



# Clinical Case: Treatment for a Sarcoid in a Quarter-Mile Horse Using a Citric Extract Adsorbed to a Titanium Nano-Particles

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ARTICLE INFO	ABSTRACT
Published Online: 08 September 2022	In a quarter-mile horse, a tumor-like mass was presented on the left flank, with a diagnosis of sarcoid. At the beginning, cures were carried out twice a day with natural water, hydrogen peroxide and coumaphos with propoxur as mosquicide and larvicide, observing that there was no favorable regeneration of the tissue and after the surgical removal of the tumoral mass. Treatment with NANOCIT was initiated on the 16th after surgery, a spray with citrus extracts adsorbed to a titanium nanoparticles (NANOCIT) at 12 hours intervals for 15 days, treatment with NANOCIT promoted an abundant granulation tissue with a termination of the inflammatory process with good cicatrization.
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## INTRODUCTION

Sarcoids (meat-like) in equines were first diagnosed in 1936, nowadays it is considered a very common neoplasm, present in cutaneous tumour structures, frequent in horses sharing papillomas and sarcomas (Tuemmers-Apablaza and Quezada-Sandoval. 2018).

The presence of sarcoid in horses is associated with bovine papillomavirus infections. It is transmitted by direct or indirect contact. Papillomas are species-specific, however, the only case of cross-infection is between cattle and horses by bovine papillomavirus type 1 (BPV-1) and rarely type 2 (BPV-2), which cause the formation of fibroblastic tumours, known as sarcoids (Vindas B. et al. 2013). (Vindas B. et al. 2013).

Sarcoids are fibroblastic masses with a variable epithelial component. They are most commonly seen in animals aged 3-6 years, but the risk of sarcoids increases with age up to 15 years, with the risk decreasing thereafter.

They are commonly found in equines, donkeys and mules of all ages, breeds, sexes and coats, and the most frequent locations are:

- Extremities,
- Chest and trunk,
- Abdomen,
- Flanks and foreskin.
- Areas of the face (Valencia H, 2013)

The most predisposed breeds are Appaloosa, Arabian and Quarter Horse, this pathology can also occur in donkeys.

## Aetiology:

Studies using molecular techniques have provided strong evidence that bovine papillomavirus (BPV) or a closely related virus is the cause of sarcoid development in the horse (Robinson and Sprayberry, 2012).

Sarcoids can be classified according to their appearance:

- Type I: Warty and small,
- Type II: Fibroblastic,
- Type III: Mixed.
- Type IV: Also known as the "hidden form". This form usually appears around the eyelids and on the ears (Robinson and Sprayberry, 2012).

Susceptibility for the development of sarcoids has been associated with heritability of the W13 equine leukocyte antigen, a major histocompatibility complex class II allele. The relative risk for the development of sarcoid in horses with this allele is 2.76.

## Treatment

Different treatments are described for the management of equine sarcoid. Experience suggests that the best treatment for occult and verrucous sarcoids is to leave them alone. These types of sarcoids become more aggressive after biopsy. For fibroblastic sarcoids the treatment of choice is tumour reducing surgery with or without cryotherapy. Another relatively recent treatment is the use of cisplatin by intralesional injections.

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Other treatments include radiofrequency-induced hyperthermia, laser surgery, immunotherapy and acupuncture.

The most commonly used treatments include surgery, cryosurgery and cryotherapy, as well as topical and intralesional chemotherapy, radiotherapy and immunotherapy).

### Cryotherapy

Cryotherapy is a widely used method for the treatment of equine sarcoids. Its effectiveness rate ranges from 60-100%, this treatment should be performed by a veterinary practitioner with experience in the duration and depth of freezing. (Robinson and Sprayberry, 2012)

### Intralesional cisplatin

This treatment is based on an injectable oily emulsion (cisplatin), which has an 87% recurrence-free rate. The expected effect of administering the emulsion is to inhibit systemic concentrations of the pathogen and to prevent systemic toxic processes. Due to this. The emulsion maintains the therapeutic agent in constant tissue concentrations for a prolonged period of time. In this treatment it is recommended to administer epinephrine as a complement in the emulsion (1:1000 brought to a final volume of 1:10), to obtain as a result vasoconstriction, which prolongs the exposure of the cell to cisplatin.<sup>10</sup>

Administration of 1mg cisplatin/cm<sup>3</sup> tumour mass is recommended for at least 4 sessions (Robinson and Sprayberry, 2012).

## MATERIAL AND METHODS

### CASE REPORT AND TREATMENT

A male mongrel, intact, 10 years old. The data obtained from the clinical history showed a skin mass on the left flank, which had already been removed three times with negative results, as the mass developed again.

On 30 December 2018, the mass was surgically removed, and for the first fifteen days after the surgery, treatment was carried out twice a day with natural water, hydrogen peroxide and coumaphos with propoxur as a mosquito and larvicide, observing that there was no favourable regeneration of the tissue and until then it was decided to change the treatment.

From day 16 post-operative, the use of a citrus extract adsorbed on a titanium nanoparticle (NANOCIT) was applied by spraying. Upon application, a chemical reaction comparable to the reaction of hydrogen peroxide was observed. During the following 15 days NANOCIT continued to be applied to the wound, the granulation process was accelerated and the wound was "filled" with new healthy tissue.

It is worth mentioning that NANOCIT can cause irritation, leading to itching, which the equine seeks to avoid and hurts itself, which makes it advisable to administer an antihistamine. The whole process from inflammation to granulation of the wound lasted approximately 15 days and

the area is currently in the process of contraction and regeneration of the skin.



**Fig. 1:** 23 January 2018, recovery process 23 days after sarcoid removal.



**Fig. 2:** 05 February 2018, recovery process 36 days after sarcoid removal.



**Fig. 3:** 14 February 2018, day 45 post-operative.

## DISCUSSION

The definitive diagnosis of equine sarcoid is based on histopathological examination of biopsies (Van der Kolk & Veldhuis 2013). This technique is of vital diagnostic utility, as described by Reed et al. (2004). However, it must be considered that the extraction and taking of the biopsy can stimulate the growth and dissemination of the lesions if the manipulation is not correct, converting the sarcoid into other more active and proliferative tumour forms (Scott & Miller. 2011).

Sprayberry (2012), mentions that successful control for sarcoid is persistence, careful follow-up and repeat treatment as many times as necessary.

According to Marais & Page (2011), there is, as yet, no simple therapeutic approach that has been universally successful. Treatment of equine sarcoid is notoriously difficult, which is reflected in the variety of treatments available. Therefore, early intervention of the patient, interdisciplinary veterinary work (clinicians, surgeons, virologists, pathologists), the type, location and size of the sarcoid, as well as the correct combination of therapies must be considered (Vindas B. et al. 2013). This report presents the de novo use of an eco-sustainable treatment that corresponds to Nanomedicine applied to veterinary medicine. It is important to note that NANOCIT is not an antibiotic and its therapeutic effect in this case makes it worthy of mention.

## CONCLUSIÓN

The use of citrus extracts adsorbed on titanium nanoparticles (NANOCIT) favours healing and non-proliferation of the equine sarcoid, as well as preventing infections by other microorganisms in the affected area. With NANOCIT, effective healing was observed without growth or dissemination of the medicated sarcoid.

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