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CASE REPORT

Successful anesthetic management in axillo-axillary bypass surgery

Aksillo-aksiller bypass cerrahisindeki başarılı anestezi yönetimi

Dilek ALTUN,[1] Özlem ÇINAR,[1] Emre ÖZKER,[2] Ayda TÜRKÖZ[3]

Summary

Axillo-axillary bypass grafting is considered the operation of choice for patients with subclavian steal syndrome. Anesthetic management of high-risk patients with coronary-subclavian steal syndrome presents safety and technical challenges. Presently described is case of chronic obstructive lung disease and coronary artery disease in a 52-year-old man who required axillo-axillary bypass surgery to treat stenosis at the origin of left subclavian artery. Successful anesthetic management was achieved for patient undergoing axillary-axillary bypass surgery using a cervical epidural technique.

Keywords: Axillo-axillary bypass; cervical epidural anesthesia; coronary-subclavian steal.

Özet

Aksillo-aksiller baypas, subklavyen çalma sendromu olan hastalarda tercih edilen bir cerrahi işlemdir. Koroner-subklavyen çalma sendromu olan yüksek riskli hastalarda anestezi yönetimi güvenlik ve teknik açıdından zorluklar getirmektedir. Bu olgu sunumu, sol subklavyen arter kökünde darlık nedeniyle aksillo-aksiller baypas tedavisi gerekli olan kronik obstrüktif akciğer hastalığı ve koroner arter hastalığı olan 52 yaşındaki bir erkek hastayı tanımlamaktadır. Burada, servikal epidural anestezi tekniği kullanılarak aksillo-aksiller baypas cerrahisi geçiren hastadaki başarılı anestezi yönetimini sunduk.

Anahtar sözcükler: Aksillo-aksiller baypas; servikal epidural anestezi; koroner-subklavyen çalma sendromu.

Introduction

Coronary-subclavian steal syndrome results from atherosclerotic disease of the proximal subclavian artery causing reversal of flow in an internal mammary artery used as conduit for coronary artery bypass. Axillo-axillary bypass procedure is technically easy to perform, can be done rapidly, and has not been associated with any significant morbidity.[1]

Axillo-axillary bypass surgery can be performed under either general or regional anesthesia. Published data regarding mortality and morbidity has not established the superiority of one technique over the other.[2,3] General anesthesia has usually been advocated because of certain advantages, including the ability to control the patient's ventilation and the avoidance of the potential hazards of airway obstruction and agitation in an uncooperative patient.[4] Regional anesthesia is attractive and gaining popularity because of early weaning and reduced pulmonary complications in the postoperative period, better intraoperative hemodynamic stability in patients with coronary-subclavian steal syndrome.[5,6]

Here, we have reported the successful anesthetic management using a cervical epidural technique in a

[1]Department of Anesthesiology and Reanimation, Başkent University İstanbul Hospital, İstanbul, Turkey
[2]Department of Cardiovascular Surgery, Başkent University İstanbul Hospital, İstanbul, Turkey
[3]Department of Anesthesiology and Reanimation, Emsey Hospital, İstanbul, Turkey

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Correspondence: Dr. Dilek Altun. Altunizade Mh., Kısıklı Cad., Oymacı Sok. No: 7, 34662, İstanbul, Turkey.
Phone: +90 - 216 - 554 15 00 **e-mail:** drdilekaltun@hotmail.com

coronary-subclavian steal syndrome patient undergoing axillo-axillary bypass surgery.

Case Report

A 52 year old, 69 kg, ASA III male patient was admitted to the emergency department with the complaint of chest and arm pain at rest. His previous medical history included chronic obstructive lung disease (FEV1.0 (Forced Expiratory Volume in 1 second): 38%) and coronary artery disease. He had undergone a previous coronary artery bypass graft surgery (CABG) five years ago. The patient underwent noninvasive duplex ultrasonographic scanning and angiographic evaluations. High rate stenosis at origin of left subclavian artery, diagnosis was confirmed and he has undergone for the axillo-axillary bypass surgery.

