

# Evisceration in a thoroughbred gelding following application of a topical chemotherapy agent for the treatment of sarcoids.

Alexandra Baldwin<sup>1</sup>, Tim Mair<sup>1</sup>, and Evita Busschers<sup>2</sup>

<sup>1</sup>Bell Equine Veterinary Clinic

<sup>2</sup>University of Bristol

October 17, 2022

## Abstract

This report describes the evisceration of the jejunum following acute dehiscence of the abdominal wall in an 18 year old gelding which had undergone treatment for suspected sarcoids on the ventral abdomen with a topical caustic/chemotherapy agent 6 weeks previously. The sarcoid lesions appeared to be responding appropriately to the topical therapy until the day of presentation. The jejunum was safely contained in an abdominal bandage and the horse underwent emergency referral before immediate anaesthesia and further assessment. The horse was euthanased at the owners' request following a guarded prognosis.

*Evisceration in a thoroughbred gelding following application of a topical chemotherapy agent for the treatment of sarcoids*

Alexandra Baldwin\*, Tim S. Mair and Evita Busschers

Bell Equine Veterinary Clinic, Butchers Lane, Mereworth, Kent, ME18 5GS, UK

\*Corresponding author: Alexandra Baldwin [a-j-baldwin@yahoo.co.uk](mailto:a-j-baldwin@yahoo.co.uk)

Keywords: horse,

## Summary

This report describes the evisceration of the jejunum following acute dehiscence of the abdominal wall in an 18 year old gelding which had undergone treatment for suspected sarcoids on the ventral abdomen with a topical caustic/chemotherapy agent 6 weeks previously. The sarcoid lesions appeared to be responding appropriately to the topical therapy until the day of presentation. The jejunum was safely contained in an abdominal bandage and the horse underwent emergency referral before immediate anaesthesia and further assessment. The horse was euthanased at the owners' request following a guarded prognosis.

## Introduction

Sarcoids are locally aggressive fibroblastic tumours that are the most common neoplasm in equids, reportedly accounting for up to 67% of all neoplasms (Ragland et al. 1970; Cotchin 1977; Marti et al. 1993; Sullins et al.1986). The tumours are non-metastatic but can be very aggressive locally. Although metastatic dissemination does not occur, the tendency for exacerbation means that treatment is usually recommended, especially whilst the lesions are small and manageable (Knottenbelt et al. 2015).

Currently no treatment is available which produces repeatable resolution in all cases and the prognosis is always guarded because of the high risk of recurrence and development of new lesions (Knottenbelt et al. 2015). Numerous different treatment modalities are available, but none are universally effective, and none can be applied in all cases. The choice of which treatment to use in an individual horse will be affected by

factors such as the type, location, extent and duration of the sarcoids, as well as cost. Treatment options include ligation, sharp surgical excision, laser excision and ablation, cryosurgery, hyperthermia, electrocautery, immunomodulation, autogenous vaccines, anti-viral drugs, radiotherapy and topical / intralesional chemotherapy (including electrochemotherapy). For practical reasons, topical and intralesional treatments are commonly employed in equine practice to treat sarcoids. Topical drugs include chemotherapy agents such as 5-fluorouracil, and compounds containing heavy metals, such as arsenic trioxide, mercuric chloride and antimony sulphate. One compound commonly used in the UK is AW5-LUDES cream<sup>1</sup>(sometimes referred to as the “Liverpool cream”, sourced from Equine Medical solutions), which is a formulation containing fluorouracil (an anti-metabolite chemotherapy agent) and heavy metals. The cream is strongly caustic, and there is a significant risk of spread / run-off where the material causes damage to adjacent normal tissues. This case presents a previously undocumented complication of AW5-LUDES cream treatment.

### *History*

An 18 year old Thoroughbred gelding presented as an emergency referral following evisceration of the jejunum. The herniated intestine was found by the owner protruding from the ventral abdomen in an abdominal band of its rug. AW5-LUDES cream had been applied to several suspected sarcoids including one on the ventral abdomen with the most recent application six weeks previously. The exact treatment regime (including the concentration of the ingredients of the cream and the frequency of application) was not recorded. The herniated intestine had been supported in an abdominal bandage by the referring veterinarian, who also administered intramuscular procaine penicillin, intravenous gentamicin and flunixin meglumine, and organised immediate referral.

