

Standing Surgery: Equine Skin Tumors

Timo Prange, Dr. med. vet., MS, DACVS

North Carolina State University

Raleigh, NC

Abstract

Skin diseases are one of the most important health problems in horses and the skin is the most common location for equine tumors. Equine sarcoids, melanomas and squamous cell carcinomas make up over 95% of equine cutaneous tumors, with the sarcoid being the most common form of skin cancer in horses. Identification of cases amenable to surgery in the field, the appropriate surgical techniques for different tumors and the use of adjuvant therapies following surgical removal of skin tumors are important for a successful outcome.

Sarcoids

The most important factor in the development of equine sarcoids appears to be an infection with bovine papillomavirus (BPV) type 1 and/or 2 (and, more recently, type 13). However, it is generally accepted that a BPV infection alone is not sufficient for neoplastic transformation. Genetic risk factors have been identified and Quarter Horses, Arabians and Appaloosas appear to be at a greater risk than Thoroughbreds, while Standardbreds are at a lower risk. Finally, sarcoids can develop at the site of any skin trauma (including lacerations, injections, insect bites), especially if the horse has sarcoids in other locations. It appears trauma does not only contribute to the neoplastic transformation, but also to the progression of the disease.

Diagnosis

The list of differential diagnoses for equine sarcoids is relatively long because of their very variable macroscopic appearance. To account for this, a system has been created that classifies sarcoids according to their gross appearance and clinical behavior. There are six clinically recognizable forms: occult, verrucose, nodular, fibroblastic, mixed, and malignant (malevolent). However, histological confirmation is often necessary (and highly recommended) to confidently diagnose an equine sarcoid. Because trauma can exacerbate the locally aggressive behavior of this tumor, a biopsy should only be taken if treatment is rapidly initiated after the diagnosis has been confirmed. A complete excisional biopsy should be considered whenever possible.

Treatment

The various clinical types of sarcoids require slightly different treatment regimens and many management protocols have been described – indicating that no single one is universally effective. Although a horse-owner favorite, “benign neglect” is only suitable for very few cases. Small, occult, or verrucous sarcoids that are not exposed to repeated trauma may be monitored, with the understanding that close observation is critical and removal mandatory if signs of deterioration are observed.

Surgical Excision: Conventional removal can be fast and effective if case selection is appropriate. If it is not, recurrence rates can be as high as 70% within 6 months. To maximize the chances of a successful surgical removal, only tumors that have a defined margin and are in a location where at least 12 mm of surrounding, healthy appearing skin can be excised, should

undergo surgery as a sole treatment. It is also important to minimize contamination of the wound bed with abnormal cells and ideally the wound is closed primarily.

Cryosurgery: In the absence of important underlying anatomical structures (nerves, significant vessels, synovial structures), three freeze-thaw cycles using liquid nitrogen at - 196°C can be an effective method in treating superficial lesions. It is also excellent as an adjunct therapy to surgery.

Laser Surgery: Success rates following excision with a CO₂, Nd:YAG or diode laser have been reported to be as high as 80%.

Intralesional Chemotherapy: Injections of cytotoxic drugs directly into the tumor are often used in equine skin tumors. However, their overall efficacy is limited and the need for repeated injections over prolonged periods can lead to client frustration and, subsequently, a lack of compliance. Drugs that are frequently used include 5-fluorouracil (5-FU), cisplatin and carboplatin. More recently, electrochemotherapy has been shown to be a very effective way of treating localized individual tumors, although the relatively expensive equipment and need for general anesthesia will likely limit its availability to referral practices.

Topical Immunotherapy: The topical application of 5% imiquimod (Aldara™) cream has resulted in excellent outcomes in horses with small sarcoids. The drug is described as an immune response modifier with anti-tumor properties, although its precise mechanism of action remains unclear.

Other treatments modalities for equine sarcoids are available and regularly used in equine practice, but in many cases, reports about their success rates and potential negative side effects are limited.

Melanomas/Melanocytic Neoplasms

Predominantly found in gray horses over 5 years of age, melanocytic neoplasms can be benign or malignant. In contrast to the equine sarcoid, there is no generally accepted clinical classification system for melanomas. One review proposes four distinguishable clinical syndromes: melanocytic nevus, discrete dermal melanoma, dermal melanomatosis and anaplastic malignant melanoma. Melanocytic nevi are found in young gray and non-gray horses in locations that would be considered “non-typical” for classic melanocytic tumors (legs, trunk, neck). They are histologically benign and respond well to complete surgical excision. Dermal melanomas are small discrete nodules found in gray horses with an average age of 13 years. Although often encountered at “typical sites” (perineum, tail base, sheath, etc.), they also exist in the “non-typical” locations. Dermal melanomatosis is histologically indistinguishable from dermal melanomas, but is clinically characterized by larger, confluent masses usually found in horses that are slightly older than the ones affected by discrete dermal melanomas (average age of 17 years). While surgical excision can be effective to resolve complications caused by larger masses, visceral metastases are likely. Although it is not entirely clear if multiple masses in one horse should be considered as metastatic or as multicentric separate neoplasms, there is much evidence suggesting a high rate of metastasis in dermal melanomatosis. Lastly, anaplastic malignant melanomas are found in gray and non-gray horses between the ages of 7 and 20 years and are characterized by aggressive local growth and metastatic dissemination.

