



(CASE REPORT)



Anesthesia management in a patient who diagnosed with brugada syndrome in third preoperative evaluation

Abdullah Yeşilkaya *, Büşra Nur Taşdelen and Ayşe Altun Gezgel

Department of Anesthesiology, Faculty of Medicine, Karabuk University, Karabuk, Turkey.

International Journal of Science and Research Archive, 2023, 10(02), 1152–1155

Publication history: Received on 13 November 2023; revised on 24 December 2023; accepted on 27 December 2023

Article DOI: <https://doi.org/10.30574/ijrsra.2023.10.2.1078>

Abstract

Brugada Syndrome (BS) is a rare genetic disease that can be fatal with malignant arrhythmias. It has been stated that drugs, which are frequently used in anesthesia practice, electrolytic or autonomic imbalance, fever, and infections can trigger cardiac arrhythm and sudden cardiac death even in asymptomatic patients. Here we describe a patient who diagnosed with Brugada Syndrome in third preoperative evaluation. A 60-year-old male patient was scheduled for an infected knee prosthesis. The patient's preoperative laboratory findings were normal except for ECG changes. There was ST segment elevation in V1 and V2 leads in the ECG. The patient was consulted with the cardiology clinic and was evaluated as Brugada Syndrome ECG type 1. There is no consensus regarding the application and technique of anesthesia for these patients. We decided to apply general anesthesia because we could provide better hemodynamic stabilization. The patient was transferred to the intensive care unit. There were no adverse events observed during the anesthetic management and discharged from the hospital on the second postoperative day.

We emphasize the importance of detailed preoperative evaluation each time, even in patients with a known anesthesia history.

Keywords: Brugada syndrome; Case report; General anesthesia; Anesthesia management; Preoperative evaluation

1. Introduction

Brugada syndrome (BS) is a rare genetic disease that can be fatal with malignant arrhythmias. BS is characterized by ST-segment elevation with a right bundle branch block (RBBB) pattern in the right precordial leads by affecting the ion channels in the heart [1].

It has been stated that drugs, which are frequently used in anesthesia practice, electrolytic or autonomic imbalance, fever, and infections can trigger cardiac a-rhythm and sudden cardiac death even in asymptomatic patients [2,3].

In this case, we aimed to present the anesthesia management of our patient, who had a Brugada-type ECG change preoperatively although he had received anesthesia twice before with a normal ECG.

2. Case Presentation

A 60-year-old male patient was scheduled for an infected knee prosthesis. His medical history reviewed peripheral artery disease. He had undergone total knee replacement surgery one year ago.

* Corresponding author: Abdullah Yeşilkaya

The patient's preoperative laboratory findings were normal except for ECG changes. There was ST segment elevation in V1 and V2 leads in the ECG (figure 1). The patient was consulted with the cardiology clinic and was evaluated as Brugada Syndrome. The patient has neither cardiac complaints nor a family history of sudden cardiac death. A detailed explanation was given to the patient and consent was taken. The patient was given ASA III-E and anesthesia was planned. A postoperative intensive care unit was reserved and the patient was taken to the operating room after standard monitoring procedures. Arterial blood pressure monitoring was achieved with radial artery cannulation. An automatic external defibrillator was kept ready. Atropine was also kept ready against the risk of vagal effects.

