



## A RARE CASE OF BULL HORN INJURY TO CHEST WALL; FLAIL SEGMENT ON CHEST WALL WITHOUT ASSOCIATED RIB FRACTURES

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### ABSTRACT

Bull horn injuries are among the commonest accidents in rural India, where people make their living rearing the livestock. The injuries thus sustained include the direct penetrating injuries caused by horns of the animal and blunt injuries sustained like chest & spine injuries, long bone fractures. A thorough head to toe examination is therefore essential in evaluating such patients. Bullhorn injury on the chest wall comprises a wide spectrum covering minor abrasions to fatal lung injuries. We report a case of 7 year old boy who had a bullhorn injury on left chest wall with flail segment but interestingly there was no rib fracture. Child was treated by immediate tube thoracostomy and strapping of flail segment.

### INTRODUCTION

Bull horn injuries are commonly seen in rural areas but are less commonly seen in an urban setting [1, 2]. The Bull is normally a docile and easily domesticated animal, May sometimes become angry for no obvious reason [2, 3]. The commonest site of injury in bullhorn cases is the abdomen and perineal region [1-4]. The injuries predominantly occur on right side of abdomen [2, 4]. The reason for perineal involvement is its anatomical configuration leading horn hook to engage and penetrate [2]. The wounds produced are contusions, lacerations, penetration of body cavities and rarely fractures. Chest injuries sustained by bullhorn are contusions, lacerations of chest wall, fractures of ribs, clavicle, and sometimes thoracic spine. Lung parenchymal injuries result in surgical emphysema, pneumothorax, hemothorax, and pulmonary contusions. The maximum numbers of injuries are sustained in villagers while rearing the cows and bulls, during feeding, while tying them or milking the cows or buffaloes [2,5].

**CASE REPORT:** A 7 year old rural boy was hit on chest by a bull while going to school. He was brought to

emergency department with complaint of chest pain and a swelling over left chest wall that was bulging and flattening with every breath cycle [Figure 1,2]. On examination he was conscious, cooperative and vitally stable. There was tenderness on left lower chest wall with a swelling of size approximately 6 cm, spanning 6th and 7th intercostal spaces in anterior axillary line that was bulging out with expiration and sucking in with inspiration. There was 1cm abrasion over the swelling but no punctured wound. There was no surgical emphysema over the rest of the chest wall. Patient was mildly dyspneic. X ray chest [Figure 3] was done that showed left sided pneumothorax but no rib fracture. CT scan chest [fig.4] with bony 3D reconstruction [Figure 5,6] was done that showed left sided hemopneumothorax and a pocket of air in the chest wall. No rib fracture was noticed in the 3D reconstruction. Intercostal drainage tube of size 28 French was inserted in left posterior axillary line in 5th space that drained about 100ml of blood along with some air. No air leaking was noticed. The swelling was dressed and compressed with elastic adhesive dressing to strap it flat. Patient was discharged after 5 days after tube removal.



The swelling subsided after draining pneumothorax and didn't appear on discharge.

## DISCUSSION

The wounds produced due to bull horn impact vary from contusions, lacerations, and penetrating wounds involving internal organs to fractures [5-7].

In India, Bull gore injuries are frequently observed in villages but incidences related to deaths from bull gore are infrequently seen in Metropolitan cities. In some countries like Spain it's seen during bull fighting [8]. Goring is taken when the bull horn penetrates deeply in the muscles as well as body cavities [2,6]

Many times impact by the bull or other cattle involves the thoracic region of body. Atri and Mehdiratta[10] in an analysis of 154 civilian chest injuries reported six cases from bullhorns with three cases of right and left side each constituting about 4%. According to other researchers and the present study chest injuries are in the form of multiple rib fractures [3,9] and penetrating injuries involving lungs [7].

The injuries are seen more commonly seen involving the abdomen and the perineum [1-4,6-9]. In the abdomen, the horn first tears the subcutaneous tissues and later muscles and further if the violence is more, the peritoneum is punctured [2,5]. Since the head of bull is at the same level as victim's abdomen, this part of body is most exposed to the attack [2,3]. The reason appears to be lack of bony shield over the abdomen permitting the horn hook to engage and penetrate.[4] In the bullring, the bullfighters most commonly sustain injuries on the abdomen [11]. These injuries can be in the form of perforations of abdominal wall, and internally hemorrhages and perforations involving mesentery and bowels [1,9]. Visceral injuries involving spleen and more frequently

liver being situated on right region of body are commonly encountered. Among the perineal injuries anovaginal fistula [5] urethrorectal fistula [12] injuries to anal canal and posterior vaginal wall has been caused by bullhorn.

