

Usefulness of ultrasonic two-way Doppler flow detector in percutaneous arterial puncture in patients with hemorrhagic shock

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To the editor: In patients with hemorrhagic shock, the radial artery pulse is difficult to palpate, and difficulties may be encountered in percutaneous arterial puncture. In this letter,

we describe a method of easy access to the artery using an ultrasonic two-way Doppler flow detector (HD-307, Nihon Kodan, Tokyo, Japan) (Fig. 1A) [1,2].

The arterial puncture procedure (Fig. 1B) is performed as follows:

1. As with conventional arterial puncture, place a pillow under the dorsum of the hand and extend the wrist.
2. Identify the arterial pulse using the probe tip.
3. Use an office clip to mark the position of the strongest pulse sound.
4. Mark a point distal and a point proximal along the course of the artery.
5. Disinfect the puncture site with alcohol.
6. Relying on the markings, perform the puncture without palpating the artery.

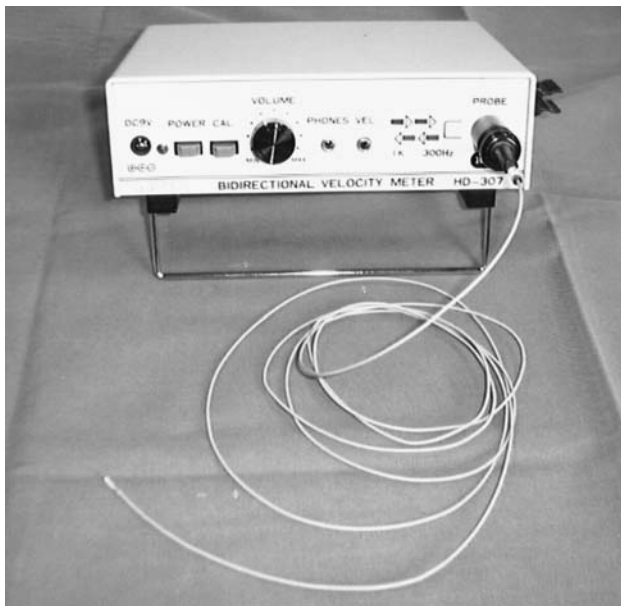


Fig. 1. A The ultrasonic two-way Doppler flow detector incorporated with a minute probe tip with a diameter of 2 mm. **B** Marking the position for arterial puncture using an office clip and the flow detector

We report two recent cases of hemorrhagic shock in which radial arterial cannulation was successfully installed using these methods.

Case 1. A 54-year-old man with an estimated height and weight of about 170 cm and 80 kg, respectively, was diagnosed as having hepatic vein rupture and head trauma due to a traffic accident while driving a compact car. On arrival by ambulance, he was in a state of shock and unconscious. The patient had low blood pressure and, in addition, his wrist was exceptionally stout and the radial arterial pulse was not palpable. Palpation of the brachial area barely detected a systolic blood pressure of 60 mmHg. In the operating room, the arterial puncture procedure described earlier was performed and left radial arterial cannulation was secured by a single puncture.

Case 2. A 45 year-old female employee in a slipper factory, 160 cm in height and weighing 50 kg, had her right upper arm caught in a large rotating machine and her whole body was rotated about ten times. Her right upper arm was amputated and both lower extremities were fractured. On arrival by ambulance, she was in a state of shock and did not respond to verbal command. The left radial artery pulse was not palpable. Palpation of the brachial area detected a systolic blood pressure of 70 mmHg. In the operating room, the Board certified anesthesiologist made several attempts at left radial arterial puncture but failed. The author then took over, performed the

described arterial puncture procedure, and succeeded in arterial cannulation in one attempt.

Securing radial arterial cannulation is an important clinical technique. The necessity of the arterial line is even greater in situations such as shock. Paradoxically, however, installation of arterial cannulation is usually difficult in such cases. Yet the ability of the anesthesiologist to successfully insert radial arterial cannulation simply and safely has an important effect on subsequent anesthetic management. The success of securing radial arterial cannulation in two difficult cases by using an ultrasonic two-way Doppler flow detector has great clinical significance. In cases in which the anesthesiologist feels some anxiety in performing arterial cannulation in a patient with a barely palpable arterial pulse, the availability of such an auxiliary device will ensure swift, successful arterial cannulation.

References

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