

FIG. 1. On the left, a pediatric malleable metal stylet. In the center, a 2.5 mm ID Portex endotracheal tube. On the right, a stylet curved tube used in blind nasal tracheal intubation of a 2.9-kg stillborn infant at the first attempt.

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A Unique Complication of a Lumbar Epidural Catheter

To the Editor:—In a recent case, our obstetrical anesthesiology team found removal of a 20-gauge, 36-inch Arrow E-C 5000 Theracath epidural catheter, after cesarian section, difficult. The tip of a 17-gauge Touhy needle had been inserted into the L-2/L-3 interspace. After identification of the epidural space, the catheter was easily threaded 2 cm. Following a test dose, surgical anesthesia to T-4 was readily achieved with 18 ml of 0.5% bupivacaine.

After completion of the surgery, the patient was positioned in a left lateral decubitus position with 40° of flexion for epidural catheter removal. Despite steady traction on the catheter, it could not be withdrawn. After assessing that the catheter had been sufficiently withdrawn to place it outside the epidural space, constant perpendicular force on the catheter was applied. After a distinct pop, the catheter was removed intact from beneath the skin. Examination of the retrieved catheter

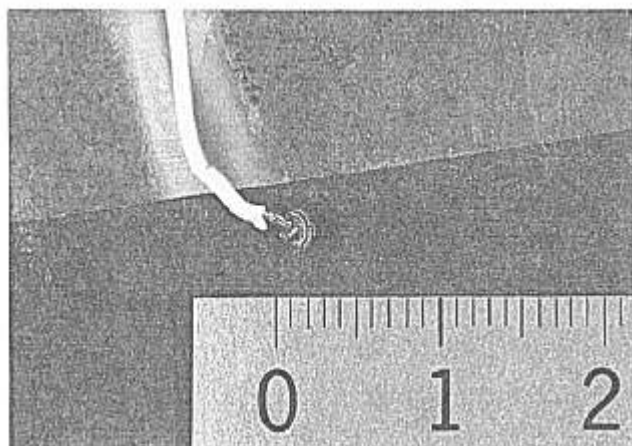


FIG. 1. Epidural catheter following removal with knot in the tip.

showed a tight distal knot of the spring wire tip. We suspected that the knot was spontaneously produced as the catheter doubled back upon itself during threading.

Three cases of knotted catheters have been reported in the literature, all occurring in the caudal canal.¹⁻³ None of the knots involved the spring wire tip of the epidural catheter.

Non-distal tip catheter knots can generally be avoided by inserting the catheter tip no more than 4 cm into the epidural space. Tight distal knots, as shown in figure 1, are probably a complication of local anatomy.

We recognize that approximation of the catheter length may be difficult because of catheter stretching. Therefore, an ultrasound or

an x-ray may be useful in identifying whether the catheter is retained in the epidural space.

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Masseter Muscle Spasm, Succinylcholine, and Strabismus Surgery

To the Editor:—Carroll¹ recently described an increased incidence of masseter muscle rigidity (MMR) in children with strabismus who were anesthetized with halothane and paralyzed with succinylcholine. Based upon a retrospective chart review, she reported an incidence of MMR of 2.8% among the 211 patients with strabismus compared with 0.72% among 1257 patients without strabismus. Several authors have reported that the results of contracture testing show malignant hyperthermia susceptibility (MHS) in more than 50% of patients who had an episode of MMR.^{2,3}

We have reviewed our most recent experience of 755 cases of strabismus surgery at The Mount Sinai Hospital, all of which were performed by the same surgeon (E.L.R.) over the period 1981-1987. In virtually all of the cases, the children were anesthetized using an inhalation induction with halothane, followed by intravenous atropine and a non-depolarizing neuromuscular blocker prior to tracheal intubation. Anesthesia and relaxation were then maintained using halothane or isoflurane and incremental doses of the non-depolarizing relaxant, as indicated. The average duration of surgery was 60 min. There were no cases of suspected or confirmed malignant hyperthermia among our 755 patients anesthetized, as described, with the avoidance of succinylcholine.

Schwartz *et al.*⁴ observed that the incidence of MMR in their pediatric surgical population was 0.12% (of 12,169 anesthetics) and that all incidents of MMR occurred in patients who had received both halothane

and succinylcholine. In the latter subgroup of 1466 patients, the incidence of MMR was 1.03%.⁴

These findings deserve further comment:

1. If the incidence of MMR among patients with strabismus is 2.8%,¹ then in our population of 755 patients, had succinylcholine been used, we would expect to have seen 22 cases, of whom 11 would have been MHS.

2. The absence of malignant hyperthermia in our patients suggests that the margin of safety was increased by using a non-depolarizing neuromuscular relaxant, rather than succinylcholine, to facilitate tracheal intubation and subsequent relaxation. The avoidance of succinylcholine in our patients was also related to surgical preference. Thus, we have found that operating conditions for strabismus surgery are much improved in the absence of the tonic ocular muscle contraction that would otherwise occur following the administration of succinylcholine.^{5,6}

3. Carroll's reported incidence of 2.8% for MMR among patients with strabismus is based upon six episodes occurring in a retrospective review of 211 patients.¹ In her study, MMR was defined as "jaw tightness interfering with tracheal intubation that occurred despite adequate doses of succinylcholine. Its occurrence was the clinical judgement of the anesthesiologist."¹ Since the diagnosis of MMR is somewhat subjective, before accepting the validity of her data, it would be of interest