

Research Article

A Case of Pulmonary Edema Triggered by Tracheal Extubation in A Patient with Anthracycline-Induced Cardiomyopathy

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Abstract

Anthracyclines are the most commonly used drugs in the treatment of breast cancer. Although their adverse effects, especially life-threatening cardiotoxicity, are well recognized, anthracycline-related cardiac events have been rarely reported in the perioperative setting. Here, we present a case of massive pulmonary edema triggered by tracheal extubation in a patient with anthracycline-induced cardiomyopathy, undergoing mastectomy for breast cancer. This case highlights the potential risk of a cardiac event in anthracycline-treated patients undergoing surgery.

Keywords: Anthracycline; Cardiomyopathy; Cardiotoxicity; Pulmonary edema

1. Introduction

Anthracyclines are the most commonly used anticancer drugs in the treatment of breast cancer [1]. Although their adverse effects, particularly cardiotoxicity, are well known, only few cases of anthracycline-associated cardiac events in the perioperative setting have been described in the available literature [2, 3]. Here, we report case of pulmonary edema triggered by tracheal extubation in a patient with anthracycline-induced cardiomyopathy.

2. Case Report

A 75-year-old woman was scheduled for right mastectomy for breast cancer. She was treated with doxorubicin for 3 months, followed by docetaxel for 2 months, prior to the surgery. Preoperative electrocardiography revealed sinus tachycardia (117 beats/min) with abnormal Q waves in V1–V3. The cardiothoracic ratio observed on the chest radiograph was 51%. Although she had normal left ventricular (LV) function (ejection fraction (EF) 78%) prior to the chemotherapy, preoperative echocardiography revealed diffuse hypokinesis of the LV (EF 45%), suggesting that she had anthracycline-induced cardiomyopathy. The laboratory tests indicated that the patient was anemic (hemoglobin 10.2 g/dL), hypercholesteremic (total cholesterol level 317 mg/dL), and hyperlipidemic (triglyceride level 212 mg/dL). She was otherwise healthy, with no restriction of daily activities. It was concluded that the patient would be able to tolerate general anesthesia with careful monitoring. Anesthesia was induced with propofol, rocuronium, and fentanyl

and maintained with sevoflurane and remifentanyl. Arterial pressure-based cardiac output was monitored. During surgery, the systolic blood pressure was maintained at 90 mmHg by administering phenylephrine (0.4–1.2 mg/h). The cardiac index was approximately 2.2 L/min/m², and the systemic vascular resistance index (SVRI) was in the range of 2000 to 2400 dynes*s/cm⁻⁵/m². At the time of extubation, she developed an elevated blood pressure of 142 mmHg, and the SVRI increased to >3500 dynes*s/cm⁻⁵/m². Immediately after extubation, the SpO₂ decreased from 99% to 87%. After administration of oxygen at 8 L/min using a face mask, the SpO₂ increased to 93%. The SVRI returned to 2500 dynes*s/cm⁻⁵/m² within minutes. Although the patient had no respiratory discomfort, the postoperative chest radiograph revealed massive pulmonary edema (Figure 1a). Intravenous furosemide was administered, and the pulmonary edema had improved by postoperative day 2 (Figure 1b). She was discharged from the hospital on postoperative day 14.

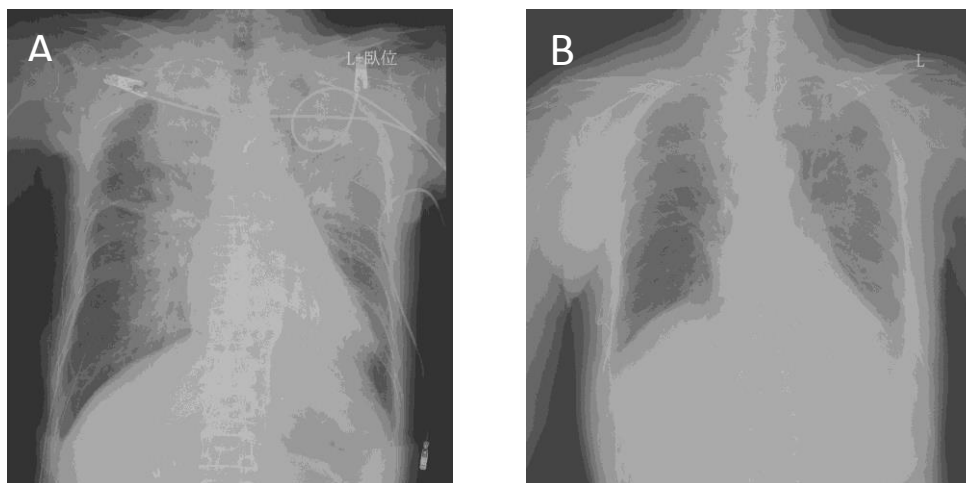


Figure 1: Chest radiographs taken after surgery (A) and on postoperative day 2 (B).

In this case, a mild increase in the afterload led to heart failure, although the cardiac function was not severely depressed. Anthracyclines play an important role in the

treatment of many cancers, including breast cancer. Despite their anticancer efficacy, the clinical use of anthracyclines is limited due to the associated risk of

cardiotoxicity. The severity of cardiotoxicity varies and can range from asymptomatic detectable changes on cardiac imaging to overt clinical symptoms requiring urgent hospital admission. The present patient had asymptomatic cardiotoxicity with mildly depressed LV function. Although the association between anthracycline and perioperative cardiac events has been rarely reported, a previous study suggests that treatment with anthracycline might enhance the cardiodepressive effects of anesthetics, even in patients with normal resting cardiac function [2]. Breast cancer is the most common neoplasm in women, with 2.09 million cases reported worldwide in 2018 [4]. Considering its high prevalence, a substantial number of patients might be at a risk of anthracycline-induced cardiotoxicity. Clinicians should be aware of the cardiotoxic effects of anthracycline, and careful management is necessary when administering general anesthesia to patients with anthracycline-induced cardiomyopathy.

Ethics Approval and Consent to Participate

Ethical approval was not required from our institution.

Consent for Publication

The patient provided written informed consent for the publication of this case report.

Competing Interests

None

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Authors' Contributions

YI was involved with care of the patient and obtained consent from the patient. YI and SI prepared the manuscript. HS and TO supervised writing of the manuscript. All authors read and approved the final manuscript.

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