After premedication with midazolam (2 mg i.v.), the patient was admitted to the operating room. As part of routine practice; noninvasive blood pressure, pulse-oximetry, and electrocardiography were monitored continuously. In addition to standard monitoring, sedation level monitored with Index of Consciousness (IOC) (Morpheus Medical, Barcelona, Spain) and regional oxygen saturation was monitored with FORE-SIGHT Cerebral Oximeter (CAS Medical Systems, Branford, CT, USA), which provides dual-site monitoring using adult disposable sensor and invasive right arterial pressure was also monitored.

We planned to perform regional anesthesia, cervical epidural blockage for the patient. The patient, whose coagulation profile was normal, positioned in sitting. The cervical epidural space was identified with an 18-gauge Tuohy epidural needle, at the C7-T1 interspace using the loss of resistance (LOR) technique via a midline cephaled approach. After negative aspiration, the catheter was inserted. A 19-Gauge end-holed catheter was then introduced 4 cm into the epidural space and patient was laid supine. After test dose of lidocaine with adrenaline solution, levobupivacaine 12 ml 0.5% was administered through the catheter. The level of sensory block was tested bilaterally (defined as loss of sensation to pinprick) in an ascending fashion starting from the T10 dermatome. The degree of upper limb of motor block was assessed according to the following scale: 1-absence of motor block, 2-partial motor block (weakness appreciable

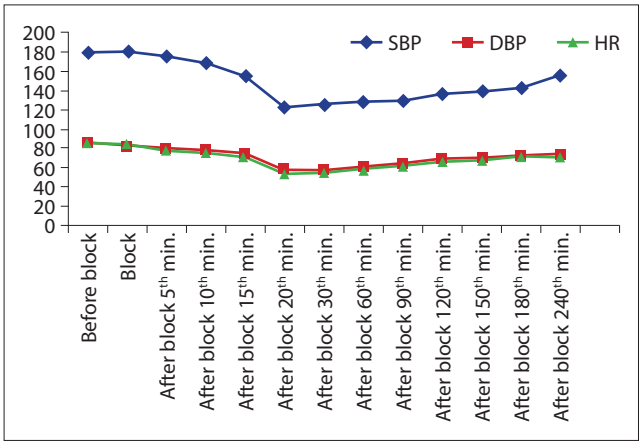

Figure 1. Heart rate (HR), systolic arterial pressure (SAP) and diastolic arterial pressure (DAP) during the operation.

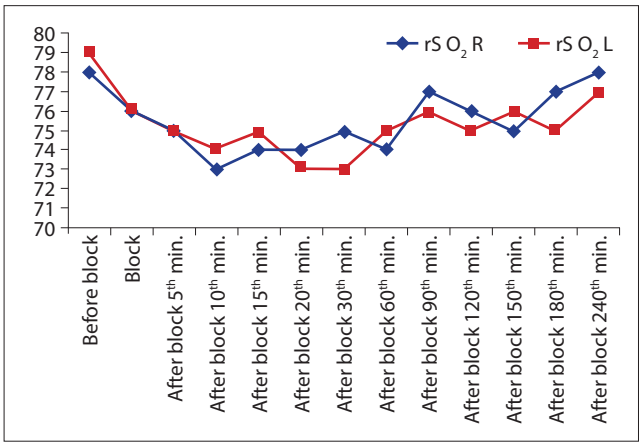

Figure 2. Changes in regional cerebral oxygen saturation.

but movement possible against resistance) 3-motor block almost complete (possible movement but not against), and 4-complete motor block (absence of movement). In the 18th minute sensorymotor block was determined between C5-T7. Heart rate and blood pressure decreased significantly from baseline one at the 20th, 30th, 60th, 90th and 120th minutes however no vasopressor agent was required in the operating room (Figure 1). Blood pressure increased to the basal rate at the end of the second hour and never decreased again. After 20 minutes post-CEA, drapes were applied and surgery started. Monitoring was carried out throughout the operation and vitals were recorded on monitors every 5 minutes and on every two hours during the stay in ICU. The patient was kept in a state of conscious sedation with midazolam (mean dose 0.04 mg/kg IV) and IOC values were within 70–80 throughout the surgery; and he received Oxygen (3-4 L/min) via a nasal cannula. Brain saturation didn't change from baseline during the surgery (Figure 2). The procedural time

