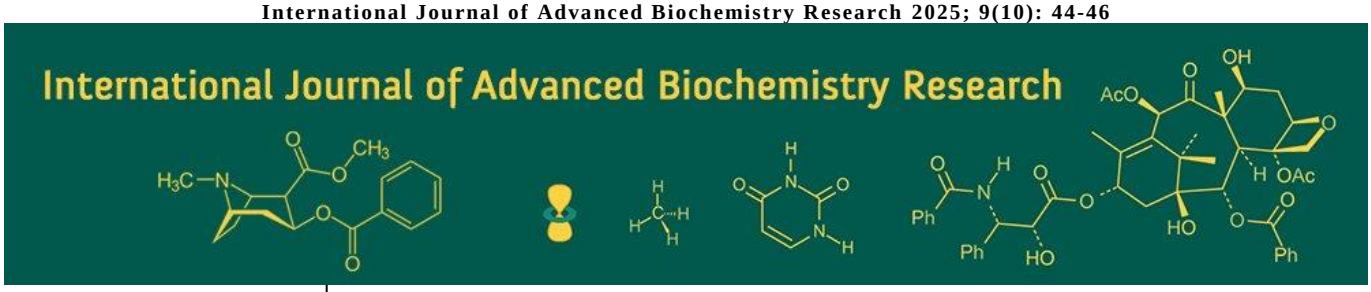

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Reconstructive sliding flap surgery and castration in a pony with extensive gore injury wound concurrent with testicular evisceration

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Abstract
A 2-year-old intact male pony was presented to LAC-OP-Surgery Unit at VC&RI, Theni with the history of extensive deep lacerated wound on the latero-medial aspect of the right thigh region caused by a wild buffalo. Clinical examination revealed profuse bleeding with deep ulcerative wounds on the latero-medial aspect from the right thigh region to the medial left thigh with prolapsed right testicle with severed spermatic cord and extensive tissue damage. Emergency haemostasis with Tamponade was done and routine biochemical test was done to rule out organ health and for management of intra operative shock. The case necessitated immediate surgical intervention, since the profiles were not alarming. Standard safe anaesthetic protocol was administered following pre stabilization against shock. Animal was positioned in right lateral recumbency and the prolapsed testicle was excised as per standard operating procedures and the contra lateral testicle was also castrated. Following which, debridement and exuberant lavaging protocols were performed. Since the vitality of the right latero-medial skin was healthy with intact vascular subdermal plexus, reconstructive procedure involving a sliding single pedicle flap was done. The patency of the penile and pelvic urethra was ascertained through a foley catheter which revealed intact urethral lumen. After completion of reconstructive procedure an indwelling drain was placed on the medial aspect of the thigh to facilitate post operative drainage of exudates. Following anaesthesia recovery, the pony was medicated with Inj.Ceftriaxone 10mg/kg, Inj.Flunixin 1.1 mg/kg for 7days, periodic dressing was advised to perform on the alternative days and pony had uneventful recovery.

Keywords: Extensive gore injury, testicular prolapse, sliding skin flap, reconstructive, pony

Introduction

Case History

A 2-year-old intact male pony was presented to LAC-OP-Surgery Unit at VC&RI, Theni with the history of extensive deep lacerated wound on the latero-medial aspect of the right thigh region. The etiology was found to be a gore injury from a wild buffalo. Clinical examination revealed profuse bleeding with deep ulcerative wounds on the latero-medial aspect from the right thigh region to the medial left thigh with prolapsed right testicle with severed spermatic cord and extensive tissue damage. Subjective evaluation of the wound revealed reddish colored wound surface with profuse exudation and bleeding accompanied with malodor. The animal evinced high grade pain with mild muscular tremors. A mild decrease in temperature, elevated heart rate and pulse, congested mucous membrane and mild excitement was observed. Since the wound was exuberant and standard apposition techniques might not be apprehensive alternative reconstructive techniques were planned. The severed testicular cord and the intact testicle may not warranty the breeding efficiency of the pony, hence standard castrative procedures were explained to the owner and a consent was obtained. Routine hemato biochemical profile were performed to rule out organ health. Mild decrease in Hemoglobin, RBC and Platelet counts was observed. An increase in the WBC and neutrophilia was observed along with an increase in ALP was observed.

