Title : BACTERIOLOGIC COMPARISON OF EPIDURAL/CAUDAL TECHNIQUES

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Introduction. Although there have been several studies on the bacteriologic aspects of epidural technique,[1-3] there is none on caudal blocks. Moreover, many anesthesiologists refrain from using caudal analgesia because of fear of infection. For these reasons, we conducted the following study.

Method. To minimize the variables, both epidural and caudal catheters were simultaneously used in the same patient (double-catheter technique). The patient's back was cleansed using provodine-iodine (Betadine) spray. The excess of fluid was removed and the catheters were inserted under aseptic conditions. No bacterial filters were attached. During the first stage of labor, 0.5% bupivacaine was injected in therapeutic doses through the epidural catheter. To keep the number of injections equal, each time an epidural top-up dose was administered, 1 ml of the drug was also injected caudally. During the second stage of labor, 2% chloroprocaine was injected through the epidural and caudal catheters to achieve both abdominal and perineal analgesia. In the Recovery Room, bacterial cultures were taken, first, from the skin surface around the catheter entrance. Then, the skin was sterilized using 70% alcohol and allowed to dry. The catheters were pulled out under sterile conditions and cultures were taken from: (1) the segment of the catheter in the tissues of the back outside the epidural space; (2) the terminal 2 cm of the catheter inside the epidural space; and (3) the fluid inside the terminal part of the catheter. A total of 16 cultures from each patient were grown for both aerobic and anaerobic organisms. For aerobics, the specimens were incubated in blood agar plates and identified 48 hours later by Gram stain morphology and biochemical testing. For anaerobics, the specimens were incubated in GasPak® (by Becton, Dickinson and Co.), and read at 48 hours. Positive cultures were transferred to chopped meat glucose broth. Twenty four hours later, liquid gas chromatography was used to identify the genus of the isolette by determining the acids produced in the broth, and biochemical tests were utilized to determine the species. The sequence of obtaining the cultures from the epidural or caudal region was randomly selected and the bacteriologist was unaware of that sequence. The patient was followed-up during her hospital stay for evidence of local infection at the site of entry or deep in the epidural space. About six weeks after discharge, the patient was also contacted.

Results. The duration of catheter insertion was 80-345 minutes (mean = 176 minutes). The number of injections varied from two to four (mean = 2.33 times). Two hundred and forty cultures were obtained from 15 healthy parturients. The incidence of positive cultures and the number of colonies with caudal analgesia were significantly higher than those with epidural technique ($p < 0.05$) (see table). The most common organism was staphylococcus epidermidis; others were diphtheroids, microphilic streptococcus, and fusobacterium symbiosum. No E. coli was cultured. If cultures obtained from the skin surface were excluded, no organisms were isolated with epidural or caudal technique. The follow-up of the patients showed no evidence of clinical infection.

Discussion. Fusobacterium symbiosum, an anaerobic intestinal inhabitant, was found only in one culture from the skin surface in the caudal area due to the proximity to the anal region. The other organisms were normal skin saprophytes. The absence of positive cultures from the segments of the catheters embedded in the tissues and from the fluid inside the catheters signifies the absence of bacterial infection of tissues. Therefore, there was no evidence of tissue infection, bacteriologic or clinical, in either group despite the higher incidence of positive skin cultures with caudal than with epidural technique. To minimize bacterial growth on the skin, which is potentially harmful, more attention should be paid to skin sterilization with caudal than with epidural technique, and Betadine ointment should be applied at the skin-catheter interface.[4]

Table

Number of positive cultures and colonies with epidural and caudal techniques in 240 cultures

Site of culture	Epidural			Caudal		
	Aerobic	Anaerobic	Total =120	Aerobic	Anaerobic	Total =120
Fluid in catheter	0	0	0	0	0	0
Catheter in tissues	0	0	0	0	0	0
Catheter in epidural space	0	0	0	0	0	0
Skin surface	1 (1)	1 (1)	2 (2)	4 (12)	5 (15)	9* (27)*
Total	1 (1)	1 (1)	2 (2)	4 (12)	5 (15)	9* (27)*

- The numbers between brackets indicate the number of colonies

* Statistically significant higher numbers of positive cultures and colonies with caudal techniques at the skin surface ($p < 0.05$).

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