### *Clinical findings and outcome*

On admission to the hospital the gelding was bright and alert with a slightly elevated heart rate of 44 beats per minute, but no colic signs. The abdominal bandage was in place with evidence of peritoneal fluid draining through it. A preoperative blood sample revealed a packed cell volume (PCV) of 28% (normal reference range [rr] 30-50%), total protein of 52g/L (rr 51-83g/L), peripheral lactate of 0 mmol/L (rr <10 mmol/L) and mild leucopenia (WBC count  $4.7 \times 10^9$ /l; rr 5-10  $\times 10^9$ /l).

Following aseptic placement of a 14 gauge intravenous catheter<sup>2</sup> in the left jugular vein and sedation with romifidine<sup>3</sup> (0.15mg/kg IV), anaesthesia was induced with ketamine<sup>4</sup> (2.8mg/kg IV) and diazepam<sup>5</sup> (0.04mg/kg). A swing door was used to encourage safe induction and to minimize trauma to the intestines. The horse was placed in dorsal recumbency and anaesthesia was maintained with isoflurane<sup>6</sup> in 100% oxygen. Removal of the bandage revealed a 15cm diameter necrotic full thickness segment of the body wall including the necrotic sarcoid on the ventral caudal midline abdomen (Figures 1 and 2). Direct communication with the peritoneal cavity was present on the left side of the lesion from which approximately 1m of jejunum had eviscerated. This jejunum was moderately contaminated with debris and pus, and there was serosal inflammation and haemorrhage within the mesentery. The body wall adjacent to the defect appeared devitalised with a 10cm diameter segment of compromised tissues, contaminated with maggots (Figure 3).

Due to the degree of contamination, and necrosis of the skin and muscular tissue, treatment by debridement and closure using a mesh device was recommended, and the owner was advised of a guarded prognosis due to potential risks of peritonitis, infection of the implant and wound dehiscence. Due to limited finances and the guarded prognosis, the owner elected to euthanase the horse.

### *Discussion*

There is currently no universal treatment for equine sarcoids. The ultimate goal in treatment is to remove all tumour cells. It is imperative to take into account all factors when choosing a suitable regimen for each case, however finances and compliance of the client and horse may become the most influential factors.

A variety of topical chemotherapy agents are used such as acyclovir and 5% fluorouracil. However, one study suggested that the former drug has little benefit (Haspelslagh et al. 2017), but the latter has produced good results as an adjunct to surgery or cryotherapy (Knottenbelt and Kelly 2000).

AW5-LUDES cream is a compounded medication available for veterinary surgeon application only from Equine Medical Solutions as a special product, produced and prescribed to an individual horse as per the United Kingdom licensing Cascade (GOV.UK, 2022). It was previously referred to as AW3 or AW4 in older preparations and has been widely used in this country. A protocol is created for each case, determined by the appearance/type of sarcoid, location and response to previous treatments (Knottenbelt and Walker 1994). The cream contains 5-fluorouracil, thiouracil, heavy metal salts and steroid, and is produced in several different concentrations. Initially a single application of AW3-LUDES cream was reported to be successful in 80% of cases when 50,000 lesions were studied in 100 horses (Knottenbelt and Walker 1994). However, a later study of AW4-LUDES cream reported only 35% success rate when it was used as the primary treatment in periocular sarcoid cases (Knottenbelt and Kelly 2000). It is worth noting, however, that periocular sarcoids are characteristically different and potentially more difficult to treat than sarcoids in other areas of the body.