Treatment

The case necessitated immediate surgical intervention, since the profiles were not alarming. In Haemogram, there was slight decrease in the hemoglobin (9.2 g/dl) level but PCV was normal. The anemia and hypoproteinemia were presumed to be secondary to blood loss, as clinical evidence of vasculitis was present. Biochemical analysis revealed normal levels of BUN (13.2 mg%) and Creatinine kinase (243 U/L), with slightly elevated ALT level (63.1 U/L) and decreased Blood Glucose (35 mg/dl), Total Protein (4.79 gm%) and Calcium (8.91 mg%). Intravenous fluid therapy (17.6 mL/kg/h) with a balanced electrolyte solution was initiated. Following stabilisation the pony was premedicated with butorphanol at the dose rate of 0.01 mg/kg intravenous and anesthesia was induced with ketamine and midazolam at the dose rate of 2.5mg/kg and 0.05mg/kg intravenously. Endotracheal intubation was performed with a 13 I.D and was maintained with isoflurane along with oxygen carrier gas under rebreathing circuit. Animal was positioned in right lateral recumbency and the prolapsed testicle was excised as per standard operating procedures and the contra lateral testicle castrated. Following which, adequate tissue debridement and exuberant lavaging protocols under 11 psi with sterile ringer lactate were performed until bright red color and angiogenic. Standard apposition protocol was not possible due to a larger defect, hence an alternative skin flap incorporating the scrotal skin and an single pedicle sliding skin flap involving right latero-medial skin that was healthy with intact vascular subdermal plexus, was planned. Flap margination, elevation, positioning and suturing with intradermal suture patent with PGA No.1-0 followed by skin suture with criss cross pattern was performed. The patency of the penile and pelvic urethra was ascertained through a foley catheter which revealed intact urethral lumen. After completion of reconstructive procedure an indwelling drain was placed on the medial aspect of the thigh to facilitate post operative drainage of exudates. Following anaesthesia recovery, the pony was medicated with Inj.Ceftriaxone 10mg/kg, Inj.Flunixin 1.1 mg/kg for 7days, periodic dressing was advised to perform on the alternative days and pony had uneventful recovery.

Discussion

Bull gore wounds often combine penetrating horn injuries with blunt-force trauma to the chest, spine, and long bones. Rani M *et al.*, 2012 [5] Because bulls are inherently aggressive, any patient with such injuries should be treated from the outset as a polytrauma case. A distinctive feature of domestic bull-horn wounds is the common occurrence of bowel prolapse through the abdominal wall, which frequently occurs without intestinal perforation. (Gupta V, *et al.*, 2009) [7] Bull horn injuries differ from other penetrating trauma by producing extensive muscle tearing,

multiple wound tracts, retained foreign material, and a disparity between the external appearance and the internal severity of injury. Monferrer-Guardiola R. 1990 [6] These wounds carry a high risk of bacterial contamination. Most equine skin injuries, even those with substantial tissue loss, can be managed successfully with appropriate care. (Wang. A.L. *et al*., 2015) [3] Body and proximal limb wounds in equines tend to contract and heal with less problematic granulation tissue, whereas large degloving injuries of the lateral and ventral abdomen usually require reconstructive surgery. The vascular anatomy supplying large skin flaps can be complex; most degloving injuries progress cranial to caudal, as in the present case. (Giuliano, E.A., 2010) [1] If the subcutaneous layer beneath a degloved flap retains blood supply, the likelihood that the skin flaps will remain viable increases. (Fleury *et al*., 2000) [2]

Large flaps from the ventral abdomen or scrotal region must be carefully evaluated for both viability and contamination. Thorough debridement and appropriate suturing are best performed with the patient recumbent rather than standing. Drains, either passive or active, should be placed at multiple levels to evacuate contaminated fluid. Tacking sutures can eliminate dead space, but they were not needed in this case because significant dead spaces were absent. The keys to successful repair of extensive wounds are tension-free closure of the skin flap and adequate drainage. Equine skin wounds generally heal rapidly but can become complicated when trauma is severe. Optimal management therefore combines prompt surgical and medical intervention. The central principle of the technique described here is to maintain close apposition and immobilization of the flap to the wound bed (Fahie M., 2012) [4]

Evenly distributed pressure across the flap controls hemorrhage, prevents gap formation beneath the flap, and promotes optimal healing. Equine skin wounds generally heal rapidly but can become complicated when trauma is severe. Optimal management therefore combines prompt surgical and medical intervention. The central principle of the technique described here is to maintain close apposition and immobilization of the flap to the wound bed. Evenly distributed pressure across the flap controls haemorrhage, prevents gap formation beneath the flap, and promotes optimal healing. Regeneration initially progresses more slowly than degeneration. New capillary ingrowth occurs at approximately 0.5 mm/d. For this reason, a risk of ischemic necrosis of the skin flap is given until the vascularization is completed.

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