

A CLINICAL NOTE ON THE VASCULAR ANATOMY OF THE BLACK RHINOCEROS (*DICEROS BICORNIS*) FORELIMB

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Abstract: This report describes the location and use of a large medial foreleg vein (radial vein) for the collection of large (up to 1 L) volumes of blood from the black rhinoceros (*Diceros bicornis*).

Key words: Black rhinoceros, *Diceros bicornis*, blood collection, venous anatomy.

INTRODUCTION

In the black rhinoceros (*Diceros bicornis*), the ear vein has been the most frequently recommended venipuncture site.^{4–6} However, it may prove inadequate in cold or shocky animals, or when large volumes of blood are required. This report describes the location of the radial and associated medial forelimb veins as seen on anatomical specimens and offers these veins as an alternative venipuncture site in anesthetized black rhinoceroses.

ANATOMICAL DISSECTION

The following description represents the summary study of three forelimbs obtained as necropsy specimens from two female black rhinoceroses (6 mo and 2 yr of age). The limbs were injected with latex media, radiographed, and dissected. The venous complex is illustrated in Figure 1 in relation to palpable osseous structures. The cephalic vein (a) and the radial vein (b) anastomose on the caudomedial aspect of the carpus at the level of the palpable styloid process of the distal end of the radius and the radial carpal bone. The superficially located cephalic vein (a) continues dorsal on the medial side of the radius and reaches the dorsal aspect of the forelimb at the level of the elbow joint. The radial vein (b) penetrates between the flexor muscle tendons proximal

to the proximal edges of the carpal bones. The radial vein is formed by confluence of the superficial (c) and palmar (deep) (d) branches of the radial vein distal to the cephalic vein. The bracket (X) indicates the portion of the radial vein that is superficial and most accessible for venipuncture. At that point, it lies in a groove caudal to the palpable portion of the radius.

DISCUSSION

Finding superficial veins in the black rhinoceros for venipuncture may be difficult because of the thick and nonsupple skin. The vascular anatomy of the black rhinoceros forelimb has not been described in several historical anatomical reviews.^{1–3} In adult black rhinoceroses at the St. Louis Zoological Park, the radial vein could not be seen grossly. However, application of a broad tourniquet around the antibrachium distal to the elbow produced dilation of the cephalic, radial, and distal veins, and the site of venipuncture could be determined by palpation. The radial vein was generally cannulated with a 14-gauge needle with attached blood collection tubing. Venipuncture at this site in three adult and two juvenile (6 and 7 mo) black rhinoceroses successfully collected large (300–1,000 ml) quantities of blood on 10 occasions when it was attempted. Additionally, the technique has been successfully employed on anesthetized black rhinoceroses during a translocation project in Kenya (S. Kerr, pers. comm.). Failure of the technique was noted in an adult suffering a hemolytic crisis (Hct = 7%) at another zoo; but in that case, pe-

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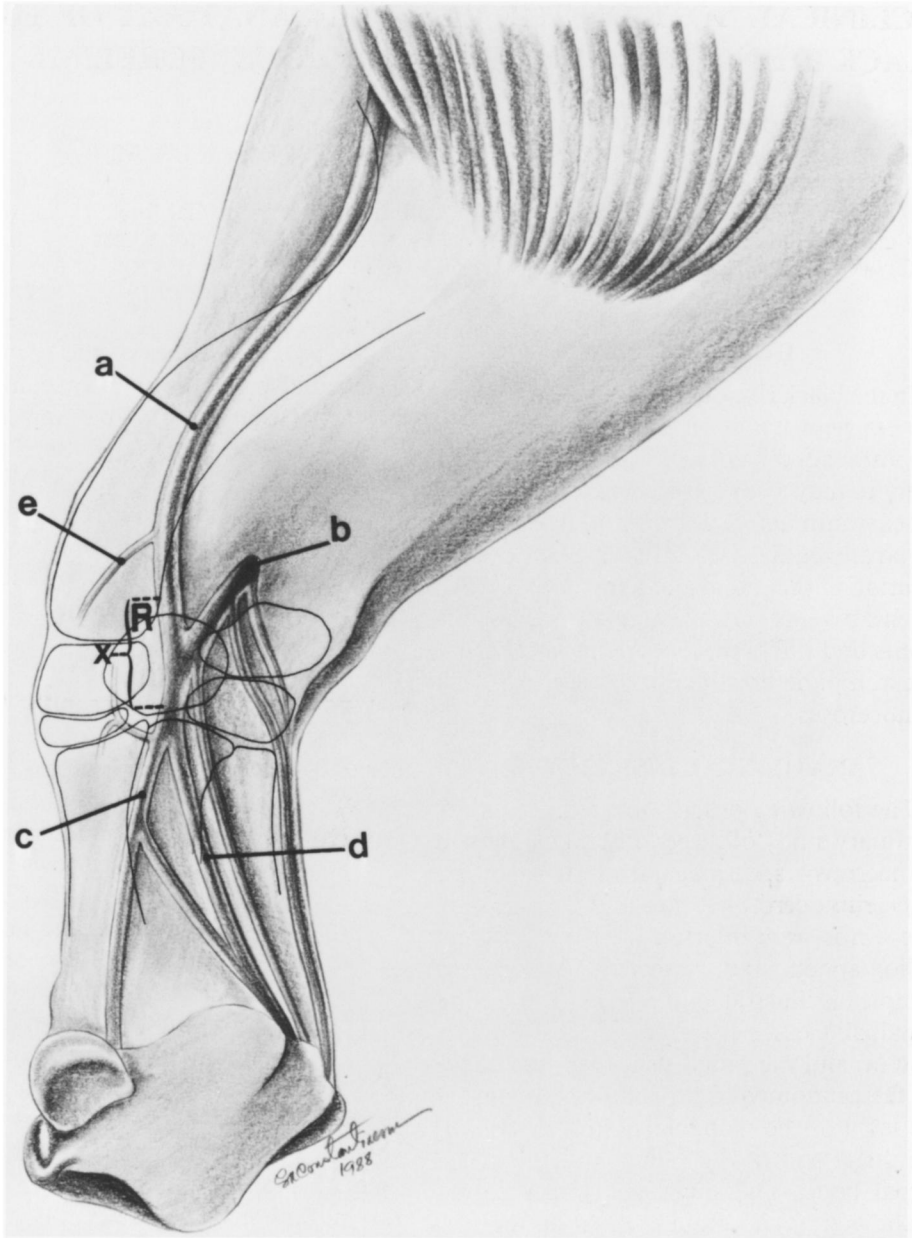


