CASE REPORT

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Bupivacaine-Induced Kounis Syndrome

Bupivakain İlişkili Kounis Sendromu

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ABSTRACT

Bupivacaine is frequently used in daily practice for local anesthesia. The cardiotoxic and arrhythmic effects of bupivacaine are known. Acute allergic attacks and electrocardiographic changes associated with bupivacaine have not been reported in the literature. Kounis syndrome presents with the clinical picture of acute myocardial infarction following an acute allergic attack. Coronary angiography was planned for the patient, who had a known coronary artery bypass graft, with the diagnosis of unstable angina pectoris. After subcutaneous bupivacaine injection applied to the radial area, severe chest pain and electrocardiography changes occurred. No acute occlusive lesion was detected in coronary angiography. In this article, bupivacaine-associated kounis syndrome will be presented.

Keywords: Local anesthesia, bupivacaine, kounis syndrome, acute coronary syndrome, coronary angiography

ÖZ

Bupivakain, günlük pratikte lokal anestezi için sıkça kullanılmaktadır. Bupivakainin kardiyotoksik ve aritmik etkileri bilinmektedir. Literatürde bupivakain ile ilişkili akut alerjik reaksiyonlar ve elektrokardiyografik değişiklikler bildirilmemiştir. Kounis sendromu, akut alerjik bir atak sonrasında akut miyokard enfarktüsü klinik tablosu ile kendini gösterir. Koroner arter bypass grefti olan ve stabil olmayan angina pektoris tanısı konan hastaya koroner anjiyografi planlandı. Radial bölgeye uygulanan subkutan bupivakain enjeksiyonu sonrasında şiddetli göğüs ağrısı ve elektrokardiyografi değişiklikleri meydana geldi. Koroner anjiyografide akut tıkayıcı lezyon tespit edilmedi. Bu makalede, bupivakain ile ilişkili kounis sendromu sunulacaktır.

Anahtar Kelimeler: Lokal anestezi, bupivakain, kounis sendromu, akut koroner sendrom, koroner anjiyografi

INTRODUCTION

Medications given during anesthesia can act as antigens, which can trigger anaphylactic reactions. Bupivacaine, as it is known, is an anesthetic drug administered subcutaneously to provide local anesthesia to patients. Bupivacaine amide derivative is a local anesthetic agent. Hypersensitivity and anaphylaxis can be observed after bupivacaine injection. It can also cause a type 4 hypersensitivity reaction[1]. When allergy, hypersensitivity, and anaphylactoid effects occur, cardiovascular effects may manifest as kounis syndrome[2]. Kounis syndrome may present with coronary vasospasm and acute coronary syndrome[3]. In this article, we present a case of ST elevated myocardial infarction without significant anaphylaxis after subcutaneous administration of bupivacaine.

CASE REPORT

A sixty-four-year-old male patient was admitted to our emergency department with chest pain ongoing for the last three days. In his history, it was learned that he had known hypertension, hyperlipidemia, and 3 vascular coronary artery bypass grafts applied in 2018. Troponin and electrocardiography (ECG) follow-ups were performed. The patient's presenting ECG was determined as normal sinus rhythm (Figure 1A). Troponin tests were negative. However, he was admitted to our clinic with the diagnosis of unstable angina pectoris because

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he had cardiac pain which did not go away. Radial coronary angiography was planed for the patient. Before coronary angiography, local anesthesia was applied to the radial region with 3 mg bupivacaine. Then, the patient's pulse was observed to be 30 on the monitor. Concomitant feelings of deterioration, back pain, and facial flushing developed. When the measured blood pressure is 70/30 mmHg, 1 mg of atropine is applied. Afterwards, the patient developed branch-block tachycardia with a pulse rate of 150 beats/min. Then, ST elevation was seen on the ECG (Figure 1B). Femoral angiography was decided and coronary angiography was performed with local anesthesia with lidocaine. No acute total occlusion was observed in coronary bypass grafts and native vessels (Figure 2). Finally, all complaints regressed and the control troponin value of the patient was found to be 6,893. During the follow-up, medical treatment was arranged and the patient was discharged. The patient provided written informed consent for the publication of this article.

DISCUSSION

If there is a sudden onset of chest pain and allergic symptoms accompanying ECG changes, kounis syndrome should be considered. Kounis and avras first defined it as allergic angina[4]. Two subtypes have been identified. Type 1 coronary artery disease has been described in patients with normal coronary arteries without predisposing factors. Coronary vasospasm, endothelial dysfunction, or microvascular angina have been blamed for the release of allergic mediators in this type. In the other type, thrombosis was blamed for acute allergic attacks causing rupture of the existing stable plaque[5]. In our patient, type 1 kounis syndrome triggered by an acute allergic attack after bupivacaine was considered.

