

Le fort II fracture: Post workplace head injury

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ABSTRACT

We present a case of a 55-year-old male presenting to Emergency Department (ED) of a tertiary care hospital with complaints of nausea, vomiting and headache after head injury due to accidental trauma by hammer on his head while working on his job. There was history of loss of consciousness. He suffered forehead, nasal bridge and upper lip injuries. Eye movements and vision was normal bilaterally. X-ray and computed tomography (CT) of facial bones showed pterygoid plates, maxillary sinuses and orbital floors fracture bilaterally. CT head showed frontal contusion and hemorrhage. The diagnosis of Le fort II fracture was made, which was repaired surgically by oromaxillary facial surgery team and patient was discharged after one week of uneventful recovery. Our case is the first report of Le fort II fracture from Bahrain.

Keywords: Bahrain, Computed tomography, Facial bones, Le fort fracture, Trauma

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INTRODUCTION

Le fort fractures are blunt trauma related facial fractures involving specific pattern of facial bones injury [1]. They are divided into three categories depending upon the pattern of mid facial bones injury. Pterygoid process of sphenoid bones is typically involved in all Le fort fractures disrupting mid face intrinsic buttress mechanism [2, 3]. These fractures are classified further depending upon the involvement of zygomatic, nasal and maxillary bones [2, 3]. Blunt facial traumas due to motor vehicle collision, assault, falls or sports injury are the usual causes [4]. In our case, Le fort 2 fracture resulted from workplace related hammer injury.

CASE REPORT

A case of a 55-year-old male is presented here, who presented in Emergency Department of a tertiary care hospital with complaints of nausea, vomiting and headache after being hit accidentally by a hammer on his head while working at a construction site. He lost consciousness for a few seconds and was brought to ED within one hour of his injury. On examination, primary survey was intact with patent airway, normal bilateral air entry, blood pressure of 120/75 mmHg and heart rate of 86/minute. His GCS (Glasgow coma scale) was full. In secondary survey head shows hematoma of about five cm's in mid frontal area. Facial examination showed a

laceration of about three centimeters (cm's) over his nasal bridge and about four cm's laceration over his upper left lip extending over face. Eye movements were fine bilaterally with normal vision. There was tenderness in frontal and maxillary sinus areas bilaterally along with orbital margins tenderness. Jaw occlusion was abnormal for the patient with slight mobility felt upon anterior drawing of incisors. Mandible and ear examination was fine bilaterally. Cervical spine was non-tender with rest of the secondary survey being insignificant. Patient was treated immediately with analgesia, intravenous fluids, antibiotics and tetanus toxoid. Lacerations were sutured according to standard protocols. His full blood count, coagulation and electrolytes were normal. CT head, face and cervical spine were done. CT head showed bilateral frontal bone fractures with multiple bilateral hemorrhagic contusions, more on the left side (Figure 1). CT face showed fracture of pterygoid plates, anterior and postero-lateral maxillary sinuses with orbital floors fracture bilaterally, making this case as the first report of Le fort II fracture from Bahrain (Figures 2 and 3). Patient was referred to maxillo-facial team who conducted surgical fixation of Le fort II facial fractures. For cerebral contusions, neurosurgical team treated patient conservatively and patient was discharged after one week of uneventful recovery.

DISCUSSION

Surgeon Rene Le fort, in 1901, introduced mid facial fractures classification after studying cadaver facial crush injuries. He experimented by applying blunt force of varying magnitude at different angles on cadaver heads and discovered predictable nature of mid facial fractures [1, 2]. He observed that all mid facial fractures are horizontal, pyramidal or transverse and labeled them as Le fort I (horizontal), Le fort II (pyramidal) and Le fort III (transverse) (Figure 4A) [1]. About 15% of facial

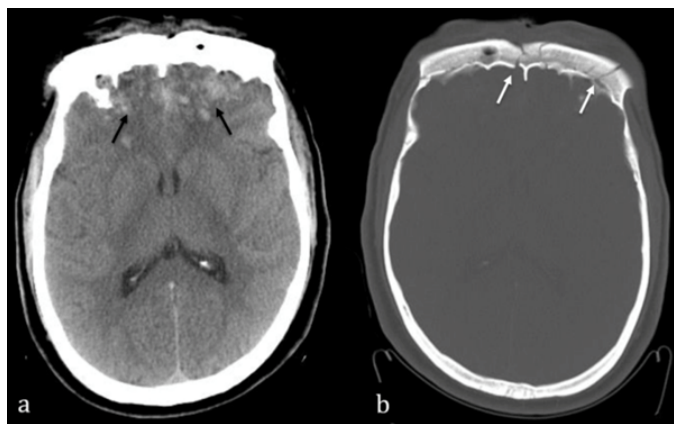


Figure 1: CT scan of brain soft tissue and bone windows showing bilateral frontal bone fractures with multiple bilateral hemorrhagic contusions, more on the left side. There is edema in frontal lobes with mass effect on frontal horns of both lateral ventricles.

fractures fall into the category of Le fort fractures [3]. A reasonable amount of force is required to produce such fracture. The common causes of Le fort fracture include motor vehical collisions and fall [4–7]. Axial loading of the head is very unusual and never reported to cause this type of injury, as in this case. In Le fort I, fracture line runs horizontally (transverse) across maxillae (tranmaxillary plant) above the upper dentine line. Also involves pterygoid process of sphenoid bone (Figure 4A,B-I) [2, 3]. In Le fort II the fracture line is pyramid shaped running down from bridge of the nose, bilaterally across lachrymal bones, orbital rims and

