

Central Venous Access in Children Via the External Jugular Vein

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Use of the external jugular vein for central venous catheter placement employing a flexible angiographic wire catheter guide (J-wire) is associated with a 75-95 per cent success rate in adult patients.^{1,2} Applicability of this technique to the pediatric patient has not been reported. It was the purpose of this study to determine the value of the external jugular J-wire technique in pediatric patients.

METHODS

Twenty pediatric patients (mean age 56 months, mean weight 18.9 kg) requiring access to a central vein as determined by physicians other than the investigators were studied. Indications for insertion of a central venous catheter included administration of chemotherapeutic and inotropic drugs, total parenteral nutrition, and administration of intravenous fluids when no peripheral vein was available. The study was approved by the institutional Human Subjects Committee.

All patients were placed in the Trendelenburg position, a roll placed under the shoulders, and the head turned to either side. After sterile preparation and draping, the right or left external jugular vein was cannulated with an 18-gauge 6.35-cm (2½ inches) or 20-gauge 3.8-cm (1½ inches) over-the-needle Teflon® catheter. If no external jugular veins were visible, central venous system access was accomplished via another route although the patients still were included in the study for completeness. After obtaining entry into the external jugular vein, the needle was removed and the catheter aspirated to verify successful placement. A 0.064-cm (0.025-inch) diameter 40-cm long flexible angiographic wire catheter guide (J-wire) with a 3-mm radius of curvature‡ was inserted through the catheter and advanced until it was estimated to be in the superior vena cava. If the wire could not be advanced into the chest after 5 min of manipulation, the

procedure was considered to be a failure and central venous access was obtained using another approach. After the wire was advanced into the region of the superior vena cava, the initial access catheter was removed and a definitive Teflon® or polyvinylchloride (PVC) catheter of the appropriate size and length was then advanced over the J-wire into the intrathoracic position and the wire was then removed. The catheter was sutured in place, connected to an intravenous infusion, a dressing applied, and a chest radiograph obtained.

RESULTS

In three of the 20 patients, no external jugular vein could be identified. In seven of the remaining 17 patients, the J-wire could not be passed or manipulated into the thorax. There were no inadvertent carotid artery punctures and no patients sustained a pneumothorax. In one patient the wire perforated the vein during manipulation and was thought to have entered the chest, but a subsequent chest radiograph revealed no evidence of bleeding or pneumothorax. Radiographic examination found all successful catheter placements to be in the superior vena cava or right atrium. The overall success rate of central catheter placement in patients with visible external jugular veins was 59 per cent (10 out of 17 insertions).

There was no correlation between the size of the patient and the rate of success. The technique was successful in two of the three smallest children (1.9 and 8.2 kg) but failed in two of the three largest children (30 and 44 kg).

DISCUSSION

We found the external jugular J-wire catheterization technique to be useful although not ideal in pediatric patients. We are unable to explain the difference in success rate in our pediatric age group compared to the previously published studies in adults^{1,2} as analyzed by chi-square ($P < 0.01$). Differences in the diameter of the external jugular vein in pediatric patients compared to adult patients, may be responsible for the diminished success in the pediatric group. The smaller diameter external jugular vein in the pediatric age group may not permit optimum utilization of the J configuration of the wire because the radius of curvature of the J may be larger than the internal diameter of the vein, which would not permit the J configuration to reform once the

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‡ Argon Medical Products, Athens, Texas.

wire is placed in the vein. Studies are currently in progress to determine if a wire with a smaller radius of the J portion (1.5 mm) is able to improve the success rate.

Nevertheless, because cannulation of the external jugular vein is performed under direct vision, the risk of arterial puncture and pneumothorax is extremely low. If the J-wire will not pass into the thorax, an internal jugular venipuncture can be done without redraping. Physicians who are uncomfortable with insertion of a catheter in a central vein in children via the internal

jugular or subclavian route, may feel more comfortable with this technique.

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An Unusual Adverse Drug Reaction to Thiopental

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Despite extensive use of thiopental, fewer than sixty cases of adverse reaction, usually of an anaphylactoid-type, have been reported during the past 25 years.¹ Barbiturates can cause reactions other than of an anaphylactoid-type. One such reaction, fixed-drug eruption, is a distinctive eruption occurring as erythematous, well-demarcated plaques on skin and/or superficial erosions of the mucous membranes, which appear at the exact same site following each exposure to the offending drug.² Crohn first described this reaction in himself in 1927, when he suffered a recurrent eruption associated with the use of barbituric acid in allonal.³ Since that time, barbiturates have been among the drugs most commonly implicated in this type of reaction.⁴

In a recent review of adverse effects of intravenously administered drugs,¹ fixed-drug eruption was not mentioned, perhaps because this reaction is rare with thiopental, or the reaction is not readily recognized by anesthesiologists since it develops several hours after the

conclusion of anesthesia. Although not as potentially serious as anaphylactoid reactions, fixed-drug eruptions can cause considerable discomfort which can be avoided by recognition of the disorder and exclusion of the offending drug. We, therefore, describe a patient who developed a fixed-drug eruption to thiopental on two consecutive occasions—the second of which could have been prevented by the recognition of the nature of the reaction on the first occasion.

REPORT OF A CASE

A 65-year-old man with a bladder tumor, underwent anesthesia for cystoscopy and bladder biopsy. He was premedicated with atropine and codeine and received thiopental iv and O₂, N₂O, and enflurane via an endotracheal tube. Following anesthesia, the patient complained of painful erosions of his lips which cleared without treatment over a period of days. Two previous anesthetics in which thiopental, fentanyl, and enflurane were given were uneventful (table 1).

Two months later, he again underwent cystoscopy and bladder tumor check. The anesthesia consisted of thiopental iv, O₂, N₂O and enflurane via a mask with no premedication. The procedure lasted 40 min. Eight hours later, the patient noted some swelling of his lips; and on the following morning noted several burning skin lesions on his hands, arms, and legs, as well as painful mouth lesions. This was accompanied by malaise but no fever.

He was referred to the Dermatology Clinic for evaluation of his lesions. On physical examination, he appeared in moderate distress from his skin and mouth lesions. His vital signs were normal and he was afebrile. His mouth and lips were markedly erythematous and eroded. There were several small vesicles present on his lips (fig. 1). Several well-demarcated violaceous, edematous and vesicular lesions were present on his hands, forearms, and legs (fig. 2). They ranged from 0.5 to 2.0 cm in diameter.

Laboratory data included a normal CBC, sedimentation rate, chemistry screen, and uric acid as well as negative KOH preparation of skin and mouth lesions. Cultures of both skin and mouth lesions were neg-

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