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Injuries by Bull Horns: Patterns And Prevention Protocols

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ABSTRACT

The problem of stray cattle, which had led to many road accidents, including fatalities is quite rampant. Amongst these, deaths caused by Bull and other cattle are quite common in rural India. However, the incidence of such injuries is quite low in urban dwellings. The paper discusses four case reports where the victims succumbed to the injuries caused due to bull horn. An emphasis is given on the patterns of injuries that are caused due to bull horn impact along with the preventive measures to prevent such mishaps.

Keywords: Bullfight, Injuries, Abdominal trauma, Chest trauma, Cattle horn

Introduction

The Bull is normally a docile and easily domesticated animal, may sometimes become angry for no obvious reason.[1,2] Many a times, the stray cattle take over the function of traffic police officer. These stray cattle may sometimes endanger the life of passers-by. The Bulls and cows roaming in the parks, feeding on the grass and lazing in the sun is a common sight in Metropolitan cities. The commonest site of injury in bullhorn cases is the abdomen and perineal region. The injuries predominantly occur on right side of abdomen.[1,3] The reason for perineal involvement is its anatomical configuration leading horn hook to engage and penetrate.[4] The injuries caused by horns of bulls, cows or buffaloes are of various shapes, sizes and directions and are goring in nature and violent.[5] The wounds produced are contusions, lacerations, penetration of body cavities and rarely fractures. Mostly subcutaneous tissues and muscles are affected but visceral injuries are also quite

frequent. 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.[5] Fatalities resulting from injuries sustained due to bull goring are quite rampant owing to the lack of any specific guidelines for the same by the Corporation authorities. In the case reports that we present the raging bull killed four persons in three different incidences.



Figure 1. Patterned abrasion corresponding to bull horn in case 1.

Case Report I

A 65 years old man was attacked by a raging bull in the early morning while he was out on a walk. He was declared dead on arrival at the Hospital. The frenzied animal then started chasing a 46-year-old woman (Case II). The woman tried to hide behind a car but the bull banged away at the vehicle in an attempt to get her. The bull finally gored this woman to death stomping the body of the woman for about an hour. The local police finally shot the animal. The body was shifted to the mortuary of Lal Bahadur Shashtri Hospital, Delhi for the autopsy. On postmortem examination, on left side of body there were abrasions over face and head region, forehead, arm, little finger, front of abdomen, knee and upper half of leg. An important injury was patterned abrasion over right side front of chest (10x3 cm corresponding to Bull horn) (figure 1). There were lacerated wounds over the head region (left side of scalp and eye), front of right thigh (figure 2) and right third toe. On internal examination of head, there was subscalpal hematoma. In the chest there were fractures of ribs on right side with underlying contused lacerations of both the lungs and contused laceration over anterior surface of heart. There was about 1000 ml of fluid and clotted blood in pleural cavity and about 2000 ml in peritoneal cavity. There were multiple contused lacerations involving right lobe of liver.



Figure 2. Lacerated wound over thigh in case 1.

Spinal column was also involved where fracture of sixth thoracic vertebra combined with transaction of spinal cord was seen. From the findings, it was concluded that the death was due to hemorrhage and shock consequent upon multiple injuries to chest, abdomen and spinal column produced by blunt force impact.

Case Report II

A 46 years old woman was hit by a frenzied bull that chased her and when she tried to hide behind a car, the bull banged her. The bull finally gored this woman to death and kept stomping her body for about an hour. The local police then shot dead the animal. On autopsy, the injuries that were noted were bruise over right side of head and a lacerated penetrating wound over the abdomen from where the loops of intestine were protruding out. Multiple lacerations were evident over left upper and lower extremity with fractures of both bones of forearm. In addition, there were multiple small contused abrasions over both lower extremities, right side of chest and left side of abdomen (variable sizes 2x2 to 4x3 cm). In addition, there was grazed abrasion 5x3 cm consistent with being dragged across the ground over back of left thigh. Multiple linear abrasions were seen over left buttock (12x10 cm to 2x0.1 cm) and left thigh (3x3 cm). On internal examination, subscalpal hematoma was apparently evident. Injuries involving chest were in the form of bilateral rib fractures and lung ruptures similar to case I. There were multiple lacerations involving parenchyma of liver (figure 3) with about 2000 ml of fluid and clotted blood in peritoneal cavity. Bruising of mesenteries and loops of small intestine was evident. There were fractures of left iliac crest and dislocation of left sacroiliac joint. The findings were suggestive of death due hemorrhage and shock consequent to multiple injuries to chest, abdomen and pelvis produced by blunt force impact.

