

DISCUSSION

The trajectory of the needle with this technique is further away from the apex of the lung than during subclavian vein cannulation, thus decreasing the possibility of inadvertent pleural puncture leading to pneumothorax. However, blind search is discouraged, for pneumothorax is a possibility inherent to any movement of a needle in the vicinity of the dome of the pleura. Our rather frequent failures in patients with old apical tuberculosis suggest anatomic distortion. Repeated attempts under the circumstances would simply increase the incidence of complications.

The direction of the needle at the venipuncture site is in the same axis as the innominate vein, and the puncture site is closer to the superior vena cava than any other approach. This should minimize catheter misplacement, as our findings indicate.

The insertion of the needle is more complicated than with other techniques, and

our distinct impression was that the initial training took somewhat longer. However, once the trainees acquired the technique and became confident, the ease and the speed with which a central vein could be cannulated were impressive.⁴

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An Unusual Complication of Percutaneous Internal Jugular Vein Cannulation, Puncture of an Endotracheal Tube Cuff

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Percutaneous cannulation of the internal jugular vein is gaining favor among anesthesiologists and surgeons for central venous pressure measurement and for intravenous hyperalimentation.¹ The advantages of using the internal jugular vein instead of the subclavian vein for determining central venous pressure have been described.²⁻⁴ We report an unusual complication of percutaneous internal jugular vein cannulation; namely, puncture of an endotracheal tube cuff.

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REPORT OF A CASE

A critically ill, 69-year-old man with renal failure and congestive heart failure, classified ASA V, underwent emergency exploratory laparotomy at the University of Arizona Medical Center. The preoperative diagnosis was ruptured gallbladder. Anesthesia was induced with diazepam, 5 mg, intravenously, and the trachea was intubated orally without the aid of muscle relaxants. The patient was mechanically ventilated with 50 per cent nitrous oxide and oxygen. Central venous pressure measurement was deemed necessary, and catheterization of the right internal jugular vein was attempted with a 14-gauge, 5½-inch, over-the-needle Teflon catheter with the patient in Trendelenburg position. During the attempt to achieve venipuncture, a sudden leak in the previously well-sealed endotracheal tube was noticed. Attempts to re-establish this seal between the trachea and the endotracheal tube were unsuccessful. The patient's trachea was then reintubated with another orotracheal tube and the operation proceeded without difficulty. The

internal jugular cannulation was abandoned and external jugular catheterization on the left was performed. The first endotracheal tube was inspected and a small laceration was found in the cuff. Daily roentgenograms of the chest for the first three postoperative days indicated the absence of pneumothorax, pneumomediastinum, or subcutaneous emphysema. The patient died on the tenth postoperative day of massive sepsis and shock.

DISCUSSION

Numerous complications of internal jugular vein catheterization have been reported, the most common being carotid artery puncture, pneumothorax, hydro-pneumomediastinum, air embolism, thrombophlebitis, and sepsis.³⁻⁴ Thoracic duct injury has been reported as a complication of jugular vein catheterization on the left.² A lethal hemorrhage secondary to puncture of the ascending cervical artery in an anticoagulated patient has also been reported.⁵ To our knowledge, puncture of an endotracheal tube cuff has not been reported.

The internal jugular vein emerges from the base of the skull posterior to the carotid artery and terminates at the anterior end of the first rib posterior to the clavicle. In traversing the neck it is lateral and then anterolateral to the carotid artery. It is covered by the sternocleidomastoid muscle, the posterior belly of the digastric, and the omohyoid (fig. 1).

Our puncture of the trachea and endotracheal tube cuff required that the needle be directed too far medially. This complication has occurred elsewhere, although no description of it has been published (L. Adler, personal communication). No complication resulted from our inadvertent puncture of the trachea. The anesthesiologist performing internal jugular vein punctures should be aware that tracheal perforation is a hazard if the needle be misdirected too far medially, and he should be alert for the occurrence of this problem.

SUMMARY

The cuff of an endotracheal tube was punctured during internal jugular vein

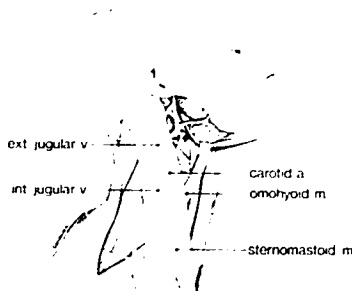


FIG. 1. Anatomy of the muscular and vascular structures in the neck with the head turned to the left.

catheterization. Care in the selection of external landmarks, proper direction of the needle, gentleness in manipulation of needles and catheters, and maximal venous distention are all important in minimizing complications of internal jugular vein cannulation.

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