Trauma Case Reports 39 (2022) 100648

Contents lists available at ScienceDirect

Trauma Case Reports

journal homepage: www.elsevier.com/locate/tcr

Case Report

Meat tenderizer assault and associated facial trauma: A case report[1]

Ryan Hudnall, Bailey Hassman, Katie Geelan-Hansen *

University of Nebraska Medical Center, Department of Otolaryngology-Head and Neck Surgery, 981225 Nebraska Medical Center, Omaha, NE 68198-1225, United States of America

ARTICLE INFO

Keywords:
Blunt facial trauma
Ocular injury
Zygomaticomaxillary complex fracture
Zygomatic fracture
Facial trauma
Zygomatic repair

ABSTRACT

Background: Blunt trauma to the face, head and neck is frequently encountered in violent assaults (Brink, 2009 [1]). There can be trauma to the cranium in high energy mechanisms, though interpersonal trauma is less likely to be associated with traumatic brain injury (TBI) (Salentijn et al., 2014 [2]).

Case report: We describe severe soft tissue facial trauma, ocular trauma, subdural and epidural hematomas as well as calvarial fractures, orbital floor and zygomaticomaxillary complex (ZMC) fracture following assault with a meat tenderizer. Due to the unique mechanism of trauma and the extent of injury including TBI coordination of care involved many teams. The patient was treated, then discharged to a skilled nursing facility with subsequent discharge to home. He has continued neurocognitive improvement but loss of vision in the left eye.

Conclusion: Violent trauma with a meat tenderizer can lead to significant soft tissue trauma, facial fractures, calvarial fractures and TBI.

Introduction

Facial anatomy is a complex association of multiple tissue types with connection to the central nervous system (CNS). Therefore, facial trauma has multifaceted elements to the type and degree of injuries. Traumatic soft tissue injuries are most commonly lacerations (41%), followed by excoriations, (24%) hematomas (24%) and contusions (11%) [3]. Orbital floor and zygoma fractures have been found to make up 45–55% of facial fractures [3,4]. The proximity to the CNS risks those with facial trauma to also have traumatic brain injury (TBI). However, TBI is less likely to be associated with interpersonal violence, while more related to MVA [2]. In general, patients with skull fractures are more at risk for TBI and intracranial hemorrhage [5]. There are varying reports of the risks of ocular injury in facial trauma, however zygomaticomaxillary complex fractures (ZMC) have been found to be the most frequently associated with blindness [6].

We present a patient with a unique mechanism of injury, assault with a meat tenderizer, with facial trauma that injuries include soft tissue including ocular and intracranial damage as well as calvarial fractures, ZMC fracture and orbital floor fracture.

* Corresponding author at: University of Nebraska Medical Center, Department of Otolaryngology-Head and Neck Surgery, 981225 Nebraska Medical Center, Omaha, NE 68198-1225, United States of America.

E-mail address: katie.geelanhansen@unmc.edu (K. Geelan-Hansen).

[1] Presented as an oral presentation at the University of Nebraska Otolaryngology-Head and Neck Surgery Annual Scary Case Conference, October 30, 2021.

https://doi.org/10.1016/j.tcr.2022.100648
Accepted 23 April 2022
Available online 27 April 2022

Case presentation

A 58-year-old male arrived by fire department to the Emergency Department with severe facial trauma after assault with a meat tenderizer. Patient was attacked in a home invasion, at least initially, while sleeping with continuous positive airway device (CPAP). At the scene, the patient had Glasgow Coma Scale (GCS) of 8 with presence of Cushing's triad (hypertension, bradypnea, bradycardia). Upon arrival to the ED, he was intubated and with findings of significant left facial swelling, periorbital edema, inability to open left eye, and a potentially open left globe (Fig. 1, consent form obtained from patient for use of facial photograph). A CT head revealed extensive fracturing of left calvarium, ZMC, and left orbit; left globe rupture, vitreous hemorrhage, and retrobulbar hematoma; and a small subdural/epidural bleed deep to squamous temporal bone fracture (Figs. 2, 3). Due to immediate concern for orbital compartment syndrome given proptosis on exam and retrobulbar hematoma on CT, lateral cantholysis and canthotomy of left eye was performed.

Ophthalmology urgently took the patient to the OR for orbital exploration and repair of a 15 mm scleral laceration posterior to lateral rectus insertion. He was also found to have hyphema, vitreous hemorrhage, and a traumatic cataract on exam.

