General Anesthesia and Endotracheal Intubation for a Patient with Anomalous Carotid Arteries

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INTRODUCTION

The carotid arteries rarely lie in an anomalous location, in close proximity to the midline just dorsal to the hypopharynx and the larynx [1-6]. We describe a patient with 2 separate carotid anomalies and an aortic arch anomaly who required general anesthesia and oral endotracheal intubation.

CASE

A 38-kg, 4 foot, 11 inches–woman in her nineties with blebitis and endophthalmitis presented for a left eye evisceration. Her past medical history was significant for glaucoma, hypertension, non-insulin-dependent diabetes, and syncopal attacks. Her EKG (SR) showed a 2nd degree heart block (Mobitz type 2), so insertion of a permanent pacemaker was planned after her eye surgery. A CT angiogram revealed contiguous “kissing” carotids at the level of the 2nd and 3rd cervical vertebrae and a tortuous left common carotid artery adjacent to the trachea at the level of the 7th cervical vertebra and hypertensive tortuosity of the aortic arch (Figure 1). In the OR, the initial cuff BP was 193/74, heart rate (HR) was 73, and SaO2 was 98%. Anesthesia was induced with lidocaine (60 mg), propofol (70 mg), and fentanyl (50 mcg). Muscle relaxation was with vecuronium (5 mg). Cricoid pressure was not applied. Direct laryngoscopy was easily performed with a MAC 3 blade and a 7.0 mm endotracheal tube (ETT) was inserted 2 cm at the lips. As the cuff on the ETT was inflated, the patient’s HR dropped suddenly from 65 to 40. Glycopyrrolate (0.2 mg) was immediately administered, and the HR increased to 82 with a BP of 97/65. Sevoflurane was employed as an inhaled anesthetic for the remainder of the case. There were no further arrhythmias, surgery proceeded uneventfully, and the patient made a full recovery from general anesthesia. She had no neurologic sequelae.

DISCUSSION

Anomalous carotid arteries can course just dorsal to the larynx and the midline of the hypopharynx. [1-6]. In this patient a CT angiogram revealed contiguous “kissing” carotids at the C2-C3 with the internal carotid artery approaching the midline, a tortuous left common carotid artery adjacent to the trachea at the C7 level (Figures 1, 2 and 3) and hypertensive tortuosity of the aortic arch (Figures 1 and 4). Given these radiographic findings, the two main concerns in this patient during intubation were; avoiding left common carotid blood flow compromise with the compression of the anomalous left carotid artery in the retropharyngeal space and avoiding reflex bradycardia through stimulation of the baroreceptors in the left carotid body and aortic arch (Figure 8) [7].

Old age, female gender and tortuous ICA are known risk factors for a decreased distance between the ICA and the pharyngeal wall [8]. In this case, cricoid pressure was not applied. The patient did not experience any signs or symptoms indicating cerebral perfusion compromise, but she experienced bradycardia after intubation. The bradycardia occurred immediately after direct laryngoscopy, intubation and inflation of the ETT cuff. We surmise that stimulation of the baroreceptors as the most likely cause of this patient bradycardia. Compression of the retropharyngeal anomalous left carotid bulb close to midline during direct laryngoscopy may have contributed to the patient’s bradycardia [9]. Also, compression of the aortic arch at the level of the distal trachea by the ETT cuff inflation can contribute to bradycardia [8]. The patient’s preexisting cardiac conduction defect may have rendered the patient more vulnerable to bradyarrhythmias especially with the use of vagotonic and sympatholytic drugs like fentanyl and propofol.

CONCLUSION

Providing general anesthesia for patients with anomalous “kissing” carotids may be associated with cerebral hypoperfusion and bradycardia. With the presence of kissing carotids in the retropharyngeal space, direct laryngoscopy, insertion of TEB, probe or over inflation of LMA may contribute to cerebral hypoperfusion and/or bradycardia.

Hypertensive tortuosity of the aortic arch is usually present in hypertensive patients with anomalous “kissing” or tortuous carotids and may contribute to bradycardia with stimulation of aortic arch baroreceptors with inflation of the endotracheal cuff.

REFERENCES