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TITLE: PATIENT CONTROLLED ANALGESIA (PCA)
FOR EXTRACORPOREAL RENAL SHOCK WAVE
LITHOTRIPSY (ESWL):
A PROSPECTIVE STUDY

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INTRODUCTION: Newer generation lithotriptors (HM-4 and DHSI-HM4) have somewhat simplified the administration of anesthesia for ESWL; however, significant pain during the procedures remains a problem. Our study was designed to test the feasibility of using PCA as a sole anesthetic modality for ESWL. To our knowledge there have been no reports in the literature on the use of PCA for ESWL when the Dornier, HM-4 (immersion free) system with 80nf generator was used.

METHODS: Following approval of the Institutional Review Board and obtaining informed consent, 62 patients, ASA I-III, with renal stones undergoing ESWL (without cystoscopy) were randomized prospectively into two groups. Control group patients (n=29) received analgesia with continuous infusion of alfentanil administered by three anesthesiologists not other wise involved in the study. The PCA group patients (n=33) self-administered alfentanil (in addition to a low continuous background infusion, 10-40mcg/min) using the Abbott LifeCare 4100 PCA pump. During ESWL at 800 shock wave intervals we measured: blood pressure, pulse, respiratory rate, Sat O₂, ETCO₂ (via nasal prongs), and pain and sedation levels (scale 0-4). At the end of each case, both patient and urologist satisfaction were rated and the duration of stay in the recovery room was calculated.

RESULTS: Patients in the PCA group required 31% less alfentanil than the patients in the control group (53 vs 76.8mcg/min, p<0.0001). The baseline alfentanil infusion rate was 2.3 times higher in the control group; however, these patients required a lower number of additional alfentanil bolus doses for supplemental analgesia (p>0.05). Pain control was very good in both groups (pain ranged from none to mild) and was not statistically different between groups. Patients in the control group were more sedated throughout the procedures (P<0.001). Blood pressure, heart rate, Sat O₂, and ETCO₂ were not significantly different between groups. Eighty percent of patients and 95% of the urologists in the PCA group were "very pleased" with pain management compared to 88.5% (p>0.3) and 95% respectively in the control groups. Ninety-four percent of the study patients (compared to 96% in the control group) receiving PCA stated that they would like to have the same method of analgesia if offered a choice in the future. Recovery room stay was not statistically shorter in the PCA group, 19.4 vs 23.2 minutes (p>0.3).

CONCLUSION: Pain associated with ESWL, using second generation of lithotriptors, can safely and effectively be managed by the use of PCA which decreases narcotic requirements and intraoperative sedation and simplifies ESWL as an outpatient modality.

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Title: THE EFFECT OF EPIDURAL BLOCKADE ON
POST-OPERATIVE HYPERCOAGUABILITY

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INTRODUCTION: Major surgery often results in post-operative hypercoaguability due to increases in clotting and anti-fibrinolytic factors^{1,2}. The aim of the current study was to examine the effect of thoracic epidural blockade on post-operative increases in fibrinogen, factor VIII coagulant (VIIC), and α_1 -antitrypsin, following elective abdominal aortic surgery.

METHODS: 16 patients undergoing elective abdominal aortic reconstruction were randomized into 2 groups. Group 1 received general anesthesia (GA) with pentothal-N₂O-opiate-muscle relaxant-volatile agent and iv. opiate analgesia post-operatively. Group 2 received GA as in group 1 plus thoracic epidural anesthesia (upper level T4) with bupivacaine 0.5%. In group 2 post-operative analgesia was maintained with epidural bupivacaine 0.1% (8-10ml.hr⁻¹) for up to 48 hrs. Plasma fibrinogen, factor VIIC, and α_1 -antitrypsin were measured pre-operatively and on days 2 and 4 post-operatively. In each group post-operative values were compared to pre-operative controls using one-tailed paired t tests. The values between the groups were compared using two-tailed t tests. P values <0.01 were considered significant.

RESULTS: Both groups were similar in regard to age, weight, duration of surgery, and operative blood loss. In each group there were significant increases in fibrinogen, factor VIIC, and α_1 -antitrypsin (fig.). However, there were no significant differences between the groups in any of the factors (fig.)

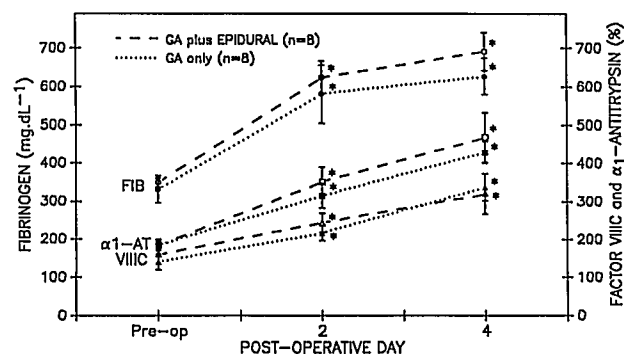


FIGURE. Changes in fibrinogen (FIB), factor VIIC, and α_1 -antitrypsin (α_1 -AT) post-aortic surgery. Bars indicate mean \pm SEM. *P<0.01 vs pre-operative control.

DISCUSSION: Previous studies have shown that following major surgery there are increases in clotting and anti-fibrinolytic factors^{1,2}. Fibrinogen and factor VIIC are important clotting factors, and α_1 -antitrypsin is a major anti-fibrinolytic factor². Our results demonstrate that there are large increases in these factors following aortic surgery. However, we found that the increases were similar in patients receiving GA alone, and in those receiving GA plus epidural blockade. This suggests that intra-operative epidural blockade does not prevent the hypercoaguability response to surgery.

REFERENCES: 1. Am J Surg 133:612-616, 1977
2. Surg Gynec Obstet 144:673-676, 1977