TITLE: INTRAOCULAR PRESSURE CHANGES AFTER TRACHEAL INTUBATION IN CHILDREN

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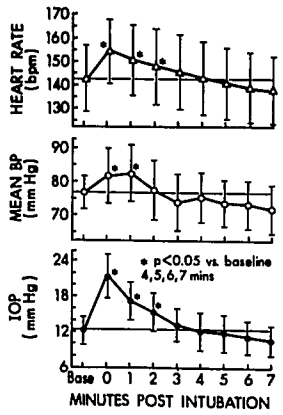
Intraocular pressure (IOP) measurements are inaccurate in awake frightened and struggling children. IOP determination is usually performed under general anesthesia, which in this age group, often requires an endotracheal tube (1). However, laryngoscopy and tracheal intubation are associated with a marked rise in IOP (2). This study was designed to determine the time course of IOP changes associated with tracheal intubation.

After obtaining IRB approval and parental consent, we studied 13 ASA I children scheduled for elective strabismus surgery. No premedication was administered. Anesthesia was induced with nitrous oxide (N_20) and halothane and all patients received atropine 0.1 mg/kg iv. The oropharyngeal end-tidal N_20 and halothane concentrations (3) were kept constant for 10 mins to obtain a baseline IOP measurement using a hand held Perkin's applanation tonometer. All patients underwent tracheal intubation 2-3 min after atracurium, 0.5 mg/kg iv. The IOP, heart rate, and mean blood pressure (BP) were measured immediately after tracheal intubation and at 1 min intervals for 7 mins while end-tidal anesthetic concentrations were kept constant. Data were analyzed using repeated measures of ANOVA, $p<0.05$ was considered significant.

The time course of significant increases in IOP, heart rate and mean BP above preintubation levels were similar (fig. 1).



Changes in BP have minimal effect on IOP as aqueous humor is displaced from the anterior chamber when BP rises. However, the sympathetically mediated vasoconstriction following tracheal intubation increases venous return, raises CVP and thus produces an increase in IOP (4). Therefore, IOP in anesthetized, intubated children should not be measured until heart rate and mean BP have returned to preintubation levels (fig 1).

References 1. Crone RK: Peds Anes ed Gregory GA 1983, 35-62. 2. Murphy DF: Anesth Analg 64,520,1985 3. Watcha et al: Anesthesiology 69:412, 1988. 4. Duncalf et al: Int Ophthalmol Clin 13:21, 1973

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TITLE: CAUDAL EPIDURAL ANESTHESIA IN SIXTY-NINE CONSCIOUS PREMATURE AND HIGH-RISK INFANTS

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Caudal epidural anesthesia has been described as an alternative to general anesthesia in premature and high risk infants.[1,2] We present our experience with 69 infants having surgery under caudal anesthesia.

Materials and Methods: IRB approval and written parental consent were obtained for 20 infants enrolled in a pilot study[2] and 29 infants enrolled in a blinded comparison of bupivacaine with and without 1:200,000 epinephrine. Data were collected retrospectively for the remaining infants. Our technique has been described in detail elsewhere.[2] Infants received 1 ml/kg of 0.375% bupivacaine (with or without 1:200,000 epinephrine) using a "no touch" technique and slow injection with frequent aspiration. Onset and duration of caudal anesthesia were noted by the loss and return of withdrawal to toe pinch. Demographic data and vital signs are presented as mean ± SD. Results are presented as mean ± SEM. Data were analyzed using analysis of variance, paired or unpaired Student's T tests, and linear regression. Results were considered significant for $P<0.05$.

Results: Sixty-nine caudal epidural anesthetics were administered to 68 infants, 58 male and 10 female. Mean gestational age and weight at surgery were 45 ± 9 wk (range 35 to 83 wk) and 3570 ± 1190 gm (range 1200 to 6900 gm) respectively. Caudal block was completed in less than 2 minutes in over 75% of the infants. Onset occurred in 10 ± 0.5 min and onset of anesthesia correlated with weight (onset = 4.5 min + 1.4 min/kg, r=.455, $P<0.001$). Median anesthetic level was T_5 and, in contrast to other reports[3], did not correlate with weight or gestational age at surgery (median level T_6 for infants >3.5 kg and <3.5 kg). Duration of anesthesia was 135 ± 5 min and did not correlate with weight. Vital signs before and after caudal block are shown below.

Caudal epidural anesthesia was successful in 63 instances; surgery was completed under spinal anesthesia in 5 infants. Fourteen infants required supplementation with insufflation of nitrous oxide and/or ketamine in doses of 0.25 mg/kg IV during surgery. All infants remained arousable during surgery. Caudal anesthesia and surgery were generally well tolerated; vagal responses during peritoneal traction, manifested as bradycardia and apnea, were noted in 7 infants, 2 of whom required treatment with atropine. Infants were monitored for apnea for 24 hours after surgery; 1 infant required CPR for an apnea spell 12 hours following surgery[4].

Conclusions: We have found caudal epidural anesthesia to be an acceptable alternative to general anesthesia in premature and high-risk infants having surgery below the umbilicus. Our success rate is over 90% and surgery and anesthesia, including the relatively large dose of bupivacaine, are generally well tolerated. While the incidence is lower than after general anesthesia, apnea can occur post-operatively and appropriate monitoring should be employed.

References:

1. Spear et al. **Anesthesiology** 1988; 69:407.
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3. Spear. **Anesthesiology** 1989; 71:A1016.
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VS	Before	After	P
0_2 Sat	96 ± 4	98 ± 3	<0.02
HR	159 ± 21	165 ± 17	<0.025
SBP	85 ± 14	90 ± 17	N.S.