



## Review

# Matador versus taurus: bull gore injury

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**Bull fighting is a reality and the injuries sustained by the matador cause a bizarre pattern of injury that the trauma surgeon must appreciate since they are inflicted in unique circumstances. This article highlights the mechanism of a bull gore injury, the pattern of wounds, and the most appropriate management.**

*Key words:* Bullfighting – Bull gore injury – Penetrating trauma – Matador

The scene is set, Spain, summer, a bullfight. Thousands of spectators await a controversial interplay between man and beast. Mutilating yet magical, the matador stands tallest set an almost impossible task – to conquer nature, taurus, the bull. Matadors are revered throughout the bullfighting community. They represent, a time long gone, of men being warriors, as well as sexual symbols.<sup>1</sup> Women may swoon over their bravery and men may wish to emulate their mastery, but no one would wish to suffer a bull gore injury.

### Mechanism of injury

The bull is not a normally aggressive animal, and may be domesticated. However, aggressive behaviour may be displayed for no apparent reason.<sup>2</sup> Bull fighting promotes aggressive behaviour to create spectacle.

Bull horn injuries have not been regularly documented in the literature. The mechanism of injury allows understanding of the complex wound patterns seen due to interaction of multiple distinct forces (Fig. 1).

As the matador stands in front of the bull, the horn of the attacking animal follows a semicircular path sideways or upwards.<sup>3,4</sup> Wound depth is dependent on the force of penetration of the bull's horn into the matador's body,



Figure 1 Matador about to sustain bull gore injury.

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**Figure 2** Matador thrown after disengagement from bull's horns.

and the animal's lean weight and speed.<sup>3,5</sup> On horn impaction, kinetic energy will be transformed into potential energy, so the surgeon must be suspicious of underlying injuries not visible initially.<sup>3</sup> The bull's strong neck muscles used to angle and raise its horns are an additional force causing upward tears at right angles to the ground. As the gored matador's body is lifted and suspended by the bull's horns, his body weight exerts an equal yet opposite force. An unstable balance exists dependent on the centre of gravity relating to the horn allowing rotational movement whilst the animal attempts to disengage the person's body. This rotational movement accounts for the 'rag-doll', 'spinning top' appearance on goring. True pathways of injury necessitate slow motion photography due to the speed of injury (Fig. 2).<sup>5</sup>

#### Patterns of injury

In bull gore injury due to bull fighting, the thigh and lower leg accounts for 50% of all wounds.<sup>3,4</sup> Tissue elasticity may conceal lesions distant from horn puncture. Major vessels are lacerated on rotational movement of the bull's head leading to retraction of the intima and media of the vessel affecting Virchow's triad slowing bleeding.<sup>6</sup>

The second commonest site of bull gore injury in the matador is the perineal area. Scrotal avulsion often requires plastic surgical reconstruction.<sup>7</sup>

Bull horn wounds are usually penetrating and contusive; they have special characteristics, the entry point being small and corresponding with a gap in the aponeurosis. Two or more deep wound tracts may be present hiding important muscular destruction. Wounds are often contaminated with multiple foreign bodies such as cloth fragments, dirt and horn chips.<sup>3</sup>

Abdominal injuries have been documented as most common on the right side of the abdomen. Damage to the intestine may only be seen in 10% of cases.<sup>4</sup> The predominance of injury to the right side of the abdomen may be because the patient turns the right side of his body towards the animal to use his right arm in self defence. The skin of the abdomen or perineum lies tangentially to the semi-circular movement of the tip of the horn so a relatively superficial laceration is inflicted leaving deeper structures intact.<sup>5,8</sup> One case reports a bull horn entering the skin at the level of the inguinal ligament and, after transversing the muscular layers, exiting 15 cm away



**Figure 3** Bull gore injury patterns offer a variety of bizarre and complex wounds

without injuring the peritoneum or tearing intervening skin. Similar subcutaneous transfixation injury has been described before in buffalo attacks.<sup>8</sup>

### Management of bull gore injuries

Advanced trauma and life support guidelines should be adhered to. Regarding bull gore injuries, an eye-witness account of the mechanism of injury, exploration of all wound tracts under local or general anaesthesia and enlargement of small cutaneous puncture wounds should allow damage assessment.<sup>3</sup>

Traditional wound management consists of irrigation, debridement of devitalised tissue, drainage and haemostasis. Historically, wounds have been left open or partially open, with treatment by broad-spectrum antibiotics. Documented complications have included cutaneous necrosis in large wounds, seromas, superficial phlebitis, pneumothoraces, pneumonia and lung atelectasis and evisceration through the horn opening.<sup>3</sup>

Trauma to the anus, rectum and large bowel promote higher morbidity due to faecal contamination. Colonic perforation with the bull's horn with faecal contamination may necessitate colonic excision with a sigmoid colostomy and distal mucous fistula or Hartmann's operation.<sup>6,9,10</sup>

If the wound lies within the extraperitoneal rectum, a sigmoid colostomy is usually indicated with a distal mucous fistula, perineal debridement, and repair of the rectum if possible.<sup>6,9-11</sup> Horn wounds involving the perineum require careful examination to determine the integrity of the rectum and of the sphincter area. When the sphincters are involved, primary repair is mandatory.

The need for a faecal diverting colostomy must be assessed in these cases with wide debridement of the wound and systematic perineal drainage.

### Conclusions

Bull gore injury patterns and management offer a variety of bizarre and complex wounds. It is a testimony to efficient, accurate trauma management that a gored matador can return to the ring, and seek greatness once again (Fig. 3).

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