, where contamination from agricultural or industrial environments can induce chronic purulent tracts, secondary acute or chronic sinusitis, and progressive osteomyelitis. Furthermore, the maxillary sinus shares delicate structural margins with the orbit and neurovascular corridors, meaning displaced projectiles demand rapid structural mapping and urgent surgical retrieval to prevent irreversible ophthalmic or neurologic impairment.

Case Presentation

Patient Information

A 41-year-old male lawn maintenance supervisor with a history of well-controlled type II diabetes presented to the emergency department immediately following an acute occupational accident. The patient had been struck in the face by a high-velocity metal fragment after a motorized brush cutter blade fractured upon striking a hard surface.

Clinical Findings

Upon initial physical assessment, the patient was hemodynamically stable, conscious, and oriented. Maxillofacial examination revealed a minute, superficial puncture-laceration wound measuring approximately 2×1 mm located in the left cheek region, immediately lateral to the left ala of the nose. A mild, superficial abrasion was noted over the adjacent nasal ala. There was no active hemorrhage, epistaxis, or associated visual or ocular deficit. Intraoral mucosal examination was completely unremarkable.

Diagnostic Assessment

Given the high-velocity mechanism of injury, a conventional lateral maxillofacial radiograph was ordered, which demonstrated a distinct

radio-opaque foreign body. A subsequent computed tomography (CT) scan of the facial bones was performed to establish exact three-dimensional spatial coordinates and evaluate for contiguous structural fractures.

The CT scan revealed a linear, metallic-density foreign body measuring approximately 18×36 mm originating within the premaxillary subcutaneous plane. The projectile had completely pierced the anterior wall of the left maxillary sinus, entering the sinus cavity with its proximal tip directly abutting the left nasolacrimal duct in close proximity to the infraorbital canal. No contiguous facial bone or orbital fractures were identified.

Therapeutic Interventions

Surgical removal was deemed urgent due to the elevated risk of virulent pathogenetic tracking from rust, soil, and organic lawn debris, which was heavily compounded by the patient's diabetic status. Two primary surgical interventions were discussed with the patient:

- Retrieval via Functional Endoscopic Sinus Surgery (FESS) under general anesthesia.
- Direct transcuteaneous exploration through the existing cheek puncture wound, which required extending the incision under local anesthesia.

The patient declined FESS due to severe financial and socioeconomic constraints and rejected transcuteaneous exploration due to high anxiety regarding permanent facial scarring. Consequently, an alternative, minimally invasive intraoral technique through the upper labial vestibule was planned to access the sinus under local anesthesia, to which the patient consented.

The patient was transferred to the minor operating theater. The extraoral puncture wound was thoroughly debrided, and the intraoral cavity was prepared using a standard betadine-saline irrigation sequence. Local anesthesia was achieved via a left infraorbital nerve block and a nasopalatine nerve block using 2% lignocaine with 1:80,000 adrenaline. A 2 cm horizontal mucosal incision was made in the vestibular region superior to the left canine and first premolar. A full-thickness mucoperiosteal flap was carefully elevated to expose the anterior wall of the maxillary sinus, revealing the impacted tip of the metallic object.

To facilitate safe mobilization without fracturing the surrounding bone

or displacing the object further, a micro-motor handpiece was used under copious saline irrigation to trim a minimal border of bone inferior to the object. Once mobile, the metallic fragment was successfully retrieved using a curved hemostat. The sinus cavity was then irrigated thoroughly with normal saline. A postoperative orthopantomogram (OPG) confirmed complete removal of the foreign body. Layered wound closure was achieved using 3-0 absorbable Vicryl sutures.

Postoperative Course, Follow-up, and Outcomes

The patient was discharged on a 7-day therapeutic regimen consisting of oral antibiotics (amoxicillin-clavulanate, 1 g twice daily), analgesics (diclofenac, 50 mg as needed), oral antihistamines, saline nebulization, and gastric protection (pantoprazole, 40 mg daily).

On postoperative day 7, clinical review demonstrated satisfactory mucosal healing, and the sutures were removed. The patient exhibited mild edema over the left cheek and complained of subjective paresthesia and numbness spanning the left cheek, upper lip, and lateral aspect of the nose. A supportive multivitamin regimen (Neurobion Forte) was initiated.

By postoperative day 14, the localized soft tissue swelling had fully subsided. The neurosensory paresthesia was resolving progressively, with residual mild numbness restricted solely to the upper lip. The patient was instructed to continue supportive care and remains under routine maxillofacial follow-up with excellent aesthetic results.

DISCUSSION

The management of foreign bodies lodged within the paranasal cavities depends heavily on exact spatial coordinate mapping. High-resolution computed tomography (CT) remains the gold standard to evaluate structural integrity and determine the orientation of deeply embedded objects relative to adjacent neurovascular bundles[4]. Once localized, open transcutaneous retrieval through the original traumatic laceration is often considered; however, widening an active wound in the aesthetic zone of the face risks severe long-term scarring, compromised aesthetics, and subsequent psychological distress for the patient.

Modern surgical trends often favor Functional Endoscopic Sinus Surgery (FESS) to manage sinus impactions due to its superior endonasal visualization and rapid recovery phase[5]. However, FESS requires general anesthesia and expensive, specialized instrumentation that may present insurmountable socioeconomic or financial barriers for patients. This case illustrates that a minimally invasive intraoral vestibular approach combined with a localized bony window serves as an effective, highly accessible alternative[7]. This method grants wide surgical visualization of the anterior maxillary sinus wall and allows complex object manipulation under local nerve blocks, completely avoiding permanent facial scarring[8].

Executing a conservative bone trim using a micro-motor handpiece facilitates the mobilization of large or irregular metallic projectiles without disrupting massive segments of the surrounding skeletal matrix[3,6]. Clinicians must, however, remain vigilant regarding potential postoperative neuropraxia. Physical manipulation in close proximity to the infraorbital canal can temporarily irritate adjacent branches of the infraorbital or alveolar nerves, presenting as transient neurosensory paresthesia or numbness that typically resolves progressively with supportive care.

CONCLUSION

This case demonstrates that even tiny, seemingly insignificant facial puncture wounds can harbor large, deeply embedded foreign bodies if the mechanism involves high-velocity impacts. Immediate advanced radiologic mapping is mandatory in these scenarios. When treating injuries in the aesthetic zone of the face, clinicians should prioritize scarless or minimally invasive intraoral approaches to optimize patient compliance, reduce financial barriers, and protect long-term psychological wellbeing.

Statements & Declarations

Patient Consent

Informed written consent was obtained from the patient for the publication of this case report and any accompanying de-identified imaging data.

FIGURES



FIGURE 1 - PRE OP IMAGE , SHOWING EXTRAORAL PUNCTURE WOUND OVER LEFT CHEEK REGION



FIGURE 2 – PREOP RADIOGRAPH SHOWING FOREIGN BODY IN RELATION TO MAXILLARY SINUS



FIGURE 3 – INTRAORAL INCISION AND IDENTIFICATION OF FOREIGN BODY , REMOVED FOREIGN BODY OF DIMENSION 1.5 CM

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