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Surgical management of Exuberant Granulation Tissue (EGT) in a racehorse: A case report

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Abstract

A three-year-old Thoroughbred racehorse was presented to the Equine Hospital of the Madras Race Club with a chronic wound over the cannon bone region of the hind limb, characterized by intermittent bleeding and excessive granulation tissue formation. The lesion was diagnosed as exuberant granulation tissue (proud flesh) and was surgically excised under general anesthesia maintained by a triple-drip infusion of guaifenesin, xylazine, and ketamine. Postoperative management included topical treatment of the wound with white lotion, copper sulphate and tincture iodine, along with wound flushing using normal saline and Betadine. Systemic therapy consisted of intravenous administration of antibiotics and anti-inflammatory drugs, as well as supportive medications. This case highlights the effective surgical and medical management of exuberant granulation tissue in a racehorse, resulting in successful recovery.

Keywords: Wound, proud flesh, white lotion and copper sulphate

Introduction

Exuberant granulation tissue, commonly referred to as proud flesh, is a frequent complication of wound healing in horses. In equines, it can significantly impair the normal wound repair process. Although the exact cause remains incompletely understood, several predisposing factors have been identified, including the unique anatomy and function of the distal limb, excessive movement at the wound site, reduced tissue oxygenation and perfusion, persistent contamination, altered levels of growth factors such as transforming growth factor- β 1 (TGF- β 1), an imbalance between collagen synthesis and degradation, and prolonged low-grade inflammation. These factors collectively favor the development of exuberant granulation tissue in horses (Fretz *et al.*, 1983; Cochrane *et al.*, 2003; Lepault *et al.*, 2005; Miller *et al.*, 2000) [5, 3, 6, 7]. Wounds occurring distal to the hock are particularly prone to exuberant granulation tissue formation, which can impede normal healing unless removed by debridement. This tendency is further increased when wounds are located in regions subject to frequent movement, such as areas overlying tendons, where mechanical stimulation promotes excessive granulation tissue formation (Frank, 2002) [4]. The present article describes the surgical management of exuberant granulation tissue in a racehorse, highlighting the clinical presentation, surgical intervention, postoperative care, and treatment outcome.

Case history and clinical observation

A 3-year-old Thoroughbred racehorse was presented to the Madras Race Club Equine Hospital, Guindy, Chennai-600032, with a history of an abnormal growth over the cannon bone region of the hind limb (Fig. 1). The lesion appeared as a mass of exuberant granulation tissue with a small associated wound at the site, which had gradually increased in size over the past six months. On clinical examination, the granulation tissue was found to be firmly attached to the surrounding skin. The lesion was characterized by a raised, reddish, and irregularly shaped mass consistent with exuberant granulation tissue (proud flesh). The case was managed initially with the regular topical application of astringents to reduce tissue proliferation.



Fig 1: Proud flesh



Fig 2: Application of copper sulphate



Fig 3: Complete arrest of proud flesh

Surgical procedure and treatment

The horse received premedication with xylazine (1.1 mg/kg) and butorphanol (0.01 mg/kg) prior to anaesthesia induction. General anaesthesia was initiated with ketamine (2.2 mg/kg) and maintained through a triple-drip solution containing 5% guaifenesin (50 mg/mL), xylazine (500 mg), and ketamine

(1000 mg). The surgery was carried out with the horse positioned in lateral recumbency, while an assistant held the hind limb firmly. The granulation mass was carefully excised, and arteries were ligated using Vicryl no. 2 sutures. Minor bleeding from small vessels was controlled by direct application of potassium permanganate using sterile gauze.

Topical treatment of the exuberant granulation tissue involved alternate-day application of white lotion, copper sulphate and tincture iodine for a period of 15 days (Fig 2 & 3). After surgery, the wound was rinsed daily with normal saline followed by Betadine solution for three days. The postoperative regimen included intravenous administration of Artizone (4.4 mg/kg once daily), benzyl penicillin (two vials twice daily), and a single dose of tetanus toxoid (2.5 mL) on day one, along with oral Serratiopeptidase. Supportive medications such as ranitidine (20 mL twice daily), tonophosphan (20 mL once daily) and Neurobion Forte (20 mL once daily) were given for seven days to aid recovery.

Discussion

The development of Exuberant Granulation Tissue (EGT) in horses is influenced by multiple factors, including bandaging, wound location, mobility of the affected area, the type of tissues involved, breed predisposition and iatrogenic influences (Wilmink and Weeren, 2004) [9]. In this case, the clinical signs and findings were consistent with equine proud flesh, as described by Mohammed Arif Basha *et al.* (2019) [8]. Allowing a wound to remain unbandaged after it has filled with healthy granulation tissue can help reduce the risk of EGT formation. This approach is particularly effective in distal limb wounds, where excessive tissue proliferation is common. Healing of equine limb wounds is frequently complicated by hypergranulation, secondary infections (bacterial, viral, or fungal), or, in rare cases, neoplastic changes (Bader and Eesa, 2011) [1]. During the proliferative phase of wound healing, granulation tissue is essential for repair; however, in distal limbs, it often grows beyond the level of the surrounding skin, contributing to proud flesh formation.

In this case, surgical excision followed by the use of astringents and medical management effectively prevented further excessive growth and complications. Topical chemical cauterization with agents such as copper sulphate crystals was used to control excessive granulation tissue by reducing the volume of overgrown tissue in the wound bed. However, caustic chemicals can be cytotoxic to migrating and proliferating epithelial cells, which may impede epithelialization and delay complete wound closure (Bertone, 1989) [2].

Conclusion

Exuberant granulation tissue is a common complication of distal limb wounds in horses, often hindering normal wound healing. In the present case, surgical excision combined with the topical application of white lotion and copper sulphate facilitated optimal wound healing. This approach proved to be safe, cost-effective and time-efficient, effectively controlling excessive granulation tissue while preventing recurrence. Careful postoperative management, including wound flushing and systemic support, played a crucial role in achieving complete recovery. This case demonstrates that timely surgical intervention, followed by appropriate topical and medical therapy, can lead to successful outcomes in racehorses, potentially allowing them to resume athletic performance without postoperative complications.

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