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TECHNIQUES FOR OBTAINING BLOOD SAMPLES FROM THE GOLDEN HAMSTER[1]

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Investigations in this laboratory indicated a need for procuring sufficent blood from the golden hamster at 3- or 4-week intervals for red and white total blood cell counts, blood smears for differential counts, and samples for hemaglobin determinations. Examination of the circulatory system of the hamster and study of the literature resulted in the decision to compare three methods of procuring blood samples with respect to (1) time required, (2) amount of blood obtainable and (3) facility of operation. Although all three methods can be employed on the conscious animal, it was decided to anesthetize the animals to prevent pain and possible injury due to struggling.

The first method is to procure blood from the incisor branch of the alveolaris inferior vein, which lies rather superficially between the upper portions of the roots of the lower incisors. Each animal was anesthetized by intraperitoneal injection of 0.25 cc. sodium pentobarbital (veterinary nembutal, 50 mg. per cc., Abbotts). A mouth prop device designed by Johansen[2] (1952) (fig. 1) holds the jaws open securely and permits access to the blood vessel with a number-27 hypodermic needle attached to a tuberculin syringe. The syringe was filled with a 2 percent solution of sodium oxalate (anticoagulant), which was expelled just before making the puncture. The saliva, which accelerates coagulation, was absorbed from the area around the puncture by placing a narrow strip of cotton just below the exterior surface of the lower incisors and inside the nether lip. Striking the incisor branch of the alveolaris inferior vein is difficult. The syringe must be held steady and the needle introduced carefully just under the surface of the gums between the lower incisors at a point about 0.5 mm. below the lower limits of the exposed teeth. The first small

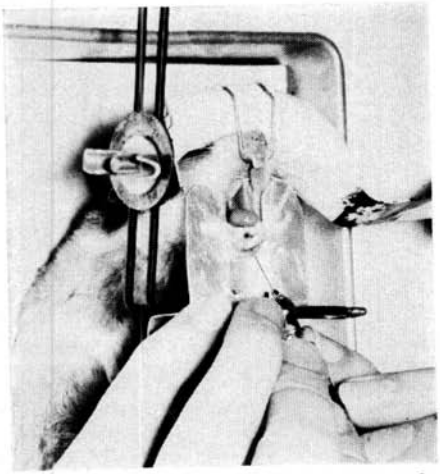

FIG. 1.—Puncture of the incisor branch of the alveolaris inferior vein using Johansen's mouth prop device.

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drop of blood from the syringe was discarded, and the remainder of the sample (0.25 cc.) placed on a clean, smooth surface such as the bottom of a petri dish or a paraffin surface. After blood samples were obtained, the animals were immediately released from the mouth prop device, and no adverse effects were observed in them. However, the procedure is time-consuming, and the technique very difficult to master. Twelve hamsters were used.

The second method is to obtain blood by heart puncture, similar to the method of Sullivan and Everett (1952), using a number-26 hypodermic needle attached to a 2 cc. Luer hypodermic syringe. Each animal was anesthetized by injecting intraperitoneally 0.25 cc. sodium pentobarbital and then fastened securely, ventral surface uppermost, to a small animal operating table. With the third and fourth fingers of the left hand pressing firmly against the ribs on the right side of the animal to hold the heart sinistrad, the heart beat was located by palpation. Holding the syringe in the right hand the needle was inserted through the chest wall and into the heart at a point 14 mm. craniad and 11 mm. to the left of the caudal end of the sternum. Twenty-five hundredths cc. (0.25 cc.) of blood was drawn slowly into the syringe, which had previously been rinsed with 2 percent sodium oxalate. Twelve hamsters were used.

In the third method, hamsters were anesthetized with ether and their tails cut to obtain blood, using a technique similar to that reported by Stein and Carrier (1945). A maximum of 15 cuts are possible on the average adult hamster's tail, which is from 18 to 20 mm. long. A sample of 0.25 cc. was drawn into a 5.020 cc. volumetric pipette which had been previously rinsed with 2 percent sodium oxalate, and deposited on a clean paraffin surface, from which the required amount was taken for the various observations. Twenty-four hamsters were used in the study of this method.

Of the three methods, the first is the most difficult and requires considerable practice. It is also the most time-consuming, because of the difficulties in introducing the needle precisely into the lumen of the vein and holding it steady while the blood is taken. As much as 2 cc. of blood can be withdrawn by this method without seriously incapacitating the animal (total blood volume of hamsters weighing 100 to 140 grams ranges from 4.5 cc. to 6.0 cc.).

The heart puncture method requires less time, is fairly easy, and also yields plenty of blood for the usual hematological studies. The disadvantages of this method are the high degree of shock and the danger of blood clots forming in the heart as the result of introducing small amounts of air when the puncture is made.

The tail-cutting method is by far the simplest to perform. Although the short tail limits the number of amputations and precautions must be taken against infection of the exposed injured surface, adequate quantities for the usual blood studies are easily obtained and the animal can be returned to its cage in a matter of minutes with only a low degree of shock.

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