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

How to cite this article

Elshehry A, Khilji MF, Buhassan SS, Obaid A, Hamid RS. Le fort II fracture: Post workplace head injury. Int J Case Rep Images 2018;9:100962Z01AE2018. Article ID: 100962Z01AE2018

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 fracture 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 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 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 vehicular 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 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.

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 occipitomental 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].

CONCLUSION

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

REFERENCES

1. Le fort R. Étude expérimentale sur les fractures de la machoire supérieure. Revue chir de Paris 1901;23:208–27, 360–79, 479–507.
2. Kühnel TS, Reichert TE. Trauma of the midface. GMS Curr Top Otorhinolaryngol Head Neck Surg 2015 Dec 22;14:Doc06.
3. Akoglu E, Onur O, Denizbasi A, Kosargelir M, Akoglu H, Ibrahim A. Headling the ball: A case of a Le fort II fracture in a football match. BMJ Case Rep 2011 Mar 15;2011.
4. Arslan ED, Solakoglu AG, Komut E, et al. Assessment of maxillofacial trauma in emergency department. World J Emerg Surg 2014 Jan 31:9(1):13.
5. Kretlow JD, McKnight AJ, Izaddoost SA. Facial soft tissue trauma. Semin Plast Surg 2010 Nov;24(4):348–56.
6. Motamedi MH. An assessment of maxillofacial fractures: A 5-year study of 237 patients. J Oral Maxillofac Surg 2003 Jan;61(1):61–4.
7. Gonzalez E, Pedemonte C, Vargas I, et al. Facial fractures in a reference center for level I traumas: Descriptive study. Rev Esp Cir Oral Maxilofac 2015;37(2):65–70.
8. Bell RB, Dierks EJ, Homer L, Potter BE. Management of cerebrospinal fluid leak associated with cranio-maxillofacial trauma. J Oral Maxillofac Surg 2004 Jun;62(6):676–84.
9. Rhea JT, Novelline RA. How to simplify the CT diagnosis of Le fort fractures. AJR Am J Roentgenol 2005 May;184(5):1700–5.
10. Unger JD, Unger GF. Fractures of the pterygoid processes accompanying severe facial bone injury. Radiology 1971 Feb;98(2):311–6.
11. Goh SH, Low BY. Radiologic screening for midfacial fractures: A single 30-degree occipitomental view is enough. J Trauma 2002 Apr;52(4):688–92.
12. Sun JK, LeMay DR. Imaging of facial trauma. Neuroimaging Clin N Am 2002 May;12(2):295–309.
13. Pogrel MA, Podlesh SW, Goldman KE. Efficacy of a single occipitomental radiograph to screen for midfacial fractures. J Oral Maxillofac Surg 2000 Jan;58(1):24–6.
14. Dolan KD, Jacoby CO. Facial fractures. Semin Roentgenol 1978 Jan;13(1):37–51.
15. Facial and Mandibular Fractures. UW Radiology, University of Washington. [Available at: https://rad.washington.edu/about-us/academic-sections/musculoskeletal-radiology/teaching-materials/online-musculoskeletal-radiology-book/facial-and-mandibular-fractions]

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
Muhammad Faisal Khilji – 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
Sara Saad Buhassan – 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
Aladdin Obaid – 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

**********
it critically for important intellectual content, Final approval of the version to be published
Rana Shoaib Hamid – 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

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.

Copyright
© 2018 Ashraf Elshehry et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.