Localised pain and swelling are expected from 24 hours after application of AW5-LUDES cream, and horses may be dull and reluctant to ambulate for a period of 4-6 days. These signs are usually resolved by oral phenylbutazone treatment. The tumour mass is noted to blacken and develop a well-defined border with the surrounding healthy tissue. Histological findings support preferential penetration of the abnormal tissue, although it is suggested that stronger preparations may have deeper and less specific effects. Scarring has been recorded, usually causing solely cosmetic issues, and delayed wound healing can present in more mobile areas (Knottenbelt and Walker, 1994). Collateral damage to adjacent healthy tissues due to runoff or misapplication, and poor results due to non-compliance of application may also occur. Prior to application, it is important to consider the underlying anatomy and, therefore, potential complications. These may include haemorrhage, neuropathies and associated paralysis, necrosis of healthy tissues and associated infection, or in more severe cases, loss of sight (Knottenbelt and Kelly, 2000). Extensive eyelid necrosis and loss of the underlying globe has been reported in one case, however the horse had undergone previous home treatments unbeknown to the treating veterinarian (Knottenbelt and Kelly, 2000). The use of AW5-LUDES cream is now contraindicated around the eye or overlying the facial nerve (Knottenbelt 2019), and alternative treatment methods are recommended where complications encountered are likely to be severe and life changing. The authors have also encountered a horse that developed septic arthritis of a metacarpophalangeal joint following the application of AW5-LUDES to a sarcoid located on the dorsal fetlock; the treatment had resulted in widespread necrosis of the skin, subcutaneous and dorsal joint capsule (unpublished observation).

Following the presentation of this horse, an internal review was conducted which found 1595 similar lesions treated in the 3 years prior, of which this was the only case of evisceration. Since use of the cream started, the manufacturer has had no other evisceration cases reported (Knottenbelt, personal communication, 2021).

Evisceration of the abdominal contents can be a fatal event in horses and has been recorded following castration (Moll et al. 1995), due to acute abdominal dehiscence of a ventral laparotomy incision (Hann et al. 2022) or subsequent to penetrating abdominal wounds (Netto et al. 2006). Prognosis for survival decreases with increasing time, deteriorating condition of the horse, length of intestine eviscerated, intestinal damage or contamination, and the requirement for intestinal resection anastomosis (Van der Velden 1988; Thomas et al. 1998). Survival rates of young horses undergoing surgical repair for evisceration post castration is reported to vary from 36.4% (Hutchins and Rawlings 1972) to 87.5% (Hunt and Boles 1989), although rapid surgical intervention was instigated in those cases with better outcomes. Following dehiscence of the linea alba post laparotomy, secondary closure is usually performed rather than mesh placement due to infection in the tissues. This technique however requires suture placement 5cm from the edge of the wound (Tulleners et al. 1983; Freeman et al, 2002), which due to the extent of the tissue devitalisation in this case was not possible

It is possible that the lesion being treated in this horse was a different neoplasm. Most suspected sarcoids are not confirmed histologically prior to treatment as tissue biopsy can be contraindicated (Ragland et al. 1970). Similar-looking lesions can include fibrosarcoma, fibroma or neurofibroma (Knottenbelt and Kelly 2000). It is worth noting that the response of these other tumours to AW5-LUDES cream is unknown. Verrucous or fibroblastic sarcoids and similar appearing neoplasms seem to be most commonly contained within the

epidermis and dermis (Murray et al. 1978). Around the eye however, deeper invasion into the subcutis and musculature is a frequent finding and is associated with a negative prognosis as the muscles become distorted and weakened (Knottenbelt and Kelly 2000). It is possible that sarcoids in other locations may invade in a similar way, but unfortunately samples of the tissue were not submitted for histopathology in this case. More information is required on the invasive nature of sarcoids in different locations and hallmarks of this kind of tumour behaviour.

This case report describes a serious complication following treatment with AW5-LUDES cream. It is worth noting that there is minimal recently published evidence surrounding the use of AW5-LUDES cream in a variety of locations. The evidence surrounding periocular sarcoids should be interpreted with caution, although it may guide decision making where sarcoids are suspected to have invaded more extensively. Referral of the horse was carried out in a timely manner with minimal damage to the intestines and did not contribute to the decision to euthanase the horse. Severe necrosis of apparently previously healthy surrounding tissues was the precluding factor for difficulty in defect closure and guarded prognosis.

#### *Manufacturers' names and addresses*

1. Equine Medical Solutions, UK
2. MILA International Inc, Kentucky, USA
3. Sedivet, Boehringer Ingelheim Animal Health, UK
4. Anesketin, Dechra, Shrewsbury, UK
5. Ziapam, TVM Animal Health, France
6. Iso-Vet, Chanelle Pharma, Ireland

#### *Legends*

Figure 1. Approximately 1m of jejunum eviscerated through the abdominal defect.

