

**Case Report****Intraoral bull horn injury**

Rodrigo Licéaga \*, Ilan Vinitzky

Department of Oral and Maxillofacial Surgery, Juarez Hospital, Mexico City, Mexico.

\* Corresponding author: r\_liceaga@hotmail.com

Revised edition: 08/09/2014. Accepted: 08/09/2014. Published online: 19/11/2014.

**Abstract** This case report aimed to illustrate an intraoral bull horn injury in a 52-year-old patient, explain the mechanism of injury, and review bull horn injuries and their treatment.

**Keywords:** intraoral bull horn injury.

**Introduction**

In Latin American culture, festivities frequently involve animals. Such traditions include bull fighting, and injuries from the horn of a bull are a common occurrence. In addition to the traditional shows and events, popular festivities (where alcohol is generally consumed) involve the interaction of the audience with the animals (Vázquez Bayod *et al.*, 2000). The injuries that can result have certain characteristics that make them different from other injuries (Brandenberg and Archer, 2005). These injuries from animals are rarely serious, and they have few complications; the death rate is lower than 1% (Miralles-Tena *et al.*, 2006). They occur most frequently in the lower extremities, abdomen, perineum, thorax, upper extremities, head, neck, and back (Campos-Mollo *et al.*, 2007). Although these types of injuries are most common among bullfighters, they are also found among persons who handle the animals, such as cattle owners, veterinarians, and the personnel who care for the animals (Wasadikar *et al.*, 1997; Smith, 2001). Almost all such injuries (more than 98%) occur in men (Casani-Martinez and Morales-Suárez-Varela, 2000).

**Mechanism of injury**

When a bull initiates its attack, the animal bends and expands its neck in order to attack with either one or both horns. As a result of the upward movement of the bull's head, the first thrust is ascending. If the movement continues and the bull moves its neck, it is able to lift its victim several centimetres from the ground. At this moment, a bullfighter is dependent on the animal. The horn will act as an axis and will turn, moving the victim in such a way that in general the head of the person will start to descend at the moment that their legs are raised. Thus, new injuries are produced, which can cause severe harm to several organs or areas of the body.

This phenomenon explains why the most common location of injury is the lower extremities; however, as a consequence of the first injury and the lifting movement, damage can be done to any part of the body. According to the literature, in general such injuries affect only the skin, subcutaneous tissues, and the muscular layer. Reports of fractures are infrequent, which is why the majority of these cases require only local anaesthesia (Ríos Pacheco *et al.*, 2003; Franchitto *et al.*, 2007).

After asepsis and anaesthesia, it is very important to explore the injury thoroughly, to evaluate the possibility of complications from the original injury. This is the most opportune moment to clean the injury and remove foreign bodies, such as splinters from the horn, stones, and soil. It is important to wash the wound profusely with a physiological solution and an antiseptic solution such as povidone iodine (Lehmann, 2005). In cases of oral injury, chlorhexidine is indicated.

In general, injuries are described as mild, although they can require complex corrective procedures, such as microvascular surgery, lung and intestinal resections, gastric surgery, or tracheostomy (Saravanapavanathan, 1982; Chambres *et al.*, 2003). All injuries from bull horns should be considered to be contaminated, and preventive action should be taken to avoid severe infections (Idikula, 1991).

Bull horn injuries contain different types of ecosystems, such as the normal environment of the anatomical region affected by the horn and the habitat in which the injury is present. This exposes the injured area to infections involving Gram-positive cocci, Gram-negative bacteria, anaerobic agents, and others.

The most common microorganisms that are found in these injuries include *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Clostridium perfringens*; as a consequence, pharmacological therapy is orientated towards these types of microorganism (Ara *et al.*, 2000). One option is to use a combination of penicillin and metronidazole. Alternatively, the use of a cephalosporin can give good results. In addition to the administration of antimicrobial drugs, anti-tetanus vaccine must be administered because of the potential transmission of *Clostridium tetani* (Abuabara, 2006).

### Case report

A 52-year-old male was admitted to the emergency room with a broad laceration of the upper lip and nasal and oral bleeding. The patient was a cattle breeder who fed and took care of his cattle

personally. Six hours before admission, while working in close proximity to one of his bulls, he had been attacked. While moving backwards, the bull had introduced one of its horns into the mouth of the patient and perforated the palate. As soon as the bull lowered its head, the horn was removed from the patient's mouth. The patient was conscious and cooperative. The bleeding from the laceration of the upper lip was controlled with compression. Intraoral examination revealed an injury at the centre of the roof of the mouth, at the junction of the hard and soft palates, which communicated with the nasal floor (Fig. 1).

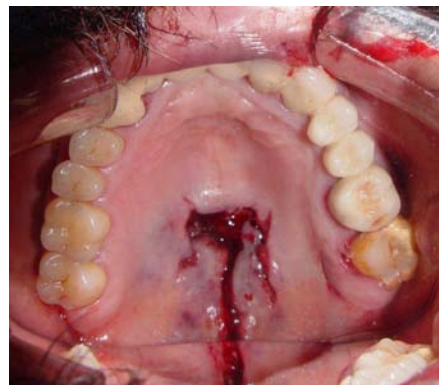


Fig. 1 Intraoral aspect of injury.



Fig. 2 Secondary closure with a double-layer technique.



Fig. 3 Final result.

Under local anaesthesia, exploration of the injury revealed that part of the palate was fractured and separated from the periosteum, which necessitated its removal. Primary closure was carried out, and the injury was treated routinely. During the healing process, a small oronasal fistula was noted. This was repaired by the use of a double-layer technique with direct closure towards the nasal floor (Fig 2). Closure of the palatal mucosa was accomplished with two releasing incisions in the molar and premolar areas. The process of healing was uneventful, and the case was resolved favourably (Fig. 3).