The patient was admitted to the Surgical Intensive Care Unit. He was extubated hospital day (HD) 2. After extubation the patient was found to have global aphasia and altered mental status. MRI brain with and without contrast was consistent with axonal stretch injury in the left parietal lobe, bilateral frontal and left anterior temporal hemorrhagic contusions, left subdural hematoma, and scattered subarachnoid hemorrhage. No surgical intervention was completed by neurosurgery. Speech therapy, occupation therapy and physical therapy were consulted. He completed 7 days of seizure prophylaxis.

Patient underwent complex ZMC fracture repair by otolaryngology 9 days after presentation when he had stabilized. Complex ZMC fracture was repaired with open reduction and internal fixation (ORIF) via multiple approaches.

He was discharged to a skilled nursing facility on HD 17 with persistent yet improving aphasia. He had light perception vision on the left with noted vitreous hemorrhage and retinal detachment. Now 1 year post trauma he has very slight word finding difficulty with less language comprehension difficulty, left eye with light perception only but overall good facial and ocular cosmesis (Fig. 4, consent form obtained from patient for use of facial photograph). The patient has consented to d medical information and photography.

Fig. 1. Extent of traumatic injury on initial presentation.

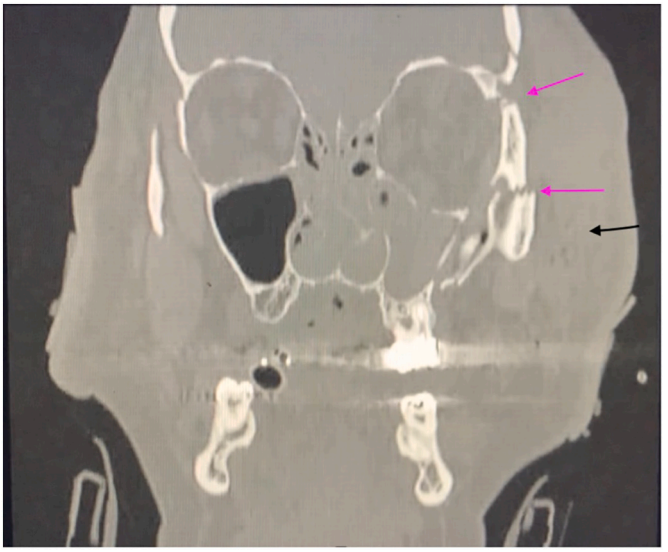

Fig. 2. CT Maxillofacial without contrast, coronal view. Extensive left zygomaticomaxillary complex and orbit fracturing (pink arrows) with significant soft tissue edema (black arrow). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

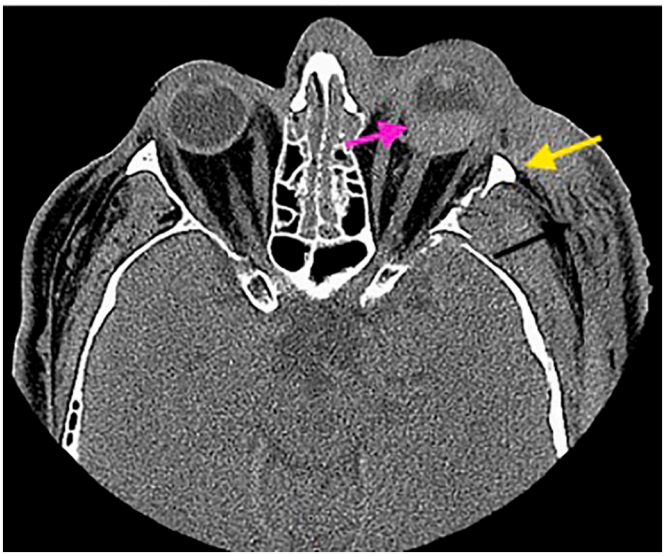

Fig. 3. CT Maxillofacial without contrast, axial view. Left orbital wall fracture (yellow arrow), globe rupture and vitreous hemorrhage (pink arrow), and significant soft tissue edema (black arrow). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Discussion

Facial trauma is most commonly caused by motor vehicle accidents (MVA), assaults, falls, work or sport related accidents and most commonly occurs in males between ages 20–39 years [1–3]. In violent assaults, 65% of injuries involved the head, neck, and face. Interpersonal violence is the least likely to be associated with traumatic brain injury [2]. This is a unique case due to the combination of blunt force as well as a penetrating action of a meat tenderizer that resulted in soft tissue, bony fractures, globe rupture and TBI.