Figure 1. Medial view of the right forelimb of a black rhinoceros. The bones and veins are outlined as follows: cephalic vein (a), radial vein (b), superficial branches of the radial vein (c), palmar (deep) branch of the radial vein (d), accessory cephalic vein (e), distal medial aspect of the radius bone (R), and suggested site for venipuncture (X).

ripheral vascular collapse presumably contributed to the failure of the procedure.

In view of the multiple studies of hematology, clinical pathology, and nutrition underway in captive and wild black rhinoceroses, the description in this report of an additional blood collection site should aid the clinical veterinarian in obtaining blood from this species.

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BOOK REVIEW

Field Guide to Wildlife Diseases: General Field Procedures and Diseases of Migratory Birds, Milton Friend (ed.). U.S. Department of the Interior, Fish and Wildlife Service, Resource Publication 167, Madison, Wisconsin, USA. 1988. 225 pages, 204 illustrations. Price: \$16.00.

The photographs and information contained in this book are well suited for the wildlife biologist or college level student. In particular, the color plates and life cycle drawings convey the basic concepts of disease processes and diagnostic procedures and the vivid realities of managing and cleaning up disease outbreaks in wild birds. The format is similar to reference texts and is standardized (synonyms, cause, species, distribution, seasonality, field signs, lesions, diagnosis, control, human health, and reading list). The *Field Guide* is clearly and simply written. This is not, however, a text book; it is a field guide. It is not exhaustively referenced and some oversimplification is present. The difficulty in making a diagnosis and in differentiating between several waterfowl diseases could use more emphasis to discourage picture book diagnostics. The quality of the printing and binding is excellent. The price is almost unbelievable at \$16.00 per manual. This is the kind of book state and federal agencies can and should purchase for field employees and universities should encourage students to buy.

Some notable diseases of raptors (trichomoniasis, herpes virus) and cranes (systemic coccidiosis, mycotoxicosis) have been left out. Avian influenza and pesticide intoxication of waterfowl and raptors are important migratory bird disease problems that also are not addressed. If this book is published again, more collaboration with wildlife disease experts outside the staff of the National Wildlife Health Research Center at Madison, Wisconsin, would result in a more complete coverage of the subject.

Such practical but often ignored subjects as euthanasia, carcass disposal, record keeping, and specimen collection and shipment are well handled. One can only hope that all students and biologists read, digest, and remember these portions of the text. Several of the appendices (Sample History, Supply Sources) contain the practical information needed by biologists. The mammal dissection illustrations seem out of place in a book devoted to avian diseases and their management.

I highly recommend the purchase of several copies of this book and look forward to the promised two or three field guides (on other wildlife disease topics) to follow.—Reviewed by **David A. Jessup, D.V.M., M.P.V.M.**, California Department of Fish and Game, Wildlife Management Division, Wildlife Investigations Laboratory, 1701 Nimbus Road, Suite D, Rancho Cordova, California 95670, USA.