## Discussion

Although injuries from bull horns are common, reports in the literature are scarce. The reports tend to focus on statistics that summarize the incidents on the basis of the population or the type of intervention required (Downey, 2007). No previous report of an intraoral injury caused by a bull horn was found in the literature.

Considering the diameter of the palatal injury and the conical shape of the bull's horn, we can assume that no more than 4 cm of the length of the horn entered the palate of the patient. However, the horn caused, in addition to the mucosal injury, oronasal communication and fracture of the palate bone. It is unlikely that a patient could sustain an injury to the face from a bull horn and not suffer further consequences or evident injuries.

The treatment of oronasal communication can be challenging. In this case, primary closure was attempted with the use of the adjacent mucosa, with the aim of achieving definitive treatment. However the result was not as expected, and a residual oronasal fistula was observed. There are many reported techniques for the treatment of oronasal fistulas; the techniques vary depending on the location, shape, and size of the defect. The ideal repair involves a double-layer technique because this provides greater support and stability to the repair than a single-layer technique and reduces the risk of failure (Ogle Orrett, 2002). It would

perhaps have been appropriate to consider the use of this technique at the beginning, thus avoiding the need for two procedures.

Penetrating trauma to the oral cavity, especially in the region of the soft palate or oropharynx, can have devastating results because of possible harm to the adjacent vascular structures (Kalantar Motamedi, 2007). In the present case, a bull horn penetrated into the hard palate of the patient, and resulted in an oronasal fistula as the main sequel. The treatment of this condition had several objectives, which included the prevention of fluid leaks, separation of the cavities, prevention of the entry of any oral contents into the nasal fossae, and protection of the nose from the oral microflora (Raska *et al.*, 2007).

In the present case, these objectives were attained through a double closure technique, which provided the patient with an adequate aesthetic and functional outcome. As mentioned previously, injuries of the oral cavity by a bull horn are rare; hence, there is no established protocol for their management. Among the relevant factors to be considered in such cases are the mechanism of injury, the general state of the patient, the microorganisms present on the bull's horn, and the possibility of concomitant infection. We hope that this report of an unusual case with a satisfactory outcome will provide useful information for the management of similar cases.

## References

- Abuabara A. A review of facial injuries due to dog bites. *Med Oral Patol Oral Cir Bucal* 2006;11:348-50.
- Ara M, Seral C, Baselga C, Navarro M, Grasa M, Carapeto F. Primary tuberculous chancre caused by *Mycobacterium bovis* after goring with a bull's horn. *J Am Acad Dermatol* 2000;43:535-37.
- Brandenburg MA, Archer P. Mechanisms of head injury in bull riders with and without the Bull Tough helmet--a case series. *J Okla State Med Assoc* 2005;98:591-95.
- Campos-Mollo E, Pérez-Santonja JJ, Samper-Giménez J. Orbital penetrating wound by a bull horn. *Arch Soc Esp Oftalmol* 2007;82:645-48.
- Casani-Martinez C, Morales-Suárez-Varela M. Bull horn lesions in childhood. *Pediatrics* 2000;105:685-86.

- Chambres O, Giraud C, Gouffrant JM, Debry C., A detailed examination of injuries to the head and neck caused by bullfighting, and of their surgical treatment: the role of the cervico-facial surgeon. *Rev Laryngol Otol Rhinol* 2003;124:221-28.
- Downey DJ. Rodeo injuries and prevention. *Curr Sports Med Rep* 2007;6:328-32.
- Franchitto N, Gavarrí L, Zavaleta I, Telmon N, Rougé D. The anaesthetist's liability and bullfights. *Ann Fr Anesth Reanim* 2007;26:656-65.
- Idikula J, Moses BV, Sadhu D, Agarwal S, Jahan G, Thomas J. Bull horn injuries. *Surg Gynecol Obstet* 1991;172:220-22.
- Kalantar Motamedi MH. Primary treatment of penetrating injuries to the face. *J Oral Maxillofac Surg* 2007;65:1215-18.
- Lehmann V. Medical care of the bull fighters in Spain. *Hist Hosp* 2005;24:199-210.
- Miralles-Tena JM, Escrig-Sos J, Traver-Martínez G, Cisneros-Reig I, Salvador-Sanchís JL. Bull horn wounds in Castellon General Hospital. A study of 387 patients. *Cir Esp* 2006;80:16-22.
- Ogle Orrett E. The management of oronasal fistulas in the cleft palate patient. *Oral Maxillofac Surg Clin N Am* 14 (2002) 553-562
- Raska GM, Cordova SW, Lema R, Goldwasser MS. Management of penetrating trauma to the soft palate: a case report. *J Oral Maxillofac Surg* 2007;65:1279-85.
- Ríos Pacheco M, Pacheco Guzmán Rafael, Padrón Arredondo Guillermo. Heridas por asta de toro. Experiencia de un año en el Hospital General O`Horán. Mérida Yucatán. *Cir Ciruj* 2003;71:55-60
- Saravanapavananthan N. Penetrating wound of the aorta by a bull's horn. *Injury* 1982;13:412-13.
- Smith M. The psychology of the bull fight. *The Lancet* 2001;357:239.
- Vázquez Bayod R, Villanueva Saenz, Gómez García Emmanuel. Aspectos generales en el manejo quirúrgico de las heridas por asta de toro en el Valle de México 1997-2000. Reporte de 42 casos. *Rev Mex Ortop. Trauma* 2000;14(4):302-08.
- Wasadikar PP, Paunikar RG, Deshmukh SB. Bull horn injuries in rural India. *J Indian Med Assoc* 1997;95:3-4.