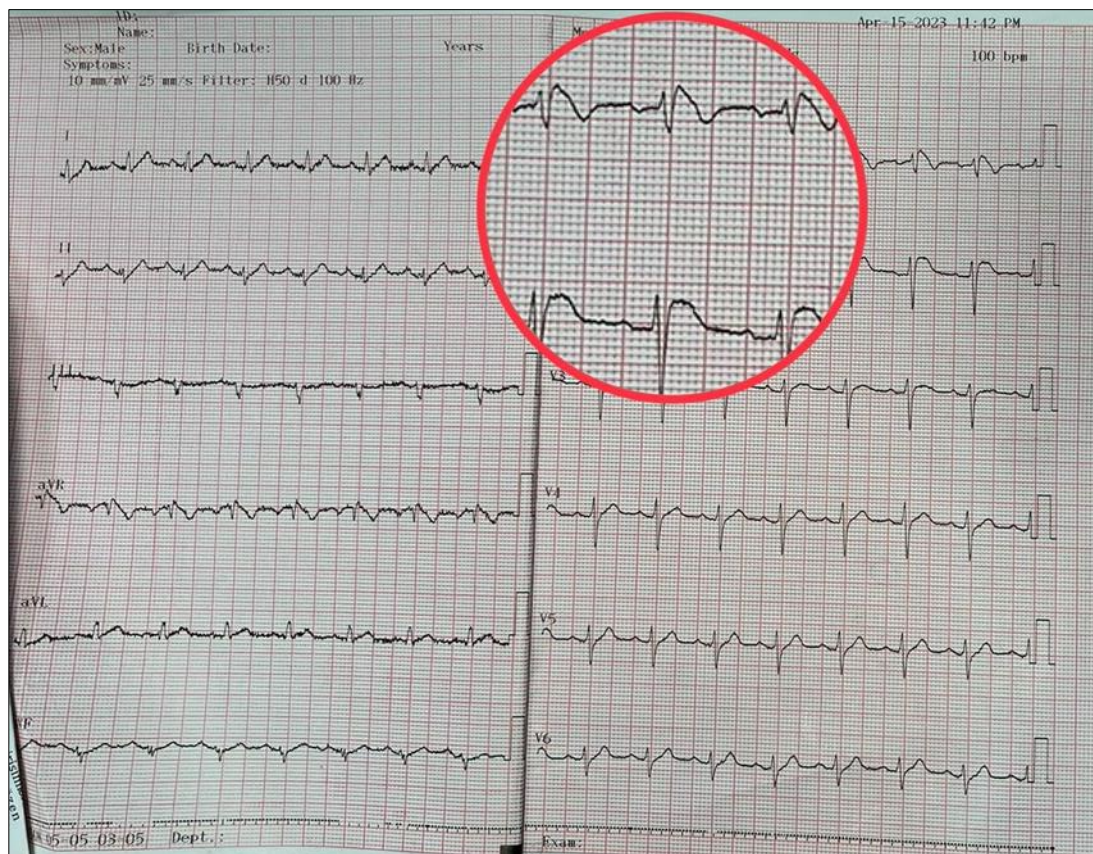


Figure 1 Preoperative ECG, Brugada Type 1 ECG

Anesthesia was induced with propofol 2.5 mg/kg, fentanyl 1 mcg/kg, and neuromuscular blockade provided through 0.6 mg/kg rocuronium bromide. The patient was intubated and anesthesia was maintained with sevoflurane and remifentanyl infusion. Total surgery and anesthesia times were 130 min and hemodynamic status was stable throughout the surgery. The patient was decuritized with 2 mg/kg sugammadex. Postoperative analgesia was provided by tramadol.

The patient was transferred to the intensive care unit. He was discharged on the second postoperative day with the recommendation of a cardiology outpatient clinic check-up, as no problems were encountered.

3. Discussion

In 1992, Brugada syndrome was first defined as a cardiac sodium channelopathy, and ST-segment elevation with right bundle branch block was seen in the right precordial leads (V1-V3) on the ECG. BS is the most common cause of sudden cardiac death in patients without structural heart disease [1]. It is known that the prevalence of BS worldwide is very low, around 5/10000. The mean patient age at diagnosis is usually around 40 to 45 years, and there is a gender predominance (males in 80% of cases). It has been reported that 2/3 of these cases are asymptomatic at the time of diagnosis. Presyncope, syncope, and various arrhythmias are observed in symptomatic cases [4]. Our patient had not been diagnosed before evaluation of preoperative ECG.

According to the current definition of the European Society of Cardiology, the BS ECG pattern consists of two types. Type 1 ECG is characterized by ST-segment elevation of more than 2 mm and a subsequent negative T wave in the right precordial lead (V1, V2), occurring spontaneously or after provocative drug testing. Type 1 ECG is diagnostic. In the type 2 ECG pattern, which is suggestive of BS and requires further examination, if shaped ST elevation (≥ 2 mm at the J point) is observed [5].

It has been noted that parasympathetic tone increases ST elevation and ventricular arrhythmogenicity in BS. Various factors (e.g. vagal tone, body temperature, meals, anti-arrhythmic and other medications, habits, hormonal status) are known to affect the ECG pattern in BS [6]. Our patient may have developed increased vagal tone and BS type 1 ECG pattern due to the infected knee prosthesis and fever.

Brugada Syndrome can be met by clinicians not only at cardiological referral centers but also in emergency departments, elective and emergency surgery.

