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Infraorbital Space Infection Secondary to Presence of Foreign Body- Case Report

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Abstract: Infraorbital space infections are rare but potentially severe complications arising from foreign body impalement in the maxillofacial region. This case report details a 52-year-old male presenting with left facial pain and swelling following a fall onto dry plant twig. The initial examination revealed diffuse swelling, erythema, and active pus drainage in the left infraorbital region. Despite preliminary care, the patient's symptoms persisted, leading to further investigation. A Cone Beam Computed Tomography (CBCT) scan revealed subcutaneous edema and hematoma, but did not initially identify the foreign body. Upon debridement, a 6 cm wooden particle was discovered and removed under local anesthesia. The patient was treated with intravenous antibiotics, analgesics, and corticosteroids, and showed significant improvement post-operatively. The culture and sensitivity testing of the pus drained revealed no bacterial growth, and the patient was discharged with a course of oral antibiotics. Follow-up demonstrated complete resolution of the infection, with satisfactory wound healing. This case underscores the diagnostic challenges posed by organic foreign bodies, which may not be readily visible on imaging studies. The importance of thorough clinical examination, patient history, and appropriate imaging techniques is emphasized to prevent misdiagnosis and complications. The management of such injuries requires a multidisciplinary approach, including meticulous surgical debridement and adequate antibiotic coverage to ensure optimal outcomes. This case also highlights the necessity for heightened awareness and caution in cases of facial trauma, even when initial imaging does not suggest the presence of a foreign body.

Keywords: Infraorbital space infection, Foreign body impalement, Maxillofacialtrauma, Woodenparticle, Cone Beam Computed Tomography (CBCT), Facial swelling Pus drainage, Surgical debridement, Antibiotic therapy, Multidisciplinary management

Introduction:

Maxillofacial surgeons frequently deal with foreign entities, which can be challenging to diagnose because of their size, accessibility, and anatomical proximity to several important tissues.(1,2).When treating these injuries, the right strategy calls for the involvement of a multidisciplinary team, appropriate sequencing, and the application of sufficient treatments and techniques that yield a satisfying outcome.(3)

When accidents result in lacerations and open wounds, a variety of things can pierce delicate tissues. If foreign bodies are not found and removed from the soft tissues after impacting the maxillofacial region, these objects like , bottle glass, a windshield, or even the sand grits, might impede the healing process.There are examples in the literature of wood splinters piercing the eye, other examples include impacted knife fragments, metal hardware etc.

In the maxillofacial area, impalement wounds are somewhat uncommon.(7) Vascular damage and uncontrollably bleeding are two reasons why this kind of injury can result in the patient's death. Bleeding can obstruct the airways when there is no contact between the wound and the nasal or oral cavities.(1,7)
A case of an infraorbital space infection caused by a foreign particle is shown and discussed in this work. The foreign object was removed under local anesthesia.

Case Report:

A 52 year old male patient reported to the department with a chief complaint of pain and swelling on left side of his face since 9 days. History revealed that the patient was apparently normal 9 days ago and gives alleged history of self fall in the backyard of his house and sustained injuries to the face. Patient also revealed that he fell on a tomato plant twig and attempted removal of it from the injury site. Preliminary care was done in the form of debridement of the multiple lacerations on the left side of the face along with the administration of tetanus booster vaccine and prescription of antibiotics and analgesics. A CBCT of head and neck region was adviced before referring the patient to department of oral and maxillofacial surgery, Rajarajeswari dental college, Bangalore.

Examination:

On examination mild facial asymmetry was noted in relation to left middle third of the face. A diffuse swelling measuring about 4x4cm was noted in relation to left cheek region extending superioinferiorly about 0.5cm from the infraorbital rim to 1cm below the alatragal line and about 0.5cm from the lateral border of nose till a point 3cm ahead of the tragus anteroposteriorly. (Figure-1)Multiple lacerations were noted on left infraorbital region, around malar prominence and in superiolabial region. Active pus drainage was noted with respect to the infraorbital and superiolabiallacerations .

Erythema was noted around the swelling with the skin appearing to be stretched along with encrusting of skin . Chemosis was noted i.r.t left eye.(Figure-2)

Figure-1

Figure -2

On palpation all inspectory findings were confirmed, and the swelling was tender, soft in consistency, associated with active pus and blood drainage along with local raise in temperature. Intraoral examination revealed inflamed gingiva around upper and lower anterior teeth region. Generalized attrition was noted along with staining on multiple teeth. 26 was missing and grossly decayed 45,46 was noted. (Figure-3)