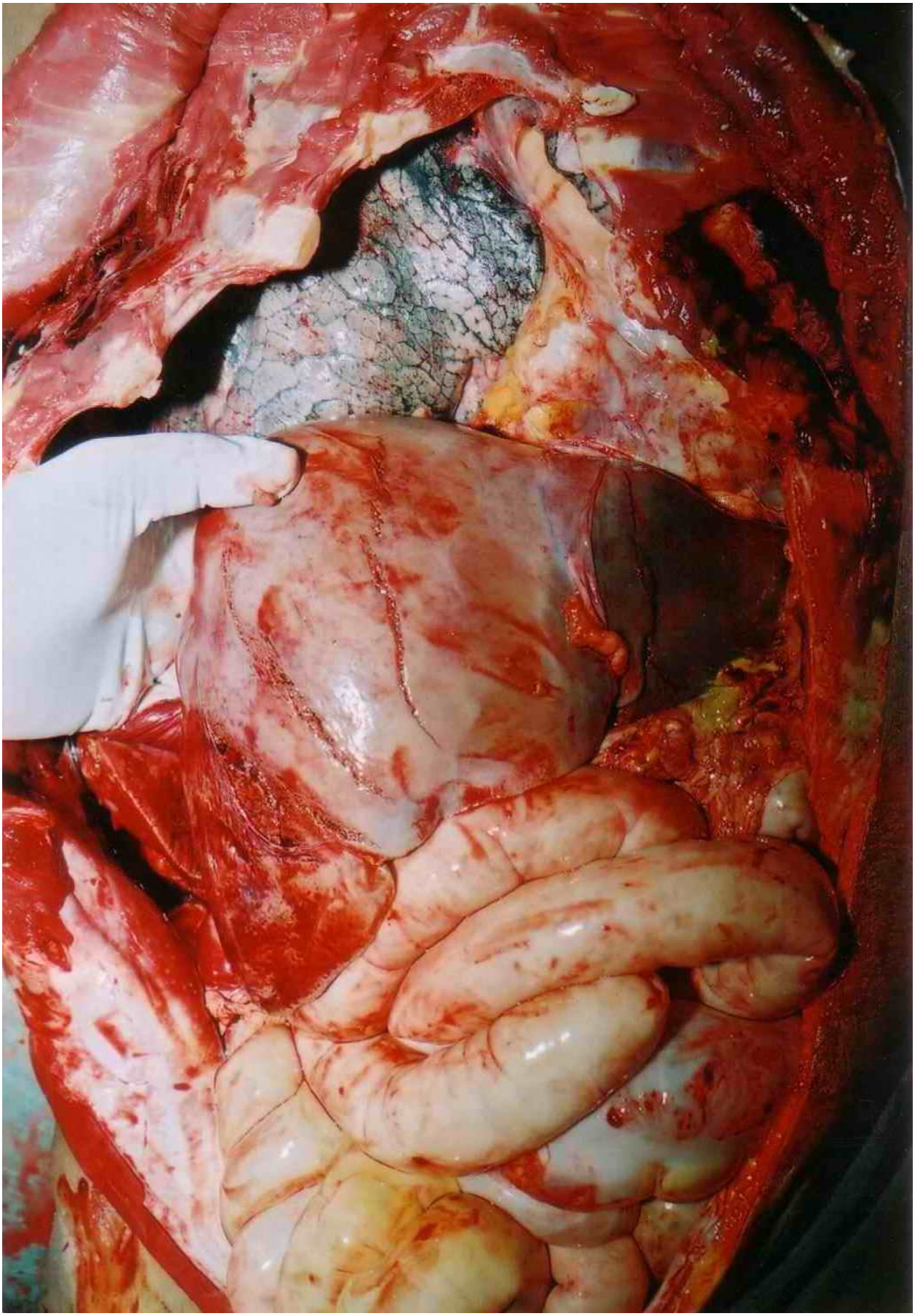


Figure 3. Rib fractures and lacerations of liver in case 2.