was 3 hours and 45 minutes; the surgery 3 hours and 15 minutes. Only two additional top up dose (1/4rd of initial bolus) was given at the second and third hours. Postoperatively, epidural infusion has continued for 24 hours. Totally 22 cc 0.5% levobupivacain has been administered through the cathater. There was no additional analgesic requirement, and no complication (bradycardia, hypotension, diaphragmatic paralysis). The patient was discharged on good condition without any problems at the end of 20th hour of ICU stay. Postoperatively, epidural top-ups were given on complaint of the patient, when visual analog score (VAS) was ≥3, only twice (3 mL of 0.25% levobupivacaine). VAS; characterized pain status 0–10, 10 being the maximum possible-defined as the worst pain ever experienced) as used by nurse to assess the patient' pain status. At the end of 48th hour, catheter was removed.

Discussion

Coronary-subclavian steal through an internal mammary artery graft is a rare cause of myocardial ischemia in patients who have previously undergone CABG. Axillary-axillary artery bypass for the correction of subclavian artery occlusive disease can be performed under general or regional anaesthesia. Besides general anaesthesia, different regional anaesthesia techniques including cervical epidural blockage is increasingly employed for this surgery. Regional anesthesia is more cost-effective, given that less intensive care and shorter hospital stays are required.[2] General anaesthesia is the conventional method, however it is practiced less often because of the fear of potential complication.[7,8]

Goals of anesthetic management in patients with chronic obstructive pulmonary disease (COPD) should be to avoid anaesthetics that depress mucociliary transport, provide postoperative pain relief that can adequately prevent deterioration of respiratory mechanics, and ambulate the patient as early as possible. Epidural anesthesia fulfills all of these criteria and aids in the quick and uneventful recovery of these patients.[9] Our patient had COPD and FEV1: 38% since regional anesthesia would avoid the pulmonary complications of general anesthesia, we preferred to perform cervical epidural anesthesia.

Cervical epidural anesthesia results in blockade of the cardiac sympathetic fibers and consequently mildly decreases heart rate, cardiac ouput and myocardial contractility. The mean blood pressure is unchanged or decreased, depending on the peripheral systemic vascular changes. Sympathetic blockade also decreases. The respiratory effects are minimal and depend on the extent of the blockade and the concentration of the local anaesthetic. However myocardial ischemia and respiratory compromise is usually minimal. Results from several studies have shown that vasculer surgery under regional anestesia, cervical epidural anesthesia, is associated with better circulatory stability and lower morbidity and mortality rates.[5,6]

And also epidural anesthesia significantly decreases peripheral resistance and increases graft blood flow in grafts and would appear, therefore, to be of benefit for patients undergoing axillary-axillary bypass.[10–12]

Coronary-subclavian steal syndrome should be considered in patients presenting with recurrent chest pains after CABG with in situ left internal mammary grafts. Ultimately the choice of anesthetic technique is based on patient's suitability, preference of the surgeon and anesthetist's experience and expertise. Epidural administration of local anesthetics not only provides excellent anesthesia and analgesia but also improves postoperative outcome and reduces postoperative pulmonary complications, intensive care and hospitalization time compared to anesthesia and analgesia without epidural anesthesia.

The LOR technique is considered a reliable tool for cervical epidural anesthesia in daily clinical practice. The LOR failure rate for the placement of lumbar epidural catheters has been shown to be less than 10%. Use of fluoroscopy can improve the accuracy of needle placement. It has been established that fluoroscopic guidance is a useful tool for locating the epidural space.[13] Moreover, if established by skilled persons, LOR tecnique can also be a safe tecnique.

Transcranial cerebral oximetry is useful in the assessment of endovascular procedures with acute and permanent decreases in rSO_2 being closely related to vascular procedure and neurologic complications.[14] Here, we reported a patient in whom the usefulness of cerebral oxygen saturation monitoring dur-

ing axillo-axillary bypass procedure. This procedure facilitated the prediction of a sign of hemodynamic disturbance that cannot be detected using other monitoring methods. In our patient, brain saturation didnot change from baseline.

The technique of cervical epidural anesthesia with levobupicaine provided an effective sensory block and a restricted motor block, reducing the probability of the restrictive pulmonary syndrome and provided an excellent intraoperative hemodynamic stability reducing the probability of developing myocardial ischemia in our patient.

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