

Title: THE USE OF CONTINUOUS LUMBAR EPIDURAL FENTANYL FOR POST OPERATIVE PAIN RELIEF IN ABDOMINAL AORTIC ANEURYSMS

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**Introduction.** Opioids have been shown to be an effective analgesic when administered in the epidural space. Morphine has several disadvantages including delayed respiratory depression, and a high incidence of nausea, vomiting and pruritis.<sup>1</sup> Fentanyl citrate has also been shown to be an effective analgesic when administered in the epidural space. Its onset is rapid which makes it an easily titratable drug. Because its duration of action is short (3 hrs)<sup>2</sup>, it is frequently given as a continuous infusion. Welchew<sup>3</sup> demonstrated its effectiveness in upper abdominal surgery using a continuous thoracic epidural. Since lumbar epidural catheter insertion is a technique in which most anesthesiologists are skilled, we undertook this study to evaluate the effectiveness of continuous fentanyl lumbar epidural administration for post operative analgesics.

**Methods.** The protocol was approved by our Institutional Review Board and informed consent was obtained from each patient. Eight patients scheduled for abdominal aortic surgery had a lumbar epidural catheter inserted preoperatively at the L3-4 or the L4-5 interspace. All fentanyl concentrations were at 10 ug/ml<sup>3</sup>.

Upon emergence from anesthesia, the patient was bolused with 50 ug Fentanyl (which was repeated in 20 minutes if needed) and started on a continuous infusion of 80 ug/hour. The dose was titrated to patient comfort which was determined by the patient being able to cough, deep breath, and elevate their arms with minimal increases in discomfort compared to their resting state. Arterial blood gases were initially done Q 4Hr and 20 minutes post any infusion rate change then shifted to Q 8Hr when the infusion rate was constant for 6 hrs. Visual analog pain scale (0=no pain:10 maximal pain) was evaluated every 8 hrs for the first 32-72 hours on six patients.

Data were analyzed using paired comparisons T test. A P-value of less than 0.05 was considered significant.

**Results.** Table one shows respiratory measurements of patients. Table two shows fentanyl infusion rates with visual analog pain scores. pH ranged from 7.36-7.44 with PCO<sub>2</sub> ranging from 25-45 Torr except in patient 6, who was a CO<sub>2</sub> retainer with a resting PCO<sub>2</sub> of 50 torr. Respiratory rates varied from 12-24 and were unlabored. Fentanyl infusion rates varied from 80-130 ug/hr with all but one ranging from 80-100 ug/hr. Visual analog pain scores ranged from 1-4 during infusion and from 5-8 after discontinuance of infusion.

Table 1 Respiratory Measurements

Patient	Arterial Blood Gases	PCO <sub>2</sub>	Respiratory
1	7.36-7.38	43-45	18-24
2	7.36-7.40	43-44	12-20
3	7.44-7.48	35-41	12-20
4	7.36-7.39	39-46	12-20
5	7.36-7.39	40-45	16-24
6	7.43-7.44	50-55	16-20
7	7.40-7.42	40-42	12-18
8	7.38-7.40	40-44	16-22
Range	7.36-7.44	35-45*	12-24

\* Patient five excluded

Table 2 Infusion rates and pain scores

Patient	Stable State Fentanyl infusion (ug/hr)	Visual analog with infusion	Pain score post infusion
1	100	-	-
2	100-130	-	-
3	100	3-4	7*
4	100	2-4	5
5	80	2-3	8*
6	80	2-3	7*
7	100	3-4	6
8	80	1	5
Range	80-130	1-4	5-8+

\* Patient infusion discontinued at 24 hours when they were transferred from I.C.U.

+ P < 0.001 when compared to infusion group

**Discussion.** Continuous lumbar epidural infusion is an effective and safe way to administer fentanyl for postoperative analgesia in upper abdominal surgery. All PH's were maintained above 7.35 and PCO<sub>2</sub> were below 46 torr except for patient 6 whose PCO<sub>2</sub> was within 5 torr of their resting state. Titration of pain management is relatively easy since dosage ranges are narrow and fentanyl's onset of actions is rapid<sup>4</sup>. This allows optimal pulmonary toilet with maximal patient compliance. With the short duration of actions of Fentanyl<sup>2</sup>, bed management in the I.C.U. is much easier since patients do not need to be kept for prolonged periods of time post drug injection.

#### References.

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