Case Report III

A 65 years old woman was hit by a bull when she was working at the door step of her house in Bihar and brought to Lok Nayak Hospital for treatment after the passage of five days. Externally, there was contused abrasion over left parietal area of head and contusion over left thigh. The former injury corresponded to the horn of bull. Internally, chest injuries were in the form of bilateral rib fractures. Again subscalpal hematoma underneath the left parieto-temporal area was evident quite similar to case II. In addition, internally hemorrhagic contusion over left temporal lobe of brain and subdural hemorrhage over bilateral cerebral hemispheres was seen. It was concluded that the death was due to cerebral damage consequent upon blunt force impact to head.

Case Report IV

A 65 years old male was hit by a bull and brought to UCMS & GTB Hospital for management where he was surgically operated and then shifted to Lok Nayak Hospital, New Delhi where he expired after the passage of six days. On external examination, there were stitched wounds over right elbow and right side front of abdomen. On internal examination, there were fractures of ribs on left side and body of sternum quite similar to case I and II. Both pleural cavities contained fluid and clotted blood. There were lacerations of left lung and right lobe of liver. From the findings, the death was due to hemorrhage and shock consequent upon blunt force impact to chest and abdomen.

Discussion

In India, Bull gore injuries are frequently observed in villages but incidences related to deaths from bull gore are infrequently seen in Metropolitan cities. The horn of bull are long, curved directed forwards with smooth tapering ends (Figure 4) that produces lacerations and can also penetrate the body cavities.

In France, Bullfight dates back to the 13th century and Spanish style bullfighting is called *corrida de toros* (literally a "running of bulls) even though this fight between man and wild bull has been described before in other countries.[6]



Figure 4. Bull Horns

Casey and colleagues[7] in a surveillance study of agricultural injury stressed that although cows greatly outnumber bulls on dairy farms, bulls account for 25% of animal related injury that are more severe in nature. Criddle[8] in a descriptive study associated with trauma related to livestock in patients that were brought to central Texas trauma center during a 5-year period concluded that Bulls were responsible for 94% of the cases involving cowboys. Dogan and colleagues[9] in a study of persons with occupations in animal husbandry concluded that Bulls were among the most dangerous of all the animals.

Bull horn lesions are frequent in the Latin World due to spectacles involving these animals. These wounds have special characteristics that distinguish them from other lesions.[10] Many a time bullfighters are injured seriously, or even gored to death inside the bullring.[6] Goring is taken when the bull horn penetrates deeply in the muscles as well as body cavities.[5] Nevertheless, goring is described a single injury by many researchers but it is a mix of lacerated wound, contusion and infection.[6] The wounds produced due to bull horn impact vary from contusions, lacerations, and penetrating wounds involving internal organs to fractures.[5]

The pattern of injuries vary as described by various authors depending on the height of the victim, the height of the bull and relative position of the animal at the time of attack. The injuries occur

more commonly on the abdomen and perineum. [1,2,3,5,9,11] In the abdomen, the horn first tears the subcutaneous tissues and later muscles and further if the violence is more, the peritoneum is punctured.[5] The frequency of injuries over the abdomen in other studies being 11.3%,[10] 3.7%[12] and 64%.[1] Since the head of bull is at the same level as victim's abdomen, this part of body is most exposed to the attack.[1] Although the surface area of abdomen is same as that of the chest, the abdomen suffers more than any other site. The reason appears to be lack of bony shield over the abdomen permitting the horn hook to engage and penetrate.[3]

In the bullring, the bullfighters most commonly sustain injuries on the abdomen.[6] 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,[4] injuries to anal canal and posterior vaginal wall[1] has been caused by bullhorn.

