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Research Article

Continuous spinal anesthesia for elderly patients with cardiomyopathy undergoing lower abdominal surgeries

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KEYWORDS

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Abstract *Background:* Anesthetic management, of patients with cardiomyopathy with reduced systolic function, is challenging and may be associated with high mortality. Continuous epidural anesthesia (CEA) is generally accepted as the routine method of regional anesthesia for vascular surgery of the lower limb.

Continuous spinal anesthesia (CSA) has been reported to be more rapid in action, with good sensory and motor block, fewer hemodynamic disturbance and side effects when compared to continuous epidural anesthesia (CEA), and single dose spinal anesthesia (SDSA).

Patients and methods: Forty adult patients with depressed systolic function (EF 45% or less) scheduled for lower abdominal surgeries were subjected to our study. Under full aseptic precautions subarachnoid space was accessed in the setting position by an epidural needle at L3–4 and 2 ml of hyperbaric bupivacaine (10 mg) was injected into subarachnoid space, then an epidural catheter was inserted in the subarachnoid space for 3 cm. Anesthesia was maintained by Top up doses of plain bupivacaine 0.5% 1.2 ml.

Result: There were no differences in demographic characteristics of patients, procedure's duration, and ASA physical status classification. There were no significant changes in hemodynamics throughout the procedure. Hypotension occurred in 5% of patients, bradycardia occurred in 10% of patients and arrhythmia occurred in 2.5% of patients. There were no postoperative ECG changes and postoperative Troponin was negative. There was no postoperative Neurological deficit or Post dural puncture headache.

Conclusion: We can conclude that, CSA was effective and safe technique for patients with cardiomyopathy undergoing lower abdominal surgeries.

1. Introduction

Patients with cardiomyopathy are increasing nowadays as a result of advance in the facility of diagnosis and increase in

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the numbers of aging people. This type of patients may present for anesthesia and surgery so the anesthesiologist must understand the pathophysiology of this type of disease for better management and better patients outcome.

Dilated cardiomyopathy (DCM) is defined by the presence of (a) fractional myocardial shortening $<25\%$ and/or ejection fraction $<45\%$ and (b) left ventricular end diastolic diameter $>117\%$ excluding any known cause of myocardial disease. LV ejection fraction of $\leqslant 35\%$ is considered to be an optimal predictor of postoperative cardiac events [1,2].

Anesthetic management of patients with severe cardiomyopathies is associated with a high morbidity and mortality [3] and therefore requires careful planning, preparation and monitoring [4]. The preoperative preparation of these patients must be meticulous as they have minimal or no cardiac reserve. Any decrease in myocardial contractility, heart rate, or vasodilatation can cause profound hypotension. Preoperatively, patients tend to be dehydrated, as most of patients on diuretic therapy, a further cause for hypotension during anesthetic care. Preoperative hydration may not be desirable as it may lead to congestive heart failure. Fluid management is critical, and also the hypovolemic state is prudent. Therefore a vasopressor was used to overcome the vasodilating effect of the anesthesia [1].

Arrhythmias occur when potassium or magnesium levels are decreased. These electrolytes should be measured preoperatively and corrected as necessary [5].

Continuous epidural anesthesia (CEA) is generally accepted as the routine method of regional anesthesia for vascular surgery of the lower limb. However continuous spinal anesthesia (CSA) has been reported to be more rapid in action, good sensory and motor block, with fewer hemodynamic disturbance and side effects, when compared to Continuous epidural anesthesia (CEA), and single dose spinal anesthesia (SDSA) [6,7].

1.1. Aim of the study

The aim of the present study was to evaluate the safety of continuous spinal anesthesia (CSA) in patients with cardiomyopathy underwent lower abdominal surgeries as regard to changes in hemodynamic, the vasopressor use, surgeon and patients satisfaction.

The primary outcome is the hemodynamic changes while surgeon's and patient's satisfaction was the secondary outcome.

2. Patients and methods

This study was carried out on Forty adult patients with depressed systolic function (EF 45% or less) scheduled for lower abdominal surgeries in Tanta University Hospitals for 9 months after approval from the medical ethical committee (approval code: 30124/03/31) and written informed consent from the patients.

All patients' data were confidential with secret codes and were used for the current study only.

Any unexpected risk appears during the course of the study was cleared to the patients and the ethical committee on time and the proper measures were taken to minimize or overcome these risks.

2.1. Exclusion criteria

Patients refusal, morbid obese, tight mitral or aortic stenosis, patients on anticoagulant therapy, coagulopathy, history of allergy to drugs used, local infection in the puncture area, and severe deformity of the spinal column.

2.2. Preoperative preparation

All patients underwent preoperative assessment by history taking, physical examination and laboratory investigations which include complete blood count, liver function, renal function, random blood sugar, prothrombin time, INR, ECG, blood group, chest X-ray echocardiography, and serum electrolyte.

2.3. Premedication

All patients received 150 mg ranitidine and 10 mg of metoclopramide one hour before anesthesia. All cardiac medications were continued till time of surgery.

2.4. Intraoperative management

The procedure was explained to the patients during the preoperative visit. Patients were fasted for 8 h before the time of operation. On arrival to operating room an intravenous line was inserted and the patients were attached to monitor displaying the following: ECG, invasive blood pressure, noninvasive blood pressure, pulse oximetry, heart rate, O_2 saturation and urinary catheter for urine output monitoring.

Central venous catheter was inserted through right internal jugular vein for fluid and drugs infusion and to measure the CVP. Arterial line was inserted for invasive blood pressure monitoring.

2.5. Anesthetic management

Under full aseptic precautions the skin was cleaned with an antiseptic solution, and the subcutaneous tissues and muscles are infiltrated with 3 ml of lidocaine 2%. Subarachnoid space was accessed in the setting position by an epidural needle at L3–L4 and 2 ml of hyperbaric bupivacaine (10 mg) was injected into subarachnoid space, then a epidural catheter was inserted in the subarachnoid space for 3 cm. After confirming a correct position of the catheter by seeing CSF leak, the catheter was connected to adopter and bacterial filter and was secured in position making sure that it is not kinked. Anesthesia was maintained by Top up doses of plain bupivacaine 0.5% 1.2 ml (as 0.2 ml would be retained in the catheter), given every hour to maintain the sensory at T10.

The level of the sensory blockade was tested using pinprick tests. If analgesia at level T12 was not achieved within 20 min, additional bupivacaine 1.2 ml was administered through the catheter.

Motor block was assessed with modified Bromage scale (0 = no block, 1 = inability to raise the extended leg, 2 = inability to flex the knee and 3 = inability to flex the knee and foot) and surgery was began when the modified Bromage score was 2 or 3.

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