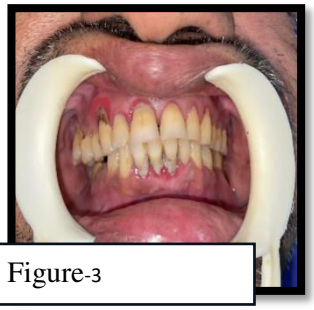

Figure-3

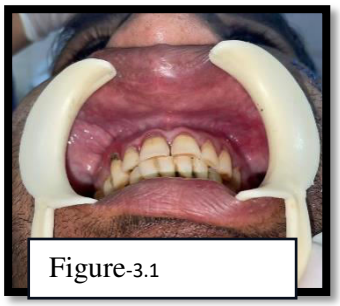

Figure-3.1

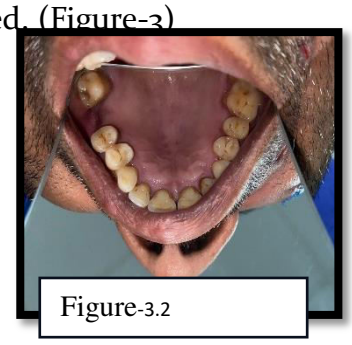

Figure-3.2

Based on the chief complaint, and clinical examination, a provisional diagnosis of left infraorbital space infection secondary to presence of foreign body was given. PA view and lateral view of skull brought by the patient were evaluated but dint reveal the

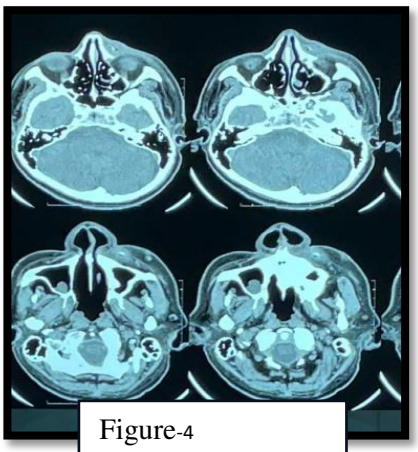

Figure-4

presence of foreign body or any associated fractures.

CBCT reported left periorbital and left cheek subcutaneous edema with hematoma and emphysema, with no mentioning of the possible etiology behind the same. However after thorough debridement of the infraorbital laceration the foreign particle was found to be a wooden piece.(Figure-4)

Figure-5

Figure-5.1

After administering the infraorbital block, exploration was done i.r.t left infraorbital region , pus was drained and sent for culture and sensitivity testing. Further exploration was done using a haemostat and the retrival of wooden particle was carried out. The retrieved wooden object was measuring about 6cm in length. After removal of the object the site was irrigated with copious amount of saline to flush out the remaining portions of the wooden particle.(Figure-5)

Figure-6

Figure -6.1

Figure-6.2

The patient was admitted on the same day and IV antibiotics(Taxim 1g, Metrogyl 100ml) and analgesics (injNeomol 100ml) along with dexamethasone 8mg was administered. The patient was asked to report to the department the next day for the follow up, after irrigation with saline and further exploration of the injured site few more residual

wooden particles were retrieved. (Figure-6)The laceration i.r.t left malar region was sutured using 5-0 prolene followed by wound dressing. (Figure-7)The patient was continued on the previously mentioned antibiotic therapy while the culture-sensitivity report of the pus sample was awaited.

Post 48 hours culture report showed no growth after aerobic incubation. Many pus cells were seen along with gram positive cocci clusters. Hence the patient was continued on the same antibiotics for another 3days. The chemosis of left eye was also addressed during the hospital stay and eye drops containing antibiotics(moxifloxin and to

Figure-7

Figure -7.1

Figure-7.2

bramycin)were used at 2 hours interval for about 6 times a day.
The patient was discharged after 3 days and was continued on oral antibiotics and analgesics for 5 days . On 1 week follow up, the patient showed significant improvement and complete resolution of the infection. Suture removal was also done and the wound healing was satisfactory.(Figure-8)

Figure-8

Figure-8.1

Discussion:

It is difficult to treat maxillofacial injuries caused by orofacial infections. To proceed with the treatment plan, the patient's history, physical examination, and a few radiologic diagnostics are insufficient. Impalement injuries affect body portions that contain a foreign body entirely or in part. For the patient, such injuries typically have disastrous outcomes. Case reports of these types of facial wounds, however, typically detail less severe injuries.(7,9–12) People frequently have defensive reflexes that help prevent things from entering their faces. Furthermore, compared to the trunk and limbs, the face has a lesser surface area. Because the face and skull have strong anatomic pillars and air spaces, their structure is capable of absorbing shock.(9,12)