Many times impact by the bull or other cattle involves the thoracic region of body. Atri and Mehdiratta[13] 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[1,9] and penetrating injuries involving lungs.[11]

Involvement of extremities is an uncommon finding in such a impact by bull. In another study[10] the maximum number of cases involved lower extremities (63%). Three out of four cases sustained injuries over extremities in the present study.

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 manoueuvres, 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.[1,3]

Injuries caused by bulls are dependent on socio-cultural characteristics of the society besides the ecology of the environment. In this sense, in Spain throughout the year particularly in the summer months the bulls' participation is central to local festivities. In addition to bullfights in bullrings injured tend to be professional bullfighters. However, it Bulls tend to run through the streets entertaining the inhabitants but killing many people including children that come in their way.[14] Indian continent is not at all immune to such celebrations. Singh et al[15] reported an unusual case of bull gore injury sustained during harvest festival celebrations in which the patient presented with blowout fracture of the orbital floor with metal horn cover and decorated ribbons impacted in the orbit.

In our study of a series of four cases, the injuries occurred predominantly on right side of chest and abdomen. The obvious explanation for this could be victim using his right upper extremity to defend himself from the attacking animal and thus turning right region of the body towards the animal. Moreover, none of the anatomical region was spared since all the victims succumbed to injuries when they were gored by a raging bull while in most of the studies the injuries were

sustained while rearing, feeding or taking care of the animal. In our study, it is pertinent to note that there were injuries located over the spinal column and the Pelvis that are not seen in other studies. Most of the injuries over this region resulted from continuous stomping by the raging Bull. Prevention Protocols:

The number of stray cattle and commonly the bull is quite rampant in India. Delhi, like several other cities in the country, is plagued by the problem of stray cattle officially estimated at over 30,000 that comes from the city's 2,655 illegal dairies. They wander in the city, block traffic and defecate on roads and most importantly attack people and at times gore people to death. To prevent such mishaps in future stringent guidelines should be formulated. Few researchers advocate wearing helmets and steel-toed boots as a simple and important safety strategy to prevent bull gore injuries.[8,9]

Traffic police should be directed to keep stray cattle away from road dividers and busy sections of the roads thus minimizing attacks. In addition, to prevent the animal from causing serious injury to humans, there is need of popularization of dehorning of domestic and stray cattle.[7] A more effective and prevalent method is local application of caustic potash when the calf is two months to two years old[11] to encourage dehorning. As proposed by other workers catching the stray cattle, restraining, or confining them in specially designed facilities to avoid human contact is an important step.[7,9] In an effort to end stray cattle menace, Governments of Delhi, Punjab and Gujarat have come up with various directives to be followed in this regard. Municipal Corporation of Delhi (MCD) is implanting microchip in the rumen of the animal that bears a unique Cattle identification number to help ascertain the cattle's ownership and track their movement.[16] This would keep a check on illegal dairies and prevent smuggling of animal. In addition, MCD plans to impose a fine of Rs 5000 on the original buyer if an auctioned animal is rounded up. Moreover it is the duty of all the political parties to join hands to fight the cattle menace on a common platform.

As far as role of law makers is concerned, Delhi High Court has ordered the Delhi government to cancel the license of a dairy or cattle shed if the cattle stray out of owner's dairy or cattle shed. Under section 289 of the Indian Penal Code there is provision for prosecution of cattle owners whose cattle stray and roam about freely. Delhi High Court is following other stringent measures like disconnection of water and power supply to all illegal dairies and cattle sheds that are flourishing in the city.[17] Section 289 of the Indian Penal Code also guarantees an imprisonment for a period of six months to one year if the owner fails to prevent its cattle from causing any probable danger to human life or grievous hurt. In addition Delhi High Court in July-August, 2005 directed the Delhi Police to make use of section 133 Criminal Procedure Court for removal of illegal dairies or cattle sheds.[17]

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