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Case Report

Asystole During Direct Laryngoscopy Under General Anesthesia: A Case Report

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Keywords

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Abstract

Background: Direct laryngoscopy (DL) may cause hemodynamic changes due to stress response; may cause increased morbidity and mortality in patients.

Methods: A 68-year-old patient was scheduled for cordectomy; 12 minutes after DL onset, sudden asystole and cardiac arrest developed. Cardiopulmonary resuscitation was started, and spontaneous circulation was restored two minutes later. The conscious patient was extubated and taken to the intensive care unit.

Results and Conclusion: Asystole during general anesthesia is a rare and fatal complication. Vagotonic drugssympatholyticis, vagal responses, and neurological causes play a role in the etiology. We aimed to present the management of cardiac arrest under general anesthesia in our case.

INTRODUCTION

Direct laryngoscopy (DL) is a diagnostic and therapeutic method. Although it is a minimally invasive procedure, it may cause hemodynamic changes and increase mortality and morbidity in patients with systemic comorbidities [1]. Prolonged DL and laryngeal surgeries may cause deep bradycardia and asystole by stimulating the N. Vagus [1,2]. Herein, we aimed to present the management of cardiac arrest due to asystole in the intraoperative period in our patient who underwent biopsy with DL and didn't have any comorbidity.

CASE REPORT

A 68-year-old male patient (81 kg, 175 cm) was scheduled for cordectomy surgery with the preliminary diagnosis of a mass in the vocal cord. There weren't any systemic diseases in her preoperative evaluation. Local ethics committee approval and written consent of the patient was obtained. No pathological findings were detected in cardiopulmonary evaluation, chest X-ray, preoperative laboratory tests, and ECG. The patient, who was a smoker, was evaluated as ASA II and mallampati II. After standard monitoring, heart rate was 80/min, and blood pressure was 188/108 mmHg. Lidocaine (1 mg/kg), propofol (2 mg/kg), fentanyl (0.5 mcg/kg) and rocuronium bromide (0.6 mcg/kg) were applied to the pre oxygenated patient for induction. He was intubated with a spiral tube without any problem. Anesthesia was maintained with 50% air + 50% oxygen, 2% sevoflurane mixture and remifentanil infusion (0.02-0.1 mcg/kg/min). Our first measured blood pressure value after DL application after topical anesthesia was 206/140 mm/Hg, after which the dose of remifentanil was increased. While DL continued, suddenly, asystole and arrest developed 12 minutes after induction. The surgical team was warned, the laryngoscopy procedure was terminated, CPR was started, and 1 mg IV adrenaline was administered. Anesthesia was terminated, the patient was ventilated with 100% O_2, and spontaneous circulation was restored two minutes later and antagonized with sugammadex. The patient, who was conscious, cooperative, and oriented, was extubated. He was transferred to the intensive care unit for a detailed diagnosis and follow-up. The patient, who was followed up in the intensive care unit for 24 hours, was discharged from the hospital after it was observed that there wasn't underlying pathology.

DISCUSSION

Cardiac complications are the most common cause of perioperative mortality in noncardiac surgery. The incidence of cardiac arrest during general anesthesia is low, and its mortality is high. Cardiovascular and thromboembolic events, vagotonic anesthetic drugs, anesthesia-induced sympatholysis, vagal responses due to surgical manipulation, and neurological causes play a role in the etiology [1-3]. DL is a standard otolaryngologic surgery method with few minor and major complications. Although hypertension and tachycardia are observed in response to stress to laryngoscopy, arrhythmias up to asystole are rarely encountered. Cardiovascular events such as hypertension affect

