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POSTER SESSION II

A741

TITLE: TRIAL OF THEREX IMPLANTABLE PUMP DELIVERED INTRATHECAL M.S. IN CANCER PAIN CONTROL

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A second generation continuous flow implantable infusion pump (Therex Model 3000 Therex Corp, Walpole MA) was tested in cancer pain patients for delivery of preservative free Duramorph (Morphine Sulfate-[MS]). Nine patients with a variety of cancer diagnoses and intractable pain unrelieved by systemic narcotics or with related sedative/confusional complications, gave informed consent. Types of pain included, Somatic pain n=9, visceral pain n=6, neurogenic/deafferent pain n=9. Depression and cognitive defects were screened as was response to intrathecal morphine if possible. Outcomes assessed included baseline and monthly oral narcotic intake expressed in systemic morphine equivalents (MEQ); Visual Pain Intensity Analogue Scores (VPAS), Karnofsky Subjective Function Scale, and a global assessment of pain control based upon the analgesic efforts required: Excellent = no significant additional analgesics; Good = additional narcotic up to preimplant baseline; Fair = high dose systemic narcotic beyond baseline with or without adjunctive agents; and Poor=failed pain control despite all above or if neurodestructive procedure performed postimplant. All patients had a lumbar intrathecal silicone catheter and Therex 3000 Implantable pump placed for therapy. Outcomes were obtained by trained nurse observers. Temporal within group data analyzed by Paired-T, between group Wilcoxon with $p < 0.05$ significant.

RESULTS: Baseline oral MEQ ranged from 48-674 mg/day. Intrathecal MS doses ranged from initial doses of 0.45-7.6 mg/day to peak of 54 mg/day. The mean pain intensity report decreased at one and two months but only significantly at two months while mean Karnofsky decreased from baseline of 48.9 to 38.6 at two months.

TIME PERIOD	n	MEAN VPAS ± S.D.	n	MEQ ± S.D.
BASELINE	9	5.58 ± 2.07	7	205.3 ± 217.7
1 MONTH	9	4.20 ± 2.70	7	152.7 ± 222.0
2 MONTH	5	2.72 ± 2.52*	6	179.2 ± 304.7

* Paired-t vs Baseline p=0.026.

Mean oral MEQ decreased from baseline at both one and two months but not significantly. The decrease was significant at one month in the five patients surviving beyond two months followup. One patient had a pump failure at two weeks (due to an air lock) and was reimplanted. Stable pump flow rates were observed in the remainder of cases. No erosions, device migrations, CSF leaks, or catheter failures occurred. A raised central septum was easily accessed. DISCUSSION: The Therex implantable pump in early clinical trials provides an effective delivery system for intrathecal morphine in cancer pain patients demonstrated by 1) reduced pain reports at up to two months of therapy and 2) overall subjective excellent or good rating in 5/9 at 1 month and 4/5 surviving > 2 months.

A742

TITLE: **CRANIAL NERVES IX AND X: AN ANATOMIC STUDY**

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INTRODUCTION:
Since 1987 we have been using a newly described approach to block the glossopharyngeal nerve (GPN, cranial nerve IX) in order to obtund the gag reflex during awake laryngoscopy[1]. Local anesthetic is injected into the palatoglossal arch (anterior tonsillar pillar) at the point at which it meets the floor of the mouth and the lateral margin of the tongue. In many cases it was noted that this approach also provided anesthesia to the areas of the upper airway innervated by the internal branch of the superior laryngeal nerve (SLN, cranial nerve X). To investigate the anatomic relationship of these two nerves which are the principle mediators of protective upper airway reflexes (gagging, glottic closure), a cadaveric study was undertaken.

METHODS:
Eight cadaveric heads were bisected in the sagittal plane. Neck dissection was performed to identify the extra-pharyngeal portion of the GPN as it penetrated the pharyngeal wall at the upper border of the middle pharyngeal constrictor. The extra-pharyngeal portion of the SLN was identified as it penetrated the hyothyroid membrane. The hemi-head was then turned over and the mucosa covering the floor of the palatine tonsillar fossa was excised, along with contiguous portions of mucosa extending into the pyriform sinus medially and mucosa forming the glossopharyngeal arch and the floor of the mouth anteriorly. This dissection exposed the SLN as it traversed the floor of the pyriform sinus; removal of loose adventitial tissue exposed the GPN as it traversed the floor of the palatine tonsillar fossa and inserted into the base of the tongue. Identification of both nerves was confirmed by documentation of continuity with the previously identified extra-pharyngeal portions.

RESULTS:
The dissections revealed that the intra-pharyngeal portions of the GPN and SLN are in the same tissue plane and are separated only by loose adventitial tissue. The closest proximity of the nerves to each other is 2.5 cm. The SLN is approximately 3.5 cm from the injection site for GPN block.

DISCUSSION:
This investigation shows that the GPN and the SLN share a common tissue plane within the peri-pharyngeal structures, an anatomical relationship not discussed in any of the standard anatomy texts. This accounts for our ability to block both the GPN and the SLN with a single injection, a technique not previously described. Clinically, an injectate volume of 2.5 ml (using 1% lidocaine) was associated with a 99% efficacy in blockade of the GPN but unpredictable efficacy in terms of SLN block[1]. A volume of 5 ml appears to provide consistent blockade of both nerves. This differential volume requirement is consistent with the measured distances of the specific nerves from the site of injection; the GPN is 1-2 cm away while the SLN is 3.5 cm away.

In addition to contributing to our understanding of the intraoral approach to blockade of the GPN and SLN, this anatomic study suggests the possibility of being able to block both nerves simultaneously via an external approach through the hyothyroid membrane. Since the two nerves share a common tissue plane, it would appear to be primarily a question of volume and patient position.

REFERENCES:
1. Woods AM, Lander CJ: Anesthesiology 67:A220, 1987