In all the above-mentioned studies, the larger frequency of injuries is located on right side. The obvious explanation could be that the victim sustained injuries while rearing the animal, during feeding, tying to the poles, putting ropes round the neck and tying to the bullock-cart. During these manoeuvres, the right side of body is exposed to the tip of the horn when the animal suddenly moves its head. Moreover, most of the people are right handed and the animal stands on the right side and hence the tip or body of the horn is in close association with the right side of the body. Other possible explanation could be that the victim may turn the right side of the body towards the animal protecting himself by using right arm in self-defense [3,4].

In our case the injury was on the chest wall, in contrast to the commonly injured abdomen. The obvious explanation is that the patient is a child so the chest wall is at the level of the head of the cattle. The side involved was left side in contrary to commonly involved right side.

Now the interesting fact in our case is that the lung was injured as there was hemopneumothorax, but there was no rib fracture. In addition the air pocket that was made due to impact was bulging and flattening with every respiratory cycle. This could be explained on the basis that in pediatric population the ribs are too pliable as they are more of cartilaginous nature than the adult ribs that are ossified and hard in texture that break easily on sufficient force. There was enough force that disrupted the underlying muscles and fascia but not sufficient to penetrate the skin. This is possible because the skin is more elastic than the underlying layers [13].

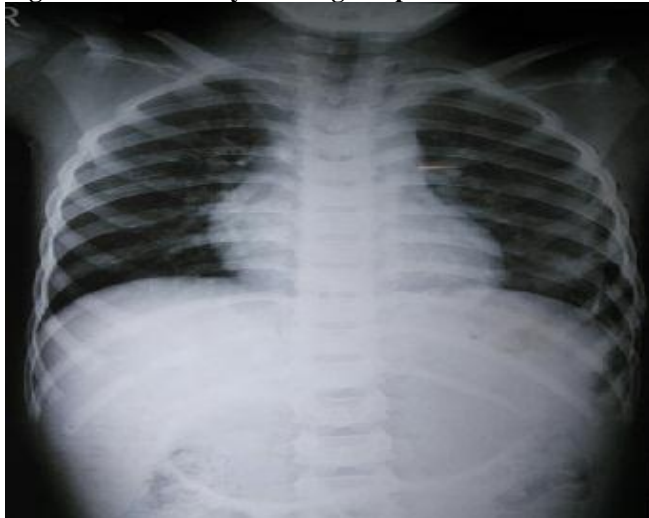
**Figure 1. Indrawing of chest wall in inspiration**



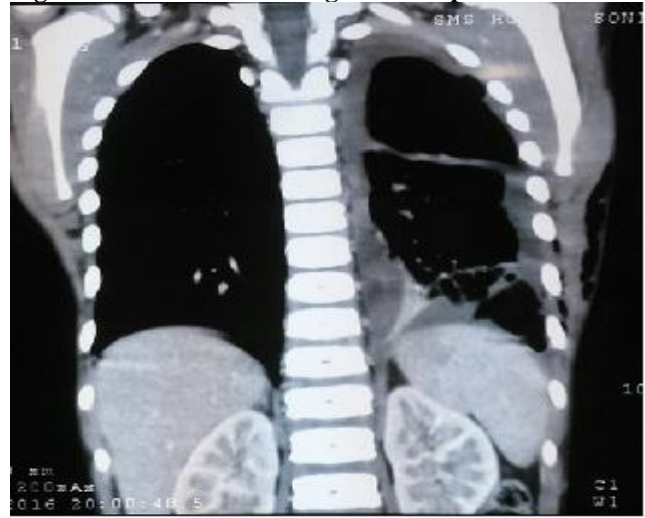
**Figure 2. Bulging of chest wall in expiration**



