Title: INTRATHECAL MORPHINE REDUCES POST THORACOTOMY MEPERIDINE REQUIREMENTS

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The use of intrathecal morphine (ITM) for post-thoracotomy pain control has not been extensively reported. This study aimed to assess meperidine requirements, the degree of pain relief, and consciousness level following lumbar injection of normobaric ITM in the post-thoracotomy period.

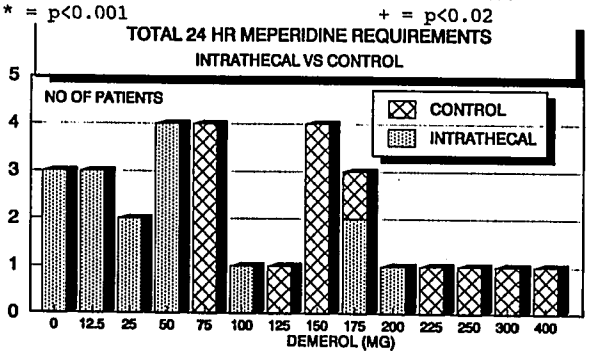
Written informed consent was obtained from 30 adult patients (pts) scheduled to undergo thoracic surgery. Anesthesia was induced with thiamylal sodium, fentanyl 100 ug, and vecuronium, and was maintained with enflurane, without additional narcotic administration. Prior to skin incision, 16 pts received ITM (12 ug/kg) while the remaining 14 pts served as controls. Following extubation IV meperidine was given in incremental doses of 12.5 mg to keep the pts as comfortable as possible. The nurses caring for the pts were blinded to the presence or absence of ITM. Pain was assessed and scored by the nurses as 0=pain free, 1=mild, 2=moderate, 3=severe and 4=unbearable. Level of consciousness was evaluated as: 0=unarousable, 1=response to tactile stimulation, 2=response to verbal command and 3=awake.

Demographics and length of surgery were similar in both groups. The total 24 hr meperidine requirements were significantly greater in the control group. The ITM group had significantly lower pain scores and a higher level of consciousness (Table). The figure depicts the patients' distribution based upon their total 24 hr meperidine requirements. Twelve out of 16 pts in the ITM group required 50 mg or less, of whom 4 required no meperidine at all. All pts in the control group required 75 mg of meperidine or more. In conclusion, satisfactory postoperative analgesia can be achieved in patients after thoracotomy with the pre-incision intrathecal administration of morphine.

Table

		ITM	Control
Meperidine requirements (mg)	Mean ± SD	59 ± 68.7	167.8 ± 97*
	Median	37.5	143.7
Pain scores	Mean ± SD	1.4 ± 1.1	2.4 ± 0.9+
	Median	1.0	2.5
Consciousness scores	Mean ± SD	2.7 ± 0.6	1.2 ± 0.5*
	Median	3.0	1.0

* = p<0.001 + = p<0.02



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Title: **INFLUENCE OF LOCAL ANESTHETIC VOLUME ON THE SPREAD OF INTERCOSTAL BLOCK**

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Previous reports in cadavers and patients studying the spread of local anesthetic with intercostal block used small volume and did not address the relationship between the volume of local anesthetic and area of the spread. The present study is to evaluate the spread following 5 ml and 10 ml of local anesthetic mixed with methylene blue given for intercostal block.

Materials and Methods

The study was approved by the IRB. After informed consent, 20 patients for thoracotomy were included in the study. Their mean age was 58.4 years. Induction of anesthesia was with 5 mg/kg thiopental. Maintenance of anesthesia was done using isoflurane nitrous oxide and oxygen with vecuronium muscle relaxation. Double lumen endotracheal tubes were used for one lung ventilation. Intercostal block was done near the angles of the ribs, 7-8 cm from midline, posteriorly, 2 interspaces below the incisional intercostal space. Five ml or 10 ml of 0.5% bupivacaine with methylene blue (9 ml local anesthetic +1 ml methylene blue) was injected at the inferior border of the ribs, on the inner surface by the same physician in all patients. The surgeons were not informed of the volume of injectate. Following thoracotomy the surgeon measured the spread of methylene blue and noted the number of interspaces discolored. Statistical analysis was done using Wilcoxin signed rank test and two sample t-test.

Results

Eight patients received 5 ml of local anesthetic and 12 received 10 ml. The patients who received 10 ml volume had greater spread of the local anesthetic and all had two or more intercostal spaces discolored. Seven of the eight patients who received 5 ml of the solution had the spread confined to one intercostal space. The difference was statistically significant (P=0.02).

Discussion

Our study indicates that the spread of local anesthetic is volume dependent, 5 ml spreading in one interspace and 10 ml in two or more interspaces and a larger area. The spread, using volumes less than 5 ml, was greater than in one intercostal space in one study[1] or confined to one interspace in other studies[2,3] in anatomic preparations and patients. We believe the spread of local anesthetic following intercostal block depends upon the volume, the location of injection, and the size of the intercostal spaces. Injection deeper to internal intercostal muscle is associated with greater spread. The spread involves more interspaces in smaller individuals because of narrow interspaces.

We conclude that the volume of local anesthetic is an important factor for the area of spread of local anesthetic following intercostal block.

Table: **SPREAD OF LOCAL ANESTHETICS FOLLOWING INTERCOSTAL BLOCK**

	10 ml group N=12	5ml group N=8
Width cm m ± sd	6.0 ±1.5	2.2 ±1.7
Length cm m ± sd	8.7 ±1.6	6.9 ± 2 3
Area cm^2 m ± sd	51.1 ±19	17.6 ±17.6
Number of interspaces (mean ± sd)	2.4 ±0.06	1.1 ±0.03
	2 n=8	1 n=7
	3 n=3	2 n=1
	4 n=1	

References:

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