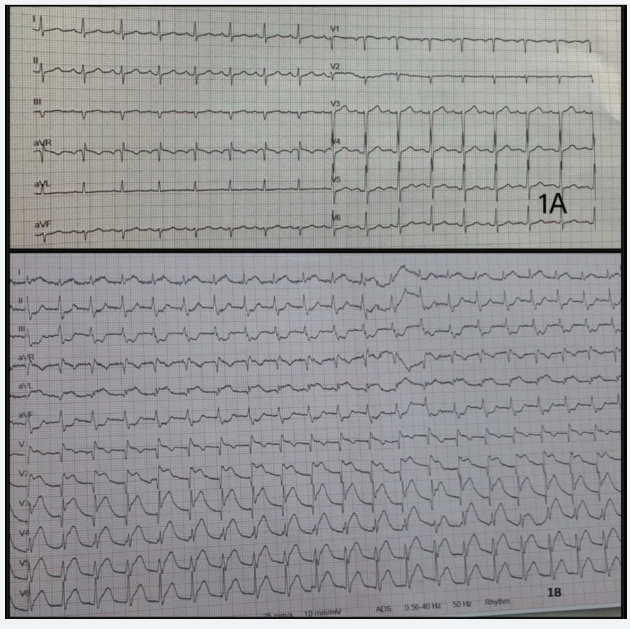

Figure 1. A) Electrocardiography at admission. B) Electrocardiography after local bupivacaine injection

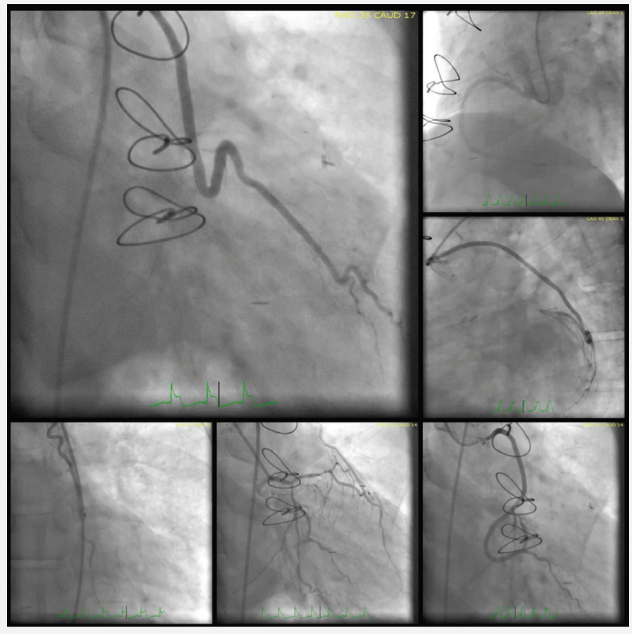

Figure 2. Coronary angiography was performed, and native coronary artery and bypass graft vessels were detected as normal

Bupivacaine is known to have a cardiotoxic effect by inhibiting voltage-gated ion channels. All local anesthetic agents have negative inotropic effects. Bupikain can cause electromechanical dissociation and severe ventricular arrhythmias in particular[6]. In this case, it has been shown that bupivacaine may cause acute chest pain, ECG change, and myocardial infarction triggered by allergy in addition to these known effects.

Local anesthetic drugs are used in many different areas. After the use of these drugs, it is necessary to take an ECG for patients with allergic symptoms with chest pain and sweating. It should be borne in mind that drugs such as bupivacaine can cause acute myocardial infarction without causing significant anaphylaxis. It is important to see the coronary anatomy in these patients. It should be anticipated that an acute allergic reaction may lead to a rupture in patients with stable plaque and they may have a myocardial infarction presenting with a thrombus.

CONCLUSION

In the literature, kounis syndrome developed against the combination of amikacin, bupivacaine and fentanyl has been reported[1]. However, no patient who developed kounis

syndrome directly due to bupivacaine has been reported. Therefore, it should be kept in mind that local anesthetics, which we frequently use and do not usually have side effects, may have situations like the one in this case.

Ethics

Informed Consent: The patient provided written informed consent for the publication of this article.

Footnotes

Authorship Contributions

Surgical and Medical Practices: E.Y., Ç.K., Concept: E.Y., Ç.K., Design: E.Y., Ç.K., Data Collection or Processing: E.Y., Ç.K., Analysis or Interpretation: E.Y., Ç.K., Literature Search: E.Y., Ç.K., Writing: E.Y., Ç.K.

Conflict of Interest: No conflict of interest was declared by the authors.

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