Diagnosis

Biopsy is definitive, although appearance and location is often characteristic. Fine needle aspiration is a very helpful tool but does not reliably provide information about the malignancy.

Treatment

Benign neglect: This has been the “treatment of choice” for a long time, because of the presumed benign nature of melanomas in horses and their tendency to grow slowly. However, this can no longer be recommended. Tumors will only grow larger, have an increasing risk of malignancy, and become more difficult to treat. Early intervention is highly recommended.

Surgical removal: Especially in early, smaller lesions, surgical removal is very rewarding and typically uncomplicated. Even horses with larger, confluent lesions can be helped, although referral to a hospital is advisable in more complicated cases.

Cryosurgery: Using three freeze-thaw cycles, cryonecrosis can be achieved in tumors (with or without prior surgical debulking) found in locations where complete surgical excision is difficult (anal sphincter, undersurface of the tail, etc.). Cryosurgery is not suitable in locations where important underlying structures may be damaged by the treatment.

Intralesional chemotherapy (see earlier): Injection of single tumors with cisplatin has been reported to be effective and should be considered for tumors that are difficult to access, e.g. within the parotid salivary gland.

Oral cimetidine: Systemic administration of cimetidine at 2.5 mg/kg TID or 3.5 mg/kg BID or 7.5 mg/kg SID has anecdotally been successful, especially in fast growing melanomas, but the scientific evidence supporting this treatment is missing.

Vaccination: First reports of the use of a DNA vaccine to treat melanocytic tumors in horses are encouraging. The vaccine, Oncept®, is available for treatment of canine melanomas and encodes

human tyrosinase, which shares a 90% homology with equine tyrosinase. However, resolution or dramatic improvement of the condition should not be expected.

Squamous Cell Carcinoma

Squamous cell carcinomas (SCC) are locally aggressive tumors that can be found anywhere on the body but are most often encountered on the head and genitalia. Presenting as ulcerated, proliferative or destructive masses, they preferentially grow on non-pigmented skin or mucocutaneous junctions. There is increasing evidence that equine papillomavirus type 2 (EcPV2, *Equus caballus* papillomavirus type 2) plays a major role in the development of genital SCC in horses. Research is focusing on the potential role of smegma as a harbor for viral DNA and source of infection and on the development of a potent vaccine to prevent viral infection and tumor development. EcPV2 might also be involved in development of other equine SCC, although the common ocular masses are apparently not associated with papillomavirus infections.

Diagnosis

Impression smears can be diagnostic for ocular lesions, in most other cases a surgical biopsy is recommended.

Treatment

The appropriate management technique depends largely on location and size of the tumor, extent of tissue invasion and signs of metastasis.

Surgical removal: Complete removal with wide margins (e.g. partial phallectomy, enucleation, etc.) can carry a good prognosis as long as regional lymph nodes have not been invaded.

Typically, proliferative tumors carry a better prognosis than invasive/destructive lesions. Many of the surgical procedures for SCC removal can be carried out in the field, but good surgical planning is recommended, because the size of resulting skin defects and complications of their healing can be difficult to manage outside of a hospital.

Cryotherapy: The technique has been described earlier. Only very small and early lesions are likely to respond well to cryotherapy. It is a valuable adjunct treatment in cases where clean surgical margins may not have been achieved.

Intralesional chemotherapy (see earlier): Slow release forms of cisplatin (biodegradable beads, emulsions) and 5-FU with epinephrine are effective treatment tools, especially as adjunct treatments after surgical removal.

Topical cytotoxic/antimitotic drugs: Application of a 5% 5-FU cream twice daily for three weeks can successfully treat superficial lesions that are readily accessible. Superficial penile masses have responded favorably to twice-weekly applications of the cream. Very good results have been reported for the treatment of small ocular lesions with mitomycin C (alone or in combination with surgery).

Take Home Points

1. Client awareness is critical for early recognition of skin tumors.
2. The best outcome is achieved in lesions that are diagnosed early and treated aggressively.
3. Histopathology is critical for a definite diagnosis.
4. Melanomas in gray horses must not be ignored.

5. Metastases in horses with squamous cell carcinoma might be more common than previously assumed.

References/Suggested Reading

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