

Case Report

Intraoperative cardiac arrest during radical vulvectomy under combined spinal-epidural anesthesia: First among 2500 malignant cases in a single center

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Abstract

Complications which were related either to radical vulvectomy or to lymphadenectomy have mostly developed in post operative period. Here, we report an intra-operative cardiac arrest case during radical vulvectomy which is under combined spinal and epidural anesthesia. A 78 year-old female patient underwent radical vulvectomy under spinal anesthesia with a diagnosis of vulvar cancer. Intraoperative cardiac arrest developed and after immediate cardio-pulmonary resuscitation, sinus rhythm was restored. Cardiac arrest due to spinal anesthesia is a rare complication with the incidence of 0.063%. Despite, vulvar surgery is known as a relatively safe procedure for complications like cardiac arrest, maximum care should be given both before and during the operation. It can be described as "once in a life" experience for a surgeon and instant decisions for the management of this condition will be life saving or mortal.

Key words:

Vulvar cancer, cardiac arrest, CPR, spinal anesthesia, radical vulvectomy

Introduction

Carcinoma of the vulva is a rare disease and accounts for only 3–5% of all gynecologic malignancies [1]. Most of the vulvar carcinomas have squamous cell origin [2]. Radical vulvectomy with en bloc inguinofemoral lymphadenectomy with classic butterfly incisions is the most common procedure for treatment [3]. Complications were related either to radical vulvectomy or to lymphadenectomy which were mostly developed in post operative period. The most common complication was wound infection and breakdown [4]. Intra-operative complications are rare. In spite of the age and general medical condition of the most patients with vulvar cancer, the surgery is usually remarkably well tolerated [5].

The largest prospective studies designed to evaluate the incidence of complications during spinal anesthesia reported 26 arrests in 40,640 patients for an overall incidence of seven arrests for every 10,000 (0.07%) spinal anesthetics and one cardiac arrest for every 10,000 cases (0.01%) recently reported for epidural anesthesia [6].

Another review revealed three arrests from any cause for every 10,000 cases (0.03%) reported for patients undergoing noncardiac surgery with spinal anesthesia [7].

Here, we report an intra-operative cardiac arrest case during radical vulvectomy which is under combined spinal and epidural anesthesia. According to our literature review, it is the first intraoperative cardiac arrest case in radical vulvectomy procedure in literature and it is the first case in Zekai Tahir Burak Women Health Education and Research Hospital Oncology Department among approximately 2500 malignant cases.

Case presentation

A 78 year-old female patient was attended to oncology department with a complaint of vulvar itching. She was diagnosed with squamous cell carcinoma of vulva after vulvar biopsy. Radical vulvectomy was planned to the patient. According to patient's history and pre-operative evaluation she had arterial hypertension and diabetes mellitus type 2, receiving metoprolol succinate, valsartan and metformin for each, respectively. She had a broken forearm which occurred in a house accident three months ago and treated regularly in hospital. She had had a coronary angiography three years ago which was reported as normal. Atrial fibrillation was detected in pre-operative ECG evaluation. Her pre-operative laboratory evaluation was within normal

Article history:

Received: 16 01 2014

Accepted: 21 01 2014

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range including glucose levels. Under these circumstances the patient was classified as ASA PS (American Society of Anesthesiologists physical status) III by the anesthesiologist.

Combined spinal and epidural anesthesia was induced by using 10 mg. intrathecal heavy Bupivacaine from L3-L4 level. Intra-operative vital signs and sPO₂ values were normal. During the radical vulvectomy in the 10th minutes of surgery, the patient was mentioned pain and after the test dose (3 ml. 2% Lidocaine and 15 mcg Adrenaline) 10 ml. 0,25% Levobupivacaine and 100 mcg phentanyl were administered from epidural catheter. Just after the skin incision was finished in the 60th minutes of surgery bradycardia in sinus rhythm developed. (Pulse rate: 40 beats/minute) Within a few seconds asystole was determined in the electrocardiography. Palpation of the carotid artery revealed no signs of circulation. Thus, external chest compressions were started by the surgeon, and, at the same time, patient was intubated and 100% oxygen was delivered and 1mg of adrenaline and 0.5 mg atropine were administered intravenously. After 10 seconds of chest compression, sinus rhythm of 160 beats/minute was restored. After a minute of sinus rhythm ventricular fibrillation was developed. By 3 times defibrillation with 360 joules charged defibrillator, the sinus rhythm was restored again. Lymph node dissection and closure of the surgical site was performed by the surgeon as soon as possible. During the surgery close intra-arterial monitorization and jugular vein catheterization were performed by the anesthesiology team. For post-operative follow-up patient was monitorized in intensive care unit. Post-operative cardiac enzymes were within normal ranges, echocardiography revealed LVEF>55% and 1st degree mitral regurgitation. Final pathology of the patient revealed stage IIIA squamous cell vulvar cancer with clear surgical margins. After 10 days of follow up and recovery period, the patient was discharged and referred to a radiation oncology department for consultation.

Discussion

Intra-operative cardiac arrest is an uncommon and unexpected condition that is encountered in operation rooms especially in non-cardiac surgeries. In a prospective study designed to evaluate the incidence of complications during spinal anesthesia, 26 arrests in 40,640 (0.063%) patients were reported [6]. In the same study incidence of arrest cases for patients undergoing non-cardiac surgery reported as 0.03%. Sandove *et al.* reported that cardiac arrests under spinal anesthesia occurred in healthy young

adults [8]. Similar designed studies claimed that advanced age and high ASA PS values increases the incidence [9].

Causes of cardiac arrests during operation have a huge variety. Intra-operative hemorrhage, thromboembolic events, cardiac events (myocardial infarction), sepsis, anesthesia are the most common known reasons [10]. Intra-operative hemorrhage in gynecologic oncology usually occurs in open abdominal surgery just as in cervix, endometrial or ovarian cancer surgery. Expected blood loss in a radical vulvectomy procedure is defined as approximately 1000 cc. This amount of blood loss is not efficient to imbalance the circulatory system. Among regional anesthesia dependent reasons for cardiac complications, sympathetic efferent blockage effect of the medication is the most accused reason. A more important effect of the inhibition of the sympathetic efferents during spinal or epidural anesthesia is a significant decrease in venous return to the heart that decreases the preload [11]. If increased vagal tone due to decrease in preload is the cause of cardiac arrest after spinal anesthesia, the process should begin with minor slowing of the heart rate just in our case. To prevent this kind of complications, maintaining adequate preload is the key if spinal anesthesia has been selected for a anesthesia. Rare reason for intra-operative cardiac arrest is fat embolism which occurs mostly in orthopedic surgeries. In our case, history of forearm fracture should be considered as a probable cause of fat embolism.

As we described above, both anesthesia and surgical process are known as a hardly challenge. A lot of risk factors coalesce and increase the risk of the surgery. Careful pre-operative investigation may help to diagnose the risk factors and give chance to both surgeon and anesthesiologist to take precautions before operation. Nevertheless, half of the cardiac arrests in non cardiac surgeries are unavoidable [12]. In that situation, early intervention and appropriate management play a critical role. Early detection of the problem and its probable causes, early initiation of chest compression, cooperation of anesthesiology and surgical team define the prognosis of the crisis. Despite, vulvar surgery is known as a relatively safe procedure for complications like cardiac arrest and incidence of this situation is extremely low under spinal anesthesia, maximum care should be given both before and during operation. It can be “once in a life” experience for a surgeon and instant decisions for the management of this condition will be life saving or mortal.

Conflict of interest statement

The authors declare no conflict of interest.

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