Complications from TBI are inversely related to the GCS of patients [7]. The patient here presented with a GCS 8, no surgical intervention was completed by neurosurgery. The location of the brain injury was consistent with injury of the language centers of the brain, the left parietal lobe, left frontal cortex and left temporal lobe resulting in global aphasia. Cognitive communication is a more common communication deficit in TBI than aphasia [8]. Our patient had global aphasia with progressive improvement in his speech and comprehension but with slight persistent word finding difficulties more than comprehension difficulties at 1 year post trauma.

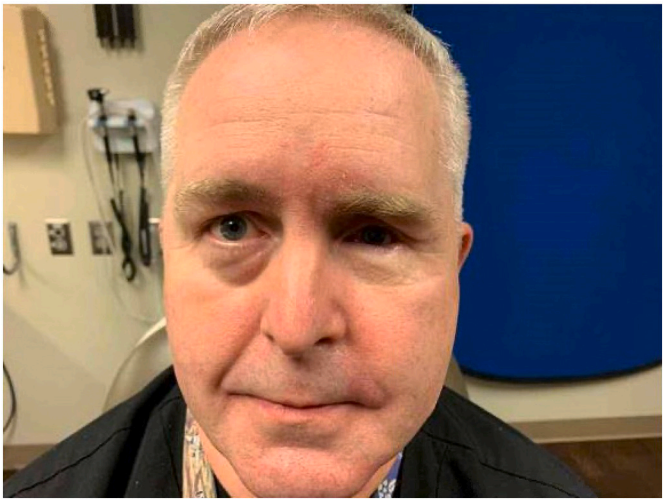

Fig. 4. Degree of recovery at 1-year postoperative follow-up.

There is improvement in discourse at 1 year in patients with TBI, but TBI patients remain significantly below age matched controls in their cognitive communication [8]. In addition, speech and language recovery research indicate the greater the preinjury years of education and the shorter duration of the post-traumatic amnesia were related to improved recovery though patients with aphasia can vary in recovery from those without aphasia [8]. Speech and language interventions are an important part of the recovery for TBI patients [8].

Open globe ocular injuries result in a 12–23% risk of evisceration/enucleation or no light perception [9]. A open globe injury with posterior extension is a poor prognostic indicator of post trauma visual acuity [9]. There is a 33% risk of retinal detachment in patients with open globe injury, there is often a vitreous hemorrhage that accompanies the retinal detachment in these patients [9]. This patient sustained globe rupture, vitreous hemorrhage, retinal detachment and traumatic cataract, so the resulting light perception only vision is not an alarming result given the extent of damage.

Conclusion

This case of facial trauma cause by a meat tenderizer highlights a unique mechanism of action in trauma and reveals possible resulting injuries.

References

[1] O. Brink, When violence strikes the head, neck, and face, J. Trauma 67 (1) (2009) 147–151.
[2] E.G. Salentijn, S.M. Peerdeman, P. Boffano, B. van den Bergh, T. Forouzanfar, A ten-year analysis of the traumatic maxillofacial and brain injury patient in Amsterdam: incidence and aetiology, J. Cranio-Maxillofac. Surg. 42 (2014) 705–710.
[3] R. Gassner, T. Tuli, O. Hachl, A. Rudisch, H. Ulmer, Cranio-maxillofacial trauma: a 10 year review of 9543 cases with 21 067 injuries, J. Cranio-Maxillofac.Surg. 31 (1) (2003) 51–61.
[4] M. Scherer, W. Sullivan, D.J. Smith, L.G. Phillips, M.C. Robson, An analysis of 1423 facial fractures in 788 patients at an urban trauma center, J. Trauma 29 (3) (1989) 388–390.
[5] J. Puljula, H. Cygnel, E. Makinen, et al., Mild traumatic brain injury diagnosis frequently remains unrecorded in subjects with craniofacial fractures, Injury 43 (2012) 2100–2104.
[6] M. Magarakis, G. Mundinger, J. Kelamis, A. Dorafshar, B. Bojovic, E. Rodriguez, Ocular injury, visual impairment, and blindness associated with facial fractures: a systematic literature review, Plast. Reconstr. Surg. 129 (1) (2012) 227–233.
[7] E.Z. Goh, N. Beech, N.R. Johnson, Traumatic maxillofacial and brain injuries: a systematic review, Int. J. Oral Maxillofac. Surg. 50 (2021) 1027–1033.
[8] E. Elbourn, B. Kenny, E. Power, et al., Discourse recovery after severe traumatic brain injury: exploring the first year, Brain Inj. 33 (2) (2019) 143–159.
[9] H. Lin, G. Lema, P. Yoganathan, Prognostic indicators of visual acuity after open globe injury and retinal detachment repair, Retina 36 (4) (2016) 750–757.