

## UMBILICAL ARTERY CATHETERISATION IN NEWBORN INFANT

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### SYNOPSIS

**A simple and easy determination of the umbilical catheter for positioning it to thoracic aortic region in neonate is introduced. Retrospective X-ray studies have confirmed the usefulness of this method, which is: catheter length from abdominal wall to thoracic aorta at level T<sub>6</sub> — T<sub>10</sub> = distance from shoulder to umbilicus in cm + 3 cm**

### INTRODUCTION

Catheterisation of umbilical arteries has become a useful and practical procedure for monitoring ventilatory and metabolic status of the sick neonate in neonatal intensive care units throughout the world.

It is recommended that the tip of the catheter be put either (1) between the aortic bifurcation and the origin of the renal arteries or (2) in the thoracic aortic region at a level of T<sub>6</sub> and T<sub>10</sub> (Fig. 1). Catheter located in the (1) position is rather short; from a practical point of view, it may easily slip out and cause active bleeding, especially when applied to an active neonate, or due to improper anchoring.

Methods for determining the length of the catheter to be inserted in an appropriate part of the arterial system has been recommended by Dunn (1966), Gupta et al (1968), and Weaver et al (1971). Since umbilical artery catheterisation is always performed in an emergency situation, not much time can be wasted in calculating the length of the catheter to be inserted. A simple method has been used for placing the catheter tip at a predetermined position within the thoracic aorta.

### METHODS

Ten premature sick neonates, between 34 and 37 week gestation, and ten term sick neonates are chosen. The procedures are performed within 24 hours after birth. After sterile preparation, a radiopaque lined No. 3 or No. 5 Franch catheter with

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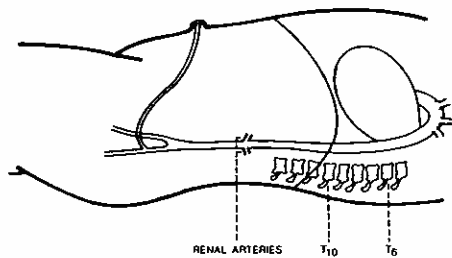


FIGURE 1 : DIAGRAM OF THE NEONATE UMBILICAL ARTERIAL SYSTEM

rounded tip (Argyle umbilical catheter) is selected. Using the catheter measure the direct distance from the infant's shoulder to his umbilicus. The length of this distance in centimeter plus three centimeters will be the length of the catheter required to be inserted and place the tip of the catheter into the expected thoracic aortic region, i.e. catheter length from abdominal wall to thoracic aorta at level T<sub>6</sub>—T<sub>10</sub> = distance from shoulder to umbilicus in cm + 3 cm. Chest x-ray films are taken after the procedure to determine the location of the catheter.

**RESULTS AND DISCUSSION**

Roentgenologic study after catheterisation reveals that all the tips of the catheters are placed between thoracic vertebral T<sub>6</sub> and T<sub>10</sub> region (Fig. 2). The position of the tips in the premature neonates group. Because of individual variation of neonate and physician, post-operative x-ray evaluation is necessary.

Although this is a rather simple and safe procedure, the physician should be aware of the compli-

cations such as infection, vasospasm, thrombosis, embolism, haemorrhage, and vascular perforation etc. As the umbilical arterial catheter is mainly used for assessing the ventilatory and metabolic

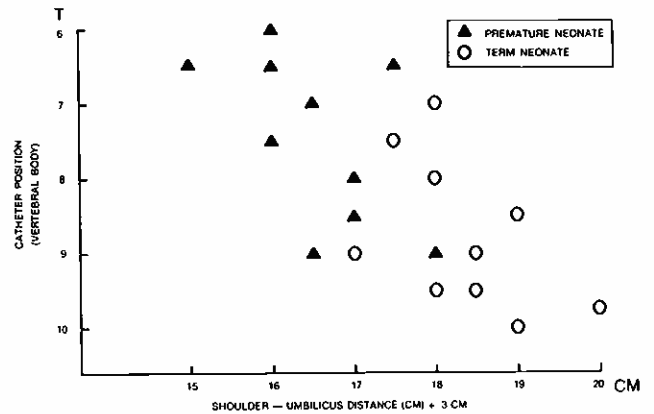


FIGURE 2 : RELATION OF CATHETER POSITION TO SHOULDER - UMBILICUS DISTANCE IN CM + 3 CM

status, medication and parenteral infusion should not be given through the umbilical arterial route. Inexperienced house staff performing the catheterisation should be under supervision. If he fails in catheterising the first artery, second umbilical artery should be left for his supervisor to perform.

**REFERENCES**

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