Figure 2. 10cm diameter area of devitalised body wall with communication into the peritoneal cavity.

Figure 3. Maggots located within the body wall defect.

#### *References*

- Cotchin, E. (1977) A general survey of tumours in the horse. *Equine Vet. J.* **9** , 16-21.
- Freeman, D.E., Rotting, A.K., Inoue, O.J. (2002) Abdominal closure and complications. *Clin. Tech. Equine. Practice.* **1** , 174-187.
- GOV.UK. (n.d.). *The cascade: prescribing unauthorised medicines* . [online] Available at: <https://www.gov.uk/guidance/the-cascade-prescribing-unauthorised-medicines> (Accessed: 06/08/2022)
- Hann, M.J., Mair, T.S., Gardner, A., Mudge, M., Southwood, L.L., Dechant, J.E., Barton, M.H., Garcia-Macias, J., Parker, R.A., Hassel, D. and Archer, D.C., (2022) Acute abdominal dehiscence following laparotomy: A multicentre, international retrospective study. *Equine veterinary journal* , *54* (4), pp.719-725.
- Haspeslagh, M., Jordana Garcia, M., Vlamincx, L.E.M., et al. (2017) Topical use of 5% acyclovir cream for the treatment of occult and verrucous equine sarcoids: a double-blinded placebo-controlled study. *BMC. Vet. Res.* **13** , 296
- Hunt, R.J. and Boles, C.L. (1989) Postcastration eventration in eight horses (1982-1986). *Can. vet. J.* **30** , 961-963
- Hutchins, D.R. and Rawlings, R.J. (1972) Eventration as a sequel to castration of the horse. *Aust. vet. J.* **48** , 288-291.



- Knottenbelt, D.C. and Walker, J.A. (1994) Topical treatment of the equine sarcoid. *Equine Vet. Educ.* **6** , 72-75.
- Knottenbelt, D.C. and Kelly, D.F. (2000) The diagnosis and treatment of periorbital sarcoid in the horse: 445 cases from 1974 to 1999. *Vet. Ophthalmol.* **3** , 169-191.
- Knottenbelt, D.C., Patterson-Kane, J.C. and Snalune, K.L. (2015) Tumours of the skin. In *Equine Clinical Oncology*. pp 544-584.
- Marti, E.L.S., Antczak, D.F. and Gerber, H. (1993) Report of the first international workshop on equine sarcoid. *Equine Vet. J.* **25** , 397-407.
- Moll, H.D., Pelzer, K.D., Pleasant, R.S., et al. (1995) A survey of equine castration complications. *J. Equine. Vet. Sci.* **15** , 522-526.
- Murray, D. R., Ladds, P.W. and Campbell, R. S. F. (1978) Granulomatous and neoplastic diseases of the skin of horses. *Australian. Vet. J.***54** , 388-341.
- Netto, F.A.S., Hamilton, P., Rizoli, S.B., Nascimento Jr, B., Brenneman, F.D., Tien, H. and Tremblay, L.N., (2006) Traumatic abdominal wall hernia: epidemiology and clinical implications. *Journal of Trauma and Acute Care Surgery* , *61* (5), pp.1058-1061.
- Ragland, W.L., Keown, G.H. and Spencer, G.R. (1970) Equine sarcoid. *Equine Vet. J.* **2** , 2-11.
- Sullins, K.E., Roberts, S.M., Lavach, J.D. and Severin, G.A. (1986) Equine sarcoid. *Equine Practice* **8** , 21-27.
- Thomas, H.L., Zaruby, J.F., Smith, C.L. and Livesey, M.A. (1998) Postcastration eventration in 18 horses: the prognostic indicators for long-term survival (1985-1995). *Can. vet. J.* **39**, 764-768.
- Tulleners, E.P., Donawick, W.J. (1983) Secondary closure of infected abdominal incisions in horses and cattle. *J. Am. Vet. Med. Assoc.***182** , 1377-1379.
- van der Velden, M.A. (1988) Surgical treatment of acquired inguinal hernia in the horse: a review of 51 cases. *Equine vet. J.* **20**, 173-177.



