TREATMENT OF A NASAL ULCER IN A BLACK RHINOCEROS (*Diceros bicornis*) USING CRYOSURGERY

R. Eric Miller, DVM, Dipl ACZM* and Randall E. Junge, MS, DVM, Dipl ACZM

Endangered Species Research Center and Veterinary Hospital, Saint Louis Zoological Park, St. Louis, MO 63110-1396 USA

Abstract

Case Report

A 22-yr-old female eastern black rhinoceros (*Diceros bicornis michaeli*) was presented for a hemorrhagic ulcer on the rostral-medial edge of its left nostril. The rhinoceros' past medical history included previous episodes of mucocutaneous ulcers, heavy accumulations of tartar that resulted in the removal of several molars and premolars, chronic diarrhea (after negative evaluations for common causes of diarrhea, presumably due in part to maldigestion secondary to the oral lesions), a digital abscess, and a cranial horn avulsion. The animal had been vaccinated annually for leptospirosis (Leptoferm-5, SmithKline Beecham, West Chester, PA 19380 USA). A previous, mild nasal hemorrhage that presented 5 yr before this episode, had spontaneously resolved.

Seventy-two hours after presentation, the rhinoceros was anesthetized with 4 mg etorphine (Etorphine, Wildlife Laboratories, Fort Collins, CO 80524 USA) and 100 mg xylazine (Xyla-ject, Phoenix Pharmaceuticals, St. Joseph, MO 66504 USA). The animal was recumbent in15 min, and blood was collected from the medial carpal vein for a CBC, serum chemistry profile, and for various research protocols. Examination revealed a 3 × 8 cm ulcer with a raised border and raw, bleeding surface in the left nares and a 5 cm by 10 cm ulcer inside the upper right lip margin. Bronchoscopy 30 cm into the nasal passage revealed blood draining from the ulcer, but no additional ulcers or masses. Punch and wedge biopsies were collected from the margins of both the nasal and oral ulcer. The hematocrit was 43.8% and there was a mild increase in the white blood cell count (17,800/ml) with a mature neutrophilia. Histologic findings were compatible with the superficial necrolytic dermatopathy syndrome (formerly called mucocutaneous ulcerative syndrome by some) of captive black rhinoceroses.[1,2]

Over the subsequent 3 wk, the ulcer continued to hemorrhage. The rhinoceros was again anesthetized, and although repeat nasal endoscopy revealed no additional lesions, the ulcer now extended 13-14 cm up the nasal passageway. The rostral portion of the ulcer was cauterized with a carbon dioxide laser, and the caudal-most aspects of the lesion that could not be reached by the laser were treated with electrocautery. The hematocrit on blood collected from the medial carpal vein was 38.7%.

Four days later, significant hemorrhage was noted. Blood collected from an ear vein, revealed a hematocrit of 24%. In an attempt to control the hemorrhage, 1:25,000 epinephrine solution was sprayed onto the ulcerated area. However, marked hemorrhage continued overnight. The rhinoceros was anesthetized the following morning. The hematocrit (from the medial carpal vein) was 32.4%, and the WBC was again moderately elevated. A clotting profile was as follows: PT = 14.1 sec, PTT = 23.9 sec, and 288,000 platelets/ml. The nasal ulcer was more proliferative and there was a notable deficit ("cratered area") in the caudal aspect of the lesion. Liquid nitrogen , applied with sterile gauze sponges, was used to freeze as much of the ulcer as possible. At the end of the procedure there was only mild hemorrhage and it was controlled with topical 1:10,000 epinephrine. Upon reversal, the animal sneezed violently and rubbed its nose on the floor, re-initiating the hemorrhage. However, it quickly subsided when again treated with topical 1:25,000 epinephrine. Due to decreased hemorrhage, the epinephrine was discontinued the following day.

In the subsequent 5 days, only occasional drops of blood were noted and the ulcer became notably smaller and drier in appearance. Serial hematocrits drawn from the ear vein ranged from 25.7-27%. On day 5, the cranial portion of the lesion was dry in appearance, and the internal affected mucous membranes were white, dry and delineated by a sharp margin. In the subsequent 4 wk the lesion completely resolved and only a small white scar remains. During this period, the hematocrit (from the ear vein) increased to 31.4%.

Discussion

The syndrome of superficial necrolytic dermatopathy has been reported as the most common disease of captive black rhinoceroses in North America.[2,3] As in this case, ulcerative lesions, and sometimes proliferative lesions can be found on the skin, often starting over points of wear, and the mucous membranes of the oral and nasal cavities. Frequently the lesions recur.

Although most cases, particularly the milder forms, appear to spontaneously resolve, some do not. Various empirical treatments have been suggested (including topical and systemic antibiotics for secondary infections),[3] however, no single treatment has consistently caused a reversal of the lesions.[1,2] Biopsies are important in order to determine that the lesions are indeed representative of the superficial necrolytic dermatopathy, and not other ulcerative skin lesions of black rhinoceroses.[2] Additionally, biopsies should be performed so that neoplastic disease such as fibrosarcoma or squamous carcinoma can be ruled out.

A remarkable feature of the ulcer in this case was the significant blood loss apparent both in the frank hemorrhage and in the hematocrit values. A notable difference between the hematocrit of ear vein samples from awake rhinoceroses and that of samples collected from the medial carpal vein of anesthetized animals was also noted and is similar to the findings of the others (M. Miller, personal communication).

In this rhinoceros, attempts to cauterize the lesion with laser therapy appeared to exacerbate the hemorrhage. Cryosurgical techniques produced a quick, effective resolution of the ulcerative

lesions. In general, the use of cryosurgery is limited in part by the ability to control its application (i.e., not freezing vital underlying anatomic structures). In this case, it was fortunate that the ulcerative lesion was along the nasal septum, and not adjacent to important nerves, vessels or tendons. On the basis of this single treatment, laser therapy should not be ruled out for future cases. However, given the results from this case, cryosurgery appears to be a potentially valuable therapy for the treatment of future ulcerative lesions that significantly compromise the overall health of a rhinoceros.

ACKNOWLEDGMENTS

The authors wish to acknowledge the assistance of Drs. John Payne and David Wilson from the University of Missouri College of Veterinary Medicine.

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