the physiological response to anesthesia induction, and stronger responses are often seen in hypertensive [3]. Although our patient had no systemic disease and pathological cardiovascular findings, the first blood pressure measured before induction was 188/108 mmHg. We thought that these high blood pressure values measured in our patient with the development of sudden asystole and cardiac arrest after DL application may have caused asystole by causing an excessive physiological response with DL. During DL, hypoxemia and an increase in parasympathetic tone due to vagal stimulation may cause bradycardia and asystole [1,3]. We thought our case wasn't due to hypoxemia because there wasn't any problem during intubation and desaturation after anesthesia induction. The laryngeal surface of the epiglottis is innervated by the superior laryngeal branch of the N. vagus and bisstimulated directly during DL. It is known that tusingvagotonic agents such as propofol and fentanyl in induction may be effective in this bradycardia and asystole, as well as the sympatholytic effect of remifentanil, which is used in maintenance, on the central nervous system [2,3]. We think that this effect was triggered after induction in our patient. Superficial anesthesia, hypoxemia, stimulation of the afferent visceral parasympathetic fibers of the N. vagus, and carotid sinus distension due to hyperextension may cause arrhythmias, asystole, and cardiac arrest [1-3] (Figure 1). After topical anesthesia, our first measured blood pressure value after DL application was 206/140 mm/Hg, and the dose of remifentanil was increased. Sudden asystole and cardiac arrest developed after 12 minutes while DL was in progress. We applied topical lidocaine, stopping the surgical stimulus, atropine, and CPR to prevent and treat these. Latuska et al. [4], reported that they terminated the surgery in a 63-year-old ASA II patient with a history of hypertension and smoking by removing the surgical stimulus due to the development of deep bradycardia because of intense vagal stimulation during micro laryngoscopy and by intervening with glycopyrrolate for bradycardia [1,3]. In the case of Glassman et al. [2], when bradycardia was observed during cuff puncture during the laryngoscopy procedure, spontaneous circulation was achieved by applying CPR for 5 minutes. They thought that strong vagal response, continued stimulation due to laryngoscopy, vagotonic drugs, and stimulation of the larynx and trachea during tube replacement were the reasons for this event. Taufique et al. [5], presented that a 67-year-old patient without cardiovascular disease developed asystole after laryngoscopy, and spontaneous circulation was achieved in a short time with CPR. In this case, they blamed supplements that contained aconitum. Although there are many cases of bradycardia related to DL in the literature, asystole has been reported to be very rare. In our case, no pathological finding was detected in the preoperative cardiopulmonary evaluation, chest X-ray, laboratory tests, and ECG. We observed that our patient didn't develop intraoperative hypoxemia. In the neurological examination, no acute pathology

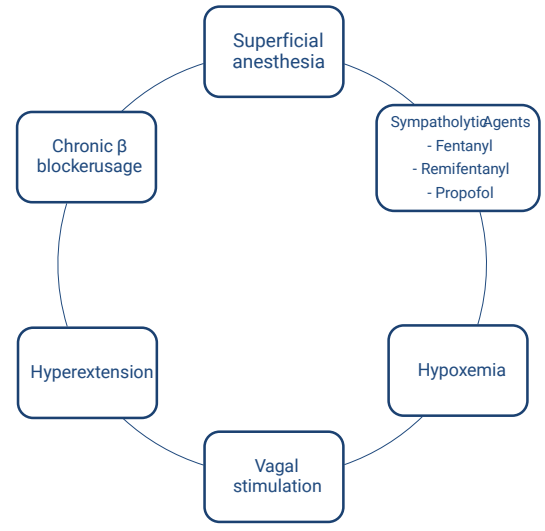

Figure 1 Factors that trigger asystole during DL.

could lead to this event was found in the evaluations made after asystole and arrest. In the light of the literature, we think that asystole and arrest may have developed in our patient due to changes in hypertensive response, activation of N.vagus due to surgical stimulation, and multifactorial causes due to the effect of vagotonic anesthetic drugs. Asystole and cardiac arrest during DL are rare but mortal complications.

CONCLUSION

In managing complications during DL, early awareness with a multidisciplinary team approach, communication with the surgery, and accurate and rapid intervention should be kept in mind.

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