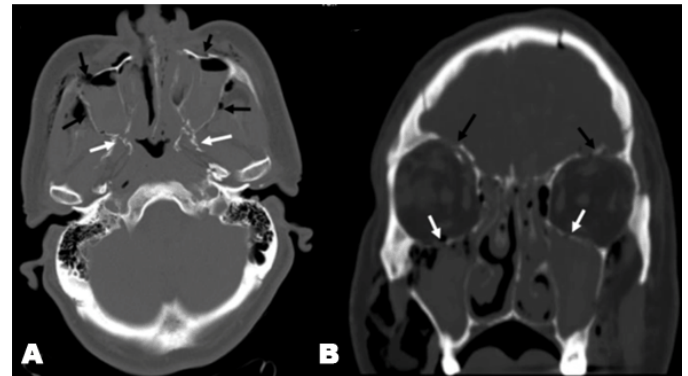


Figure 2: CT scan of facial bones axial view (A) showing fracture of bilateral pterygoid plates [white arrows] anterior and postero-lateral walls of maxillary sinuses [black arrows]. Coronal image (B) shows bilateral orbital floor fractures [white arrows] and orbital roof fractures [black arrows]

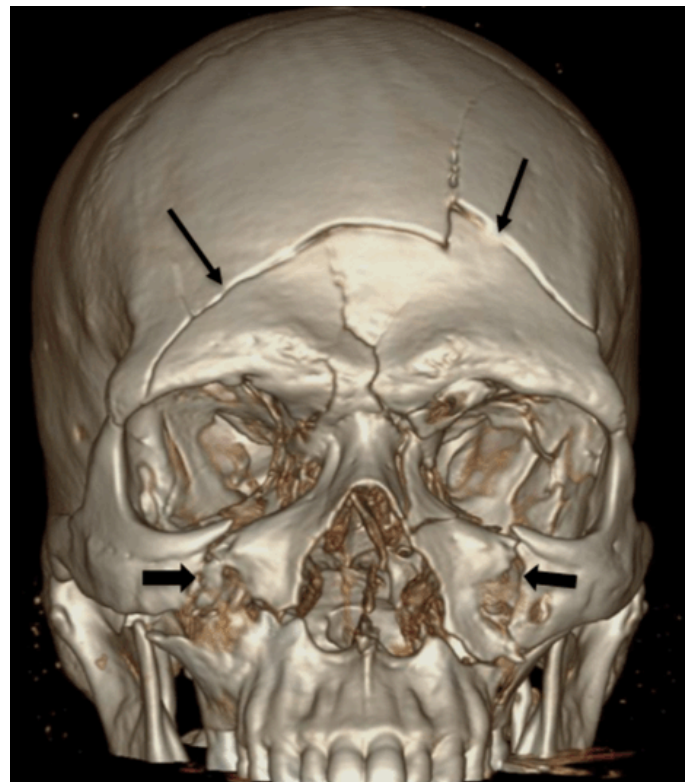


Figure 3: 3D CT scan of facial bones coronal view showing fractures of frontal bones (long black arrows), orbital roofs, orbital floors, maxillary sinuses (short black arrows), nasal septum and nasal bridge.

floors reaching up to maxillae (Figure 4A,B-II) [2, 3]. Le fort III fracture is rare and is basically a separation of skull and facial bones [8]. In this type, the fracture line runs posteriorly and laterally from the bridge of nose towards zygomatic arch passing through medial and lateral orbital walls on both sides, usually associated with cerebrospinal fluid leak (Figure 4A, B-III) [2]. All Le fort injuries are associated with pterygoid process fracture [9, 10]. Inferior orbital rim injury is characteristic of Le fort II fracture. Such injury is best recognized with 3D (3 dimensional) CT scan coronal view of face, as in our case [9]. The usual symptoms are pain in affected area with malocclusion. Signs include tenderness along fracture lines, with or without hematoma. Mid face can be drawn forward upon pulling incisors, especially in Le fort I and II. Limitation of eye movements can be present depending upon the extent of injury. If patient is stable simple facial X-ray, waters view (PA view of face with cephalad angulation) can be done initially looking for Dolan lines and elephants of Rogers (Figure 4C) [11–15]. However, CT scan of face especially with 3D construction is the investigation of choice.

The three lines, orbital (Figure 4C-1), zygomatic (Figure 4C-2) and maxillary (Figure 4C-3) lines on occipitontal skull radiograph are called Dolan's lines. The zygomatic and maxillary lines together form visual appearance resembling head of elephant called elephant's of Rogers [14].

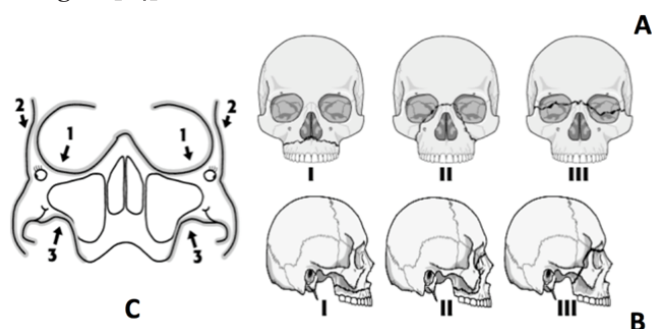


Figure 4: Le fort I, II and III fracture (A) anterior view (B) lateral view. (C) Lines of Dolans and elephants of Rogers [15].

CONCLUSION

Le fort II facial fracture is uncommon and should be suspected in frontal axial loading head injuries.

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Author Contributions

Ashraf Elshehry – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
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Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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