

CLINICAL NOTE: BLOOD SAMPLING OF CAPTIVE SHARKS

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Introduction

The diagnosis and therapy of diseases in nondomestic species are based upon the ability to observe and understand behavioral and physiological changes. Alterations in blood parameters are extremely useful tools in this process. They are correlated with a wide spectrum of disorders in many species and the only major requirement for establishing these correlations is the ability to routinely obtain reliable samples. This presents little problem for veterinarians working on terrestrial mammals with familiar body configurations if appropriate restraint is available. This is not true of less familiar creatures such as sharks which can pose a significant obstacle to obtaining a blood sample for the uninitiated clinician.

This paper is a basic description of how and where to obtain reliable venous samples from sharks for clinical work. Although shark blood has been obtained through surgical approaches in numerous studies, simple venipuncture techniques are not well described in the available literature. The method presented in this paper is the result of several anatomical dissections by the authors in our own quest for a sampling site. It is easy to learn and has been taught to and used successfully by several investigators in a variety of shark species.

Materials and Methods

The most easily accessible vein in the conscious shark lies along the midline just ventral to the vertebral bodies. It is encased in a protective sheath of cartilage. It is most easily located by using the posterior base of the caudal fin as a landmark. If this fin is stretched ventrally, away from the body it pulls two small furrows of skin at its posterior attachment. A needle placed between these furrows at the base of the fin and directed anterior and dorsad at a 30 degree angle from true vertical will intersect the vein (Figure 1). The cartilage wall provides an excellent tactile indicator of successful venipuncture.

A needle 1.5 inches long is adequate for reaching the veins of most sharks weighing up to 100 kg. The sawfish is a notable exception, requiring a proportionally longer needle than other sharks. Twenty-two gauge is suitable for small specimens, but 18 gauge is more appropriate for tough-skinned large animals which may also require directing the needle closer to vertical.

The most frequent cause for failure to obtain a sample is deviation from the midline during the puncture. Vigorous insertion of the needle can also cause failure if the cartilage wall is not felt and the needle pushed through the vein to the ventral vertebral body. In this situation merely backing the needle is enough to get a sample. Another cause for a dry puncture is extreme elevation of the tail to facilitate manipulation. The cardiovascular system of the shark is based upon a two-chambered heart and relies heavily upon gravity and peripheral muscular contraction for venous return. Bringing the tail below the level of the heart facilitates the procedure.

Clotting does not present a major problem, and use of a heparinized syringe is not usually necessary. Both sodium heparin and sodium EDTA are suitable as anticoagulants, but shark leukocytes are particularly fragile and smears should be made immediately, dried and fixed to avoid

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large numbers of smudge cells. This vein is suitable for catheterization and infusion of drugs and solutions.

