Aortic Dissection Complicating Percutaneous Jugular-vein Catheterization

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Percutaneous puncture of the internal jugular vein is a well-recognized technique, with a few reported complications.1,3,5–7 It has been widely used as an approach to the superior vena cava for pressure monitoring or fluid administration, and as a pathway to the heart or the inferior vena cava.1–4

We have observed a previously unreported complication of jugular venous catheterization, and wish to call attention to aortic dissection as a hazard of this technique.

REPORT OF A CASE

A 54-year-old white man, admitted to the hospital with abdominal pain, had a previous diagnosis of chronic alcoholism and cirrhosis. There was no history of hypertension, syphilis, or significant chest trauma.

Physical examination revealed the stigmata of cirrhosis, and the patient's subsequent hospital course was steadily downhill. After right and left subclavian central venous lines proved unsatisfactory, right internal jugular venous catheterization was attempted. This met with considerable difficulty, and several attempts were made using an Intramedicut Kit with a 7-cm needle and 20-cm blunt catheter. A chest film obtained for catheter placement showed an oblique course of the opaque catheter across the mediastinum, with the tip projected over the left inferior margin of the fifth thoracic vertebral body. Comparison with a film taken less than 12 hours earlier showed marked widening of the mediastinum (fig. 1). The jugular venous catheter did not function properly and was discontinued after a few hours. The patient's condition continued to deteriorate and he died the following day.

Postmortem examination revealed a large mediastinal hematoma, with an adventitial dissection of the aorta extending over the arch into the thoracic aorta, and involving the origins of the innominate and carotid vessels. Only minimal atheromatous disease was present.

DISCUSSION

Catheterization of the superior vena cava is a widely accepted clinical practice with several applications, including fluid administration, central venous pressure monitoring, and hyperalimentation. The internal jugular route has been adopted in many centers, primarily because of the serious potential hazards of the subclavian approach.1,3 The basic puncture approach is through a site 5 cm above the clavicle.1,3 Some investigators recommend a 14–18-gauge Intracath or Venacath 13–20 cm long.8 The internal jugular vein lies slightly lateral and posterior to the carotid vessels in the neck and passes under the sternocleidomastoid to join the subclavian vein at the root of the neck, to form the innominate vein.8 The right innominate vein generally follows a straight and relatively short course into the superior vena cava and thence to the right aurium. With undue force, a needle or blunt catheter may produce a penetrating injury,9 and aortic involvement is possible.

A case of aortic dissection resulting from attempted percutaneous catheterization of the superior vena cava is described. Since the aorta may lie in a path along a straight line from the internal jugular and
right innominate vein, it is likely that this complication will occur most often as a result of forceful attempts when catheterization via the internal jugular vein is difficult.

References


Severe Congenital Subglottic Stenosis in Association with Congenital Duodenal Obstruction

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Congenital subglottic stenosis is infrequent. Holinger and Brown reported 53 cases collected during a period of 30 years in a pediatric hospital and a university endoscopic clinic. Fearon and Cotton collected 84 cases during a ten-year period in a similar setting. The occurrence of congenital subglottic stenosis in association with congenital duodenal obstruction is very unusual. It does not appear in the listings of anomalies associated with congenital duodenal obstruction reported by Aitken, Moore, Kiesewetter and Koop, or Rickham.

Report of a Case

A 1½-day-old white male infant delivered by cesarean section because of previous cesarean section was admitted June 10, 1977, with a history of wheezing and vomiting. An upper gastrointestinal series performed at the referring hospital showed no passage of barium beyond the stomach, and a diagnosis of duodenal atresia was made. On admission to this hospital, the infant, who weighed 2560 g, appeared normal except for slight to moderate wheezing on inspiration. X-ray of the chest showed no abnormality. Laparotomy with general anesthesia was scheduled. Aspiration or early respiratory distress syndrome was suggested as a possible cause for the wheezing.

Several attempts to achieve awake intubation were made by the anesthesiologist, using endotracheal tubes of 3.0 mm ID and 2.5 mm ID, with and without a stylet, but obstruction was repeatedly encountered below the vocal cords. The anesthesiologist then suggested the possibility of subglottic stenosis. After failing in an attempt to pass a 2.5-mm-ID endotracheal tube, the surgeon proceeded to perform a tracheostomy using local anesthesia, with oxygen delivered under intermittent positive pressure from the anesthesia circuit. Insertion of the tracheostomy tube provided complete relief of wheezing. Laparotomy was postponed until two days later, at which time exploration revealed the duodenal obstruction to be due to an annular pancreas with malrotation. A duodenoduodenostomy and lysis of Ladd’s bands were performed.

The postoperative course was complicated by recurrent obstruction of the tracheostomy tube, left pneumothorax, and bilateral pneumonia. Weight gain was slow, and allergic dermatitis appeared.

Laryngotracheoscopy was performed three weeks after tracheostomy and again at seven weeks. At the initial examination circumferential narrowing was encountered 1 cm distal to the vocal cords. The apparent aperture would not admit a 2.5-mm bronchoscope, nor could the tracheostomy tube be visualized distal to the obstruction. A polyethylene catheter 1 mm in diameter was successfully passed through the apparent aperture. On the second examination a 3-Fr polyethylene catheter was inserted through the area of constriction but a 2.5-mm bronchoscope again could not be passed.

A tracheogram obtained two days after the second laryngotracheoscopy (fig. 1) showed a segment of stenosis 1-2 mm in diameter extending from the glottis inferiorly approximately 1 cm. The patient by this time had resolution of the pulmonary problems and was showing a steady weight gain. When his weight reached 2880 g he was transferred to a convalescent facility with a 00 Shiley tracheostomy tube in place.

Discussion

Congenital subglottic stenosis is a cause of neonatal asphyxia. Tracheostomy is necessary in 50 per cent