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78:792–793, 1993

A Newly Designed Curved Needle for Percutaneous Cannulation of the Internal Jugular Vein

To the Editor:—Among the reported sites for cannulation of internal jugular vein (IJV) is the notch of the clavicle. Initially described by Rao *et al.*[1] and confirmed by Oshima *et al.*,[2] this technique requires considerable skill and experience. One of the most difficult aspects of the procedure is that the posterior wall of the IJV should not be pierced, thereby avoiding complications such as pneumothorax and arterial puncture. Although the conventional straight needle has a sharply angled tip, it usually pierces both walls of the IJV.[3] To penetrate only the anterior wall of the IJV, we present a new approach for IJV cannulation using a newly designed curved needle (fig. 1).

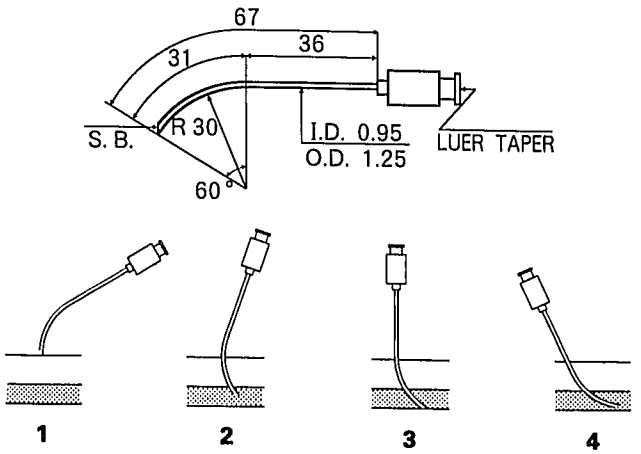

Fig. 1. Schematic diagram of the curved needle and schematic presentation of the internal jugular vein cannulation with the needle.

The needle was designed based on the anatomic profiles of the location of the IJV obtained from computed tomography and magnetic resonance studies. We confirmed that the IJV is located beneath and 1–1.5 cm lateral to the sternal end of the clavicle and parallel to the skin surface of the neck. The distance from skin surface to the axis of the IJV was 22.4 ± 5.1 mm (mean ± SD, n = 36).

The needle is advanced along a curving path to pierce the IJV at a narrow angle with little compression on the vessel wall. Furthermore, the bevel of the needle was shortened to prevent penetration of the posterior wall of the IJV (fig. 1).

With institutional approval and written informed consent from the patients, our new approach was employed for placement of the central venous catheter in 130 (81 males, 49 females) consecutive anesthetized patients ranging in age from 16 to 85 yr. Venipuncture was attempted using the right IJV in all patients. The operator stood at the right side of the patient. Correct identification of the notch of the clavicle was essential. A 23-G probing needle attached to a 2.5-ml syringe was inserted perpendicularly to the skin surface of the neck. The insertion site was about 0.5 cm cephalad from the notch. With the orientation of the probing needle as a guide, the curved needle was introduced. The needle was always advanced perpendicularly to the skin surface of the neck and parallel to the sagittal plane and directed to the thoracic inlet until the IJV was entered. As soon as blood was aspirated, the needle was tilted cephalad. A central venous catheter was then inserted with the aid of a spring guide wire.

The IJV was entered with the probing needle at the first attempt in 129 patients (129 of 130) within 3 cm, usually 1.5–2.0 cm, from the skin surface. In one of the patients, the probing needle did not locate the IJV, so that cannulation with the curved needle was not attempted. The needle was inserted into the IJV in 112 patients (112 of 129) on the first attempt, and on the second attempt in 16 patients.

There was one failure after three trials. All procedures were accomplished with no complications such as arterial puncture or pneumothorax.

The high rate of success (99.2%) of the present technique was comparable to that previously reported by us (99.3%)[2] and suggests that the characteristics of our curved needle are suitable for piercing only the anterior wall of the IJV.

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Atropine Facilitates Neostigmine Reversal of Vecuronium-induced Neuromuscular Blockade

To the Editor:—In their article, Baurain *et al.*[1] demonstrate facilitation of neostigmine reversal of vecuronium-induced neuromuscular blockade by larger doses of concomitantly administered atropine (15–20 μg/kg) when compared with smaller doses of atropine (10 μg/kg) in anesthetized patients. I wish to propose a pharmacokinetic explanation for this observation. Atropine has a more rapid onset of action than neostigmine. Administered simultaneously, I would expect an increase in heart rate and cardiac output to precede cardiovascular effects of the anticholinesterase. Was this change significantly greater in the higher dose atropine group? Increased delivery of the neostigmine to muscle may have influenced recovery of neuromuscular function. The conclusion of the study is based upon a single measurement of 100-Hz tetanic fade, 15 min after the atropine and neostigmine doses were administered. No measurement of tetanic fade was done after 15 min, so there is no basis on which to compare the recovery time for the tetanic fade between the groups.

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In Reply:—Unfortunately, cardiac output was not measured as part of our study.[1] Thus the influence of atropine upon blood flow to muscle must, for the moment, remain hypothetical.

The reasons for limiting tetanic fade stimulations to one measurement performed 15 min after the administration of the atropine and neostigmine mixture were the following: first, high-frequency stim-