There is no consensus regarding the application and technique of anesthesia for these patients [4]. General anesthesia, regional anesthesia, and peripheral nerve blocks were applied in these patients and have been reported in the literature. It has been reported that many drugs used in anesthesia routines (propofol, ketamine, bupivacaine, etc.) trigger arrhythmia in BS patients. Although propofol, opioid, benzodiazepine, neuroblockers, volatile anesthetic and sugammadex can be used safely [7].

Additionally, all organs and systems are affected during the perioperative period. Neuroendocrine and hemodynamic changes occur due to both surgery and anesthesia.

Apart from the standard monitoring depending on the patient's comorbidities and clinical status, it is critical to have an external defibrillator ready at hand in the operating room when providing anesthesia for a BS patient. Some authors have suggested the routine use of invasive blood pressure monitoring, as well as multi-lead ECG and ST-segment analysis [8]. In cases of increased vagal tone and bradycardia, it has been suggested to administer atropine and ephedrine [9].

Before our patient had received anesthesia twice uneventfully, however, in the third preoperative evaluation, we detected a BS type 1 ECG change due to infection and fever. The patient was consulted with cardiology. We decided to apply general anesthesia because we could provide better hemodynamic stabilization. Following the literature, anesthesia was induced with propofol, and fentanyl esmerone and maintained with sevoflurane. The patient's hemodynamics remained stable. The patient was decurarized with sugammadex and the anesthesia was terminated without any problems [4,9,10].

4. Conclusion

Brugada Syndrome is rarely encountered in anesthesia practice. In these patients, preoperative monitoring, taking precautions against possible arrhythmias and the selection of anesthetic agents are important for patient safety. We emphasize the importance of detailed preoperative evaluation each time, even in patients with a known anesthesia history.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Brugada P, Brugada J. Right bundle branch block, persistent ST segment elevation and sudden cardiac death: a distinct clinical and electrocardiographic syndrome. A multicenter report. J Am Coll Cardiol. 1992 Nov, 15, 20(6):1391-6.

- [2] Amin AS, Klemens CA, Verkerk AO, Meregalli PG, Asghari-Roodsari A, de Bakker JM, January CT, Wilde AA, Tan HL. Fever-triggered ventricular arrhythmias in Brugada syndrome and type 2 long-QT syndrome. *Neth Heart J*. 2010 Mar, 18(3):165-9.
- [3] Şahin S, Alkan S, Küçük U, Şahinoğlu Ms. The Correlation Between Brugada Syndrome/ Brugada Pattern And Fever. *Dent & Med J - R*. 2023 Jun, 5(2):1-11.
- [4] Cuttone G, Martucci G, Napoli R, Tigano S, Arcadipane A, Pappalardo F, Sanfilippo F. Anesthesiological management of Brugada syndrome patients: A systematic review. *Saudi J Anaesth*. 2023 Jul-Sep, 17(3):394-400.
- [5] Antzelevitch C, Brugada P, Brugada J, Brugada R, Shimizu W, Gussak I, Perez Riera AR. Brugada syndrome: a decade of progress. *Circ Res*. 2002 Dec, 91:1114-1118.
- [6] Choi EK, Park SJ, Baek JY, Seo M. Peripheral nerve block with ropivacaine in Brugada syndrome patient: Anesthetic consideration. *Saudi J Anaesth*. 2023 Jan-Mar, 17(1):91-93.
- [7] Biricik E, Hatipoğlu Z, Küçükbingöz Ç. Sugammadex in a Patient with Brugada Syndrome. *Turk J Anaesthesiol Reanim*. 2016 Apr, 44(2):99-101.
- [8] Tatsumi H, Takagi M, Nakagawa E, Yamashita H, Yoshiyama M. Risk stratification in patients with Brugada syndrome: analysis of daily fluctuations in 12-lead electrocardiogram (ECG) and signal-averaged electrocardiogram (SAECG). *J Cardiovasc Electrophysiol* 2006 Jul, 17:705-11.
- [9] Santambrogio LG, Mencherini S, Fuardo M, Caramella F, Braschi A. The surgical patient with Brugada syndrome: A four-case clinical experience. *Anesth Analg*. 2005 May, 100:1263-6.
- [10] Carey SM, Hocking G. Brugada syndrome--a review of the implications for the anaesthetist. *Anaesth Intensive Care*. 2011 Jul, 39(4):571-7.