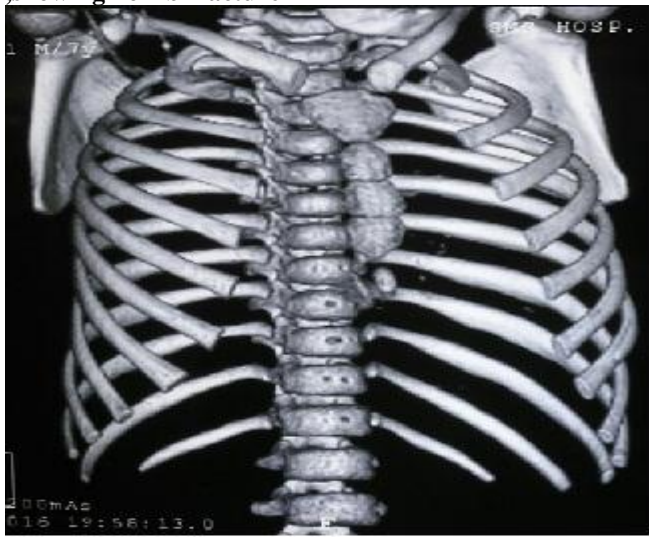
**Figure 3. Chest x ray showing left pneumothorax**



**Figure 4. CT thorax showing left hemopneumothorax**



**Figure 5. 3D reconstruction of chest wall anterior view, showing no rib fracture**



**Figure 6. 3D reconstruction of chest wall posterior view, showing no rib fracture**



**DISCUSSION**

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penetrate the skin. This is possible because the skin is more elastic than the underlying layers [13].

## CONCLUSIONS

Trauma due to animals especially due to Bull Horn could be dangerous to life as well as leave disability due to the site involvement.in pediatric population with chest injuries due to bull horn high index of suspicion should be kept for underlying lung injury and hemo /pneumothorax as the thoracic wall along with the skin is pliable enough to resist breach in continuity. CT scan thorax with 3D reconstruction of chest wall should be obtained and further treatment done with low threshold for invasive treatment as respiratory complications after significant chest trauma could arise earlier in pediatric population compared to adult population.

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## CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

## STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

## REFERENCES

1. Wasadikar PP, Paunikar RG, Desmukh SB. (1997). Bull horn injuries in rural India. *J Indian Med Assoc*, 95(1), 3-4, 16.
2. Ranim, Rohit, Sharma A, Dikshit PC. (2010). Injuries by bull horns, Patterns and prevention protocols. *J For Med & Toxicology*, 11(1),
3. HS Shukla, DK Mittal, YP Naithani. (1977). Bull horn injury-a clinical study. *Injury, The British Journal of Accident Surgery*, 9(2), 164-167.
4. MS Sekhon, HL Khatri, SS Grewal, SKS Marya. (1983). Bull horn injury. *Indian J Surgery*, 486-488.
5. JBV Rau. (1982). Bullgore injuries in rural areas. *Indian J Surgery*, 664-671.
6. Idikula J, Moses BV, Sadhu D, Agarwal S, Jahan G, Thomas J. (1991). Bull horn injuries. *Surg Gynaecol obstet*, 172(3), 220-2.
7. Singh H, Mahant TS, Narula IM, Dhaliwal RS, Suri RK, Gujral S. (1980). Cattle horn injuries. *Aust NZ J.Surg*, 50(6), 620-1.
8. Rudloff, Udo, Gonzalez, Victor, Esleban, Chirurgica Taurina. (2006). A 10 year experience of bullfight injuries. *J of Trauma-injury infection &Critical Care*, 61(4), 970-974.
9. Dogan KH, Demirci S, Erkol Z, Sunam GS, Kucukkartallar TJ. (2008). Injuries and deaths occurring as a result of bull attack. *Agromedicine*, 13(3), 191-6.
10. Atri SC and Mehdiratta NK. (1978). An analysis of civilian chest injuries. *J Ind Med Assoc*, 71,228-232
11. Chambers O, Girand C, Gouffrant JM, Debry C. (2003). A detailed examination of injuries to the head and neck caused by bull fighting and of their surgical treatment, the role of the cervico-facial surgeon. *Rev Laryngol Otol Rhinol*, 124(4), 221-8.
12. DK Pal, V Bora, SC Bisoi, US Dwivadi. (2002). Urethrorectal fistula by Bull horn injury. *J Indian Med Assoc*, 100(1), 47
13. Esposito TJ, Fedorak I. (1994). Traumatic lumbar hernia, Case report and literature review. *J Trauma*, 37, 123-6.

