How to Prepare and Inject Cisplatin in Oily Emulsion to Treat Equine Sarcoids and Squamous Cell Carcinomas

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Cisplatin in oily emulsion can easily be injected into sarcoids and squamous cell carcinomas. The success rate in treating these tumors in this fashion is between 65–90%. The method of preparation and injection is described. Authors' address: Dept. of Clinical Sciences, Cornell University, College of Veterinary Medicine, Ithaca, New York 14850. © 2000 AAEP.

Introduction

Sarcoids and squamous cell carcinomas are the two most commonly diagnosed tumors in the horse. Treatment modalities described include surgical excision, cryotherapy, laser photo vaporization, immunotherapy, hyperthermia, and radiotherapy. These treatments have variable results, require specialized training, and have not routinely been used in practice. Cisplatin is an active cytotoxic drug that has excellent efficacy against a variety of tumors. However, it has a narrow therapeutic range, and its systemic use has been associated with substantial nephrotoxicity, neurotoxicity, and gastrointestinal toxicity.1

The efficacy of intratumoral injections of cisplatin in oily emulsion to treat sarcoids and squamous cell carcinomas in the horse has been reported to be 87% and 65%, respectively.2 Furthermore, the perioperative use of cisplatin in oily emulsion was shown to be safe, cause minimal local wound toxicosis, and had no effect on wound healing of surgical incisions.3 The purpose of this paper is to describe the technique of preparing cisplatin in an oily emulsion and injecting it into cutaneous tumors in the horse.

Materials and Methods

The materials needed include cisplatin,6 sterile water, medical-grade sesame oil,10 two 12-cc Luer lock syringes; a short extension set with a Luer lock attachment; a 3-way stopcock; several 23-gauge needles; and eye, hand, and body protection. Materials to perform a local block may also be needed depending on the location and size of the tumor. Medical-grade sesame oil is passed through a .22 micron filter to ensure sterility.

The hair surrounding the tumor should be clipped to ensure proper infiltration of emulsion around the tumor. The tumor is measured and numbers recorded to adequately assess regression upon reassessment (Fig. 1). It is then aseptically prepared in standard fashion to ensure that no bacteria will be injected into the tumor or subcutaneous tissue. If necessary the horse may require sedation and local infiltration of anesthetic to facilitate injection of the tumor (Fig. 2).
One ml of sterile water is drawn up and injected into the vial of cisplatin (10 mg). The bottle can be shaken by hand to mix the drug into a homogenous liquid. The homogenous liquid is drawn into one of the Luer lock syringes. Two ml of sesame oil is drawn into the other Luer lock syringe. Both syringes are attached to the three-way stopcock and the off valve turned towards the third port (Fig. 3). With each hand on a syringe, the syringe contents are mixed with one another by passing the oil and cisplatin back and forth through the stopcock for approximately 1 min (Fig. 4). When the oily emulsion seems to be a yellow homogenous and viscous fluid, it is ready to inject. Based on a study previously performed, this formulation of cisplatin (3.3 mg of cisplatin/ml of emulsion) is the most stable and will not separate into 2 phases (i.e., lipid and water) over a 3-hour period. Hand, eye, and body protection should be worn when preparing this emulsion.

All the emulsion is drawn up into one syringe and the stopcock is removed from the syringes. The short extension set is attached to the syringe and a 23-gauge needle is attached to the extension set (Fig. 5). Having a Luer lock attachment at each connection inhibits detachment of any section of syringe, extension set, and needle while injecting. The tumor should then be injected using sterile injection techniques and the tumor and surrounding tissue within 1 cm of tumor should be infiltrated with emulsion. The tissue can be infiltrated while the needle is withdrawn (Fig. 6). For large, deep tumors, multiple tissue planes are required. Adequate infiltration of tissue should result in 1 mg of cisplatin/cm³ of tumor, and volume of emulsion injected depends on the size of the tumor. If the tumor is large, multiple planes of injec-

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Fig. 1. Accurate measurement of the tumor is essential for assessing regression.

Fig. 2. Sedation and local infiltration of anesthetic may be necessary to facilitate the injection of cisplatin.

Fig. 3. The cisplatin-filled syringe and the sesame oil-filled syringe are connected to the three-way stopcock.

Fig. 4. Syringe contents are mixed with one another for approximately 1 minute.
tion may be required for complete infiltration of tissue.

Disposal of materials used should follow the guidelines of Occupational Safety and Health Administration4,5 and the physician package insert. Additionally, owners and anyone in contact with the horses should be informed of the potential risks of direct contact with the treated area.

Injections of the cisplatin and sesame oil emulsion should be performed in a similar manner every two weeks until all clinical evidence of neoplasia completely disappear. Following resolution the area should be examined monthly for evidence of recurrence.

Results

We have treated many horses with sarcoids and squamous cell carcinomas using this method of treatment and have had similar success rates to published reports.2 Often we combine surgical debridement with laser or scalpel with this treatment in order to lessen the number of times of injection as well as minimize cost involved with treatment and transport. This is not always necessary however, and in areas such as the eyelids, ears, genitalia, and tumors over joints and tendon sheaths, surgical debulking may be prohibited. Numbers of reinjections depends upon size of the tumor; however, it is typical to inject a 5-cm tumor 2–3 times at two-week intervals. This number can vary however. We do not typically use antibiotics peri-injection; however, tetanus prophylaxis should be ensured.

Discussion

This technique of treatment of sarcoids and squamous cell carcinomas is easy, feasible, and does not require sophisticated treatment or training. In areas where surgical removal and debridement may be impossible this treatment results in sparing structures proximating the tumor (eyes, joint capsules, and tendon sheaths). Furthermore, cosmetic results may be more desirable since white hairs from procedures such as cryotherapy do not replace pigmented hairs. We believe it is important to follow up treatments at two-week intervals since occasional failures seem to occur when time lapses between treatments. If owners agree to this treatment they must also commit to these follow-up treatments and rechecks to ensure a positive outcome. We have not experienced any clinical evidence of systemic or local wound toxicosis to this treatment. As of this writing, cisplatin in the lyophilized form is readily available to practitioners.

References and Footnotes


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