When there is an impalement injury in the craniofacial region, it is referred to as Jael syndrome.(13) This phrase originates from the biblical account of Jael killing Sisera (Book of Judges IV:21). Jefferson (1968) is credited as being the first to describe this illness. In that report, a 16-year-old male patient had a severe accidental wound in the temporal region.(14) Wounds resulting from impalement in the craniofacial area are comparatively uncommon, and instances where the object sustains an impact are very uncommon.(7) Vascular injuries and uncontrollable bleeding might result in this kind of injury, which can cause death of the patient. Bleeding can clog the airways when there is no contact between the wound and the nasal or oral cavities.(1,7)
Three horizontal anatomic zones are susceptible to impalement injuries. Zone III is situated between the base of the skull and the mandibular angle. The distal section of the internal carotid artery, the vertebral artery, branches of the external carotid artery, salivary glands, the pharynx, spinal cords, and cranial nerves close to the base of the skull are among the significant structures in this area.(1) An angiography is necessary for any suspected damage in this area. It could be challenging to surgically expose this area and stop the bleeding there. An interventional radiology specialist typically treats vascular abnormalities in this area (3,8)

Due to a poor diagnosis, the removal of minor foreign bodies is almost always done after many days. The surrounding wound anatomy is frequently altered by foreign bodies. This lawsuit may be impacted by gunfire or changed following a procedure that caused an iatrogenic harm.5. An additional challenge could come from the inflammatory reaction in the tissues surrounding the foreign substance.(9) A variety of tests are employed to identify foreign bodies and pinpoint their location. Conventional radiography, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound may be used, depending on the object's composition and location. Infection (such as tetanus, cellulites, gas gangrene), peripheral nerve injury, pseudoaneurysm, and synovitis are among the complications anticipated by impacted foreign bodies (12).(13)

Because conventional radiography is readily available and inexpensive, it is typically requested as the initial complementary evaluation. With detection rates for metallic foreign bodies ranging from 69% to 90%, X-rays can be helpful in identifying and localizing foreign materials in the orbital region. However, the use of x-rays for foreign bodies of an organic origin, such wood, is limited (0% to 15%).(17, 18) The position of the foreign body and its likely relationship to important structures should be ascertained by using two x-rays, namely the lateral and frontal ones.(8,19)

The radiographic technique known as xeroradiography uses charged selenium plates, and it has been described as being somewhat more sensitive than conventional radiography at identifying organic foreign bodies, such as wood.

The inability to detect small foreign bodies concealed by overlapping bone is one of the primary problems.(16) Two investigations have shown that on a CT scan, particles like wood that lack a pronounced radiopacity appear to have a density like that of a gas.(10,15) However, a CT scan's ability to detect the density of organic substances, like wood, is mainly dependent on the kind of wood and the moisture content of the particle in issue.(10,11, 14) Due to the absorption of liquids, dry wood can eventually become moist in the tissues and may thus be easier to view in subsequent examinations.(Pages 11 and 15) Compared to other methods, MRI offers the best visibility of soft tissues. The way protons behave in a magnetic field serves as the basis for this method. Therefore, materials with water content are better visualized than those with no water content(11)

The usage of radio navigation systems has been suggested in recent years. These methods facilitate the removal of foreign bodies from the craniofacial region quickly and minimally invasively. They are particularly useful when there is a risk to important anatomic structures or when prior attempts to remove the foreign body have failed.
Ultrasonography has shown to be sensitive and specific in its evaluation of impacted foreign bodies, and it has been thoroughly explored for this purpose.(11, 14–15) The enhanced echogenic acoustic shadow of wooden foreign entities is an easy way to identify them because of the significant acoustic contrast between wood and soft tissues. Consequently, echography has shown to be the most effective modality for locating wooden foreign bodies (15), particularly when the object is just slightly damaged and is not checked for gas or overlapping bone.(1, 14–15)

Although infraorbital or canine space infection is frequently a result of odontogenic aetiology, this instance was distinct because the space became infected as a result of the presence of wooden particles as a result of self-fall. The muscles levatorlabi superioris alaque nasi, levatorlabi superioris, and zygomaticus minor binds the

infraorbital region superiorly; the caninus muscle bound inferiorly; the orbicularis oris bounded anteriorly; the buccinators muscle bounded posteriorly; and the anterolateral surface of the maxilla bounded medially.(20)

Conclusion

Foreign object detection cannot be based just on imaging modalities; it must also be combined with the patient's history and a thorough clinical evaluation. A comprehensive extraoral and intraoral examination should be undertaken before deciding on the appropriate imaging modality for detecting the foreign object. The ultimate goal is to cure the local infection and prevent subsequent complications, as well as to remove the foreign object without causing any damage to adjacent vital structures. In these circumstances, meticulous site debridement is critical. Intravenous antibiotics and wound dressing should be administered in addition to the surgical procedure in case of clean contaminated wound. As a result, sequential, multidisciplinary care, accurate diagnostic investigations, and a thorough clinical assessment are critical to the successful treatment of patients with maxillofacial injuries.

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