

A technique for collecting postcaval venous blood samples from mice

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Introduction

Several methods for collecting blood from mice have been reported.¹⁻¹⁰⁾ The methods generally used to collect blood present several difficulties, including variation in the volume of blood obtained, need for anesthesia with cardiac puncture,¹⁾ and often insufficient quantity of blood when obtained by the conventional method of snipping off the tail with scissors²⁾. Puncture of the orbital venous plexus is of course an excellent method for bleeding mice.^{3,4)}; however, in addition to the danger of causing eye damage, a certain amount of dexterity or assistance in holding the animal is required if anesthesia is to be avoided. Tanaka *et al.* (1979) reported the method of blood collection from postcaval vein of mice and rats.⁵⁾ However, they did not describe in detail the technique of blood collection in mice. Thus, a more convenient and surer method for collecting blood in volume sufficient for clinico-chemical examinations was developed by the present authors. Accordingly, we report the practical technique for collecting postcaval venous blood samples from mice.

Materials and Methods

This technique consists of 5 main steps:

- 1) anesthetization of the mouse;
- 2) immobilization;
- 3) sectioning of the abdomen;

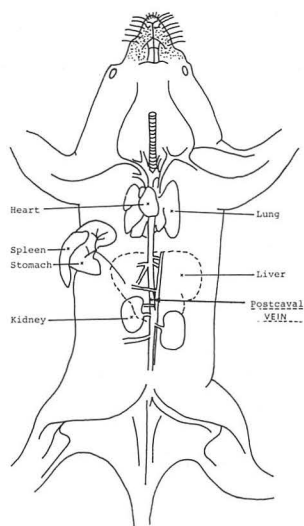


Fig.1. Illustration of the main circulatory system of the mouse.

- 4) identification of the postcaval vein;
- 5) puncturing of the postcaval vein for blood collection.

The mice were males of the ddY strain, each weighing 25–35g. Each mouse was lightly anesthetized by intraperitoneal injection of sodium pentobarbital (25.6mg/kg). For immobilization, the paws were fixed on the board. After sectioning the abdomen with scissors, the postcaval vein is easily identified as it is the biggest vessel in the retroperitoneal (Fig. 1). Puncturing the vessel in the usual fashion, the blood was collected by means of a 1-ml disposable syringe (Terumo Co Ltd, Tokyo, Japan) equipped with a 26 1/2-gauge needle.

Results and Discussion

The authors have collected blood from more than 500 mice using this method. This mouse-bleeding technique has several advantages over the other methods. In contrast to cardiac puncture, the procedure demands no special skill and does not result in the accidental death of valuable experimental animals before sufficient blood has been obtained. Moreover, it is a quick method, with less than 5 minutes being required to obtain a sample. In addition, the inexperienced researcher, after only a few practice trials, can readily puncture the postcaval vein and collect 0.85 ml of blood more than 90% of the time. Furthermore, the blood is clean and not contaminated with tissue fluid. The serum obtained by this method was rarely hemolyzed. Samples collected by this technique are mostly suitable for clinico-chemical examinations.

The method does have disadvantages, including the need for anesthetization and sectioning of the abdomen of the mouse, especially burdensome in the case of blood collection from a weakened mouse.

Nonetheless, it is certainly easier and safer for the inexperienced researcher. All things considered, the postcaval venous method of blood collection should prove to be a valuable, practical substitute for the methods presently in use.

Summary

A present technique is described for collecting blood samples from mice. Blood is obtained from a postcaval vein by means of a 1-ml disposable syringe equipped with a 26 1/2-gauge needle. The authors have collected blood from more than 90% of the cases samples of 0.85 ml could be collected. Samples sufficient for clinico-chemical examinations may be readily obtained by this method without hemolysis. The technique is rapid, reliable, and requires no special training.

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マウスの下大静脈からの採血法の検討

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概 要

マウスから採血する方法については、これまで多くの報告がある。そのいずれの方法もいくつかの問題点を抱えている。今回報告する下大静脈からの全採血法については、過去にいくつかの簡単な報告がみられる。しかし、いずれもマウスでの採血手技、採血条件および採血成績については十分な記載がなされていない。以上のようなことから、マウスの下大静脈からの全採血の方法について検討した。

まず、ペントバルビタールソーダを腹腔内に投与することによってマウスを麻酔した後、外科用ハサミで腹部を切開する。次に、腹部諸臓器を指で横に押しやり、後腹膜の中央の上下を走る血管の中でも最も太い下大静脈を確認する。直ちにディスプレイ注射器(26 1/2ゲージ, 1 ml容)を用いて常法に従い血管を穿刺し採血を行う。この方法を500匹以上のマウスに試みた結果、実験に供した90%以上のマウスから0.85ml以上の血液を得ることができた。比較的多量の血液を効率よく得ることができるばかりでなく、得られた血液にはほとんど溶血は認められなかった。このことは、本採血法で得られた血液は、一般に溶血が禁忌とされる血清臨床化学的検査のための試料としても十分使用できるものと思われる。この方法の特徴は、動物の固定、麻酔、および採血手技のいずれにおいても特殊な技術を要することなく、迅速にしかも高確率で採血を完了することができることである。さらに、他の採血法で得られた血液に比して組織液などによる汚染も少なく、比較的清浄な血液を得ることができる。