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Case Report Acta Medica Anatolia
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Epidural Anesthesia in a Patient with High Cardiac Risk

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Abstract

Cardiac morbidity is the most common cause postoperative mortality furthermore anesthesia technics are associated with cardiac morbidity and mortality. A 48-year-old male, 90 kg, ASA physical status IV patient underwent femoropopliteal bypass under epidural anesthesia. Comorbidities included atrial fibrillation, dilated cardiomyopathy and 20% left ventricular ejection fraction. Epidural anesthesia was established with bupivacaine and fentanyl at L3-L4 intervertebral space. Hemodynamic stability and pain relief were established during and after the surgery. We consider that epidural anesthesia is preferable as an alternative regarding the risks of spinal anesthesia and general anesthesia for high cardiac risky patients.

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Introduction

Cardiac morbidity is the most common cause postoperative of mortality and the incidence of perioperative cardiac morbidity is 10 times greater in vascular surgery patients than in nonvascular surgery patients (1). Furthermore anesthesia technics are associated with cardiac morbidity and mortality. Since perioperative sympathetic activation plays a causative role in the development of myocardial ischemia and infarction, inhibition of this activation would be expected to reduce cardiac morbidity (2). Ejection fraction is a measurement of pumping capacity of ventricle. The measurement of left ventricular ejection fraction (LVEF) has been known as associated with postoperative morbidity and mortality (3,4). Perioperative epidural anesthesia-analgesia utilizing a local anesthetic-based regimen clearly provides some physiologic benefits which may potentially translate into decreased perioperative pulmonary, cardiac, and gastrointestinal morbidity (5).

In this case, we discuss the epidural anesthesia experience of a patient with high cardiac risk (EF20%) regarding literature review.

Case

A 48-yr-old male, 90 kg, ASA physical status IV patient with history of hypertension and thirty years of cigarette usage underwent femoropopliteal bypass under epidural anesthesia. After preoperative cardiology counselling atrial fibrillation, cardiomyopathy and %20 ejection fraction were determined. Therefore the patient was assessed high risky for vascular surgery. Warfarin treatment is is stopped 5 days preoperative, and administered therapeutic-dose bridging with low molecular weight heparin (LMWH) preoperative and postop. Preoperative all laboratory studies were within normal range. After 12 hours then administration of LMWH, the patient is admitted to operation room. The patient was connected to standard monitors that included pulse oximetry (SPO2), electrocardiogram (ECG), and invasive arterial blood pressure. 20 G intravenous cannula was inserted. Consequently, patient was given %0.9 NaCl isotonic solution immediately prior to epidural anesthesia for prehydration. With the patient in the sitting position, the lumbar area was disinfected with a solution of 10% povidone-iodine. Under strict aseptic precaution, skin was infiltrated with 2% plain lidocaine. An 18-gauge Tuohy needle was introduced at L3-L4 intervertebral space. Epidural space confirmed by loss of resistance technique via midline approach. An epidural catheter was inserted 5 cm into the epidural space. After giving test dose of 3 ml 2% lidocaine, negative aspiration for cerebrospinal fluid and blood, 20 G Epidural catheter was threaded up and fixed to skin. Total of 10 ml of 0.5% plain Bupivacaine and 50 mcg fentanyl was given via epidural catheter incrementally. After withdrawal of the Tuohy needle, the patient was placed supine. There was no pain or paresthesia during needle placement or drug injection. Twenty minutes after bupivacaine administration, the sensory level block was bilateral symmetric, and caudal to T10, as assessed using the pinprick method. In addition 5 ml of 0.5% plain bupivacaine was given after 2 hours of starting bolus dose. Intraoperative

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total intra venous fluids were 2500 ml of crystalloids and 500 ml of colloids. Total urine output was 500 ml. The estimated blood loss was 100 ml. The 240-min surgical procedure was conducted uneventfully. Throughout the procedure, patient's arterial blood pressure remained normal. At the end of the surgery the patient was transported to the postanesthesia care unit (PACU) and postoperative monitored during 45 minutes. In second postop day the epidural infusion was discontinued and according with surgery team, before 6 hours then LMWH dose, catheter is removed. Postoperative 10th day, the patient discharged from hospital uneventfully.

Discussion

Epidural anesthesia; in addition to a safe startup, provides advantages such as prolongation of the duration of the anesthesia, low rates of side effects according to the use of low drug doses, a faster mobilization and control of postoperative pain (6). Cardiac morbidity is the most common cause of death in patients undergoing surgery (7). Epidural anesthesia, whether adjuvant to general anesthesia or not, has better analgesia and pain control, decreased patient stress resulting diminished hemodynamic needs of the heart and myocardial oxygen consumption, advantages like eliminating the potential complications of general anesthesia as prolonged ventilation, myocardial depression, prolonged ileus (8). Moracca et al. (2) stated a significant reduction in the perioperative cardiac morbidity (30%), pulmonary infections (40%), pulmonary embolism (50%), ileus (2 days), acute renal failure (30%), and blood loss (30%) by using an epidural technique. Gold et al (9) also compared catecholamine release in patients undergoing abdominal aortic aneurysm repairs randomized to lumbar epidural or general anesthesia. They reported a large increase in serum catecholamine levels in the general anesthesia group but not in the epidural group. Christopherson R (10) et al. suggested epidural anesthesia in patients undergoing lower extremity vascular surgery with inadequate tissue perfusion. Eighty patients were randomized to epidural bupivacaine/fentanyl anesthesia/analgesia or general anesthesia plus IV-PCA analgesia groups. There were fewer episodes of congestive heart failure and myocardial infarction in the epidural patients. These authors also reported a dramatic reduction in vascular graft occlusion, as well as a significant difference in thromboelastographs between groups, a finding suggesting that general anesthesia patients were hypercoagulable, whereas the epidural group maintained normal coagulation. Another prospective randomized study comparing 100 patients undergoing infra-inguinal revascularizations reported significant differences in vascular graft occlusions in the epidural versus the general anesthesia groups. Arık et al (11) investigated the effects of local anesthetic (LA) given in a single or fractioned dose on hemodynamics during epidural anesthesia applied to risky patients and they concluded that the fractioned application of LA during epidural anesthesia in the old patient with cardiac risks may progress more stable in relation to hemodynamics. Authors reported the change in hemodynamic parameters of the patients was found to be more pronounced in the group with lower ejection fraction. Dobrucalı et al (12) shared their unilateral spinal anesthesia experience in an ASA IV E patient with ejection fraction 28% and reported hemodynamic stability.

In this case we did not consider general anesthesia application due to patient's low EF value. We thought to apply spinal anesthesia but we decided not to use this method because of the increased risk of hypotension and the unestimated time of the operation process. Therefore we preferred epidural anesthesia for the high risky patient considering the administration of heparin treatment. During the operation, the stability was achieved and we did not observe complication.

Conclusion

In conclusion, we believe that epidural anesthesia is preferable as an alternative regarding the risks of spinal anesthesia and general anesthesia for high risky cardiac patients.

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