

Airway management of a patient with Forestier's disease

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Abstract

Forestier's disease, also called diffuse idiopathic skeletal hyperostosis (DISH), is a noninflammatory enthesopathy, ossifying the anterolateral spine and sparing the disc and joint space in elderly men, mostly at thoracic levels. Intubation difficulty and spinal cord injury are potential problems when managing the airway in DISH patients. We report a patient with Forestier's disease who was admitted for osteophyte resection. After taking a detailed history, we evaluated the airway carefully. Also, preparation for difficult intubation was done. After a rapid sequence induction, we performed mask ventilation and laryngoscopy without hyperextension of the neck, to prevent spinal cord injury. Although the worldwide standard for management of the airway in DISH patients is awake fiberoptic intubation, we chose conventional laryngoscopy because a fiberoptic bronchoscope was not available.

Key words Forestier's disease · Airway management · Intubation difficulty

Introduction

Forestier's disease, also called diffuse idiopathic skeletal hyperostosis (DISH), is a non-inflammatory enthesopathy ossifying the anterolateral spine and sparing the disc and joint space in elderly men, mostly at thoracic levels [1]. Dysphagia, airway obstruction, and airway edema are common symptoms. Difficult intubation, atlantoaxial subluxation, and aspiration pneumonia are major risks for anesthesia management.

Case report

A 68-year-old man was admitted to the Ear Nose Throat Department of our institution with the complaints of dysphagia, cough, dysphonia, and minimal

dyspnea. There was no history of obstructive sleep apnea, snoring, or daytime sleepiness. However, the dyspnea had worsened in the year before admission. On physical examination, he had minimal dyspnea in the supine position. His cervical motion was restricted. In the sitting and lateral positions, his symptoms were alleviated. His atlanto-occipital motion was in the normal range and no stridor was detected. The patient's Mallampati score was II. His temporomandibular motion and mouth opening were determined to be in the normal ranges. Also, his upper incisors and upper molars were loose. His height was 171 cm, and weight was 61 kg. Indirect laryngoscopy revealed that he had a gross osseal mass, originating from the retrocricoid region and lying to the anterior region of the larynx. The mass partially obstructed the airway passage, which may have caused difficult intubation. Lateral cervical radiogram and cervical tomography revealed osteophytes, which were lying on the anterior surfaces of the second to fifth cervical vertebrae (Figs. 1, 2). The osteophytes were creating a mass effect on the airway in the region of the hyoid bone and cricoid cartilage. The patient also had diabetes mellitus (DM), diagnosed 5 years previously, regulated with oral antidiabetics.

Elective surgery under general anesthesia was planned for resection of the osteophytes. When lying in the supine position, the patient could not place his head horizontally because of neck motion difficulty, so a thick pad was placed under his head. Also, the semisitting position was used for induction. His restricted cervical motion and partially obstructed airway alerted the anesthesia and surgical team that intubation would be difficult. Preoperative preparation for immediate emergency tracheostomy was made. Also, various laryngoscopy blades, intubation tubes, and a laryngeal mask airway (LMA) were ready for use. Because a fiberoptic bronchoscope was not available in the hospital, it was not ready for use. The patient was informed about awake intubation, but he refused this procedure.

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Fig. 1. Lateral cervical radiogram, showing osteophytes lying on the anterior surfaces of the second to fifth vertebrae



Fig. 2. Cervical tomography, showing the mass effect of the osteophytes on the airway in the region of the epiglottis

After the monitoring of ECG, Sp_{O_2} , and noninvasive blood pressure (NIBP), the patient was preoxygenated with 100% O_2 . Anesthesia was induced with 50 μ g fentanyl, 3 mg midazolam, 130 mg propofol, and 80 mg succinylcholine. Naloxone and flumazenil were prepared for the potential development of CVCI (cannot ventilate, cannot intubate). Face mask ventilation was rather difficult because of the patient's neck extension difficulty. On direct laryngoscopy, the Cormack Lehane score was II, with the aid of the backward-upward-rightward pressure (BURP) maneuver. Laryngoscopy revealed that the mass was obstructing the airway passage from the posterior larynx, and only a small-diameter intubation tube was able to be passed. The patient was intubated with a 24-F armored endotracheal tube (internal diameter [ID], 6.0 mm; outside diameter [OD], 8.2 mm; Mallinckrodt, Ireland) in front of the mass. Bilateral auscultation of chest and observation of end-

tidal CO_2 on the monitor confirmed endotracheal intubation. Peak airway pressure was maintained at the normal range (20–25 mmHg) with a tidal volume of 450 ml and frequency of 15 min^{-1} . Anesthesia was maintained with 50% O_2 , 50% N_2O , and sevoflurane (1%–2%). The operation lasted for 200 min. At the end of the operation, the patient was extubated without any problem.

Discussion

DISH is often asymptomatic, and its prevalence is up to 27.3% in males [2]. Because of the relatively high prevalence of the disease, anesthetists need to be aware that patients with DISH have an increased risk of difficult intubation. Risk factors for DISH are: male sex, age over 50 years, obesity, and DM with hyperuricemia and/or hyperlipidemia. The diagnosis is based on radiological findings, new bone formation bridging at least four contiguous vertebral bodies, and the absence of inflammatory changes in facet or sacroiliac joints. Dysphagia is the most frequent symptom, although neurological signs are, rarely, observed. However, spinal hyperostosis can predispose to chronic myelopathic symptoms and acute spinal cord injury by reducing the flexibility of the spine, narrowing the spinal canal, and causing atlantoaxial subluxation of the cervical spine. [2] To prevent traumatic spinal cord injury in our patient, we carried out mask ventilation and laryngoscopy carefully without hyperextension of the neck.

Respiratory compromise is rare in patients with DISH, but airway obstruction, airway edema, and aspiration pneumonia can be seen in DISH patients [3–5]. Usually, the sitting or lateral position alleviates dyspneic symptoms. For this reason, we used the semisitting position to prevent dyspnea during induction. Difficult intubation due to DISH has been reported in the literature [6]; in this report, osteophytes were located in the mid-cervical region and caused an acute angulation of the trachea; only the smallest endotracheal tube could pass through the lesion.

Fiberoptic-assisted awake intubation is the safest choice in DISH patients when difficult intubation is suspected. Palmer and Ball [7] reported a patient with DISH who had a known history of three failed intubations; they reported that the patient was intubated with an intubating LMA with fiberoptic assistance. But, if a fiberoptic bronchoscope is not available, as in our situation, other preparations must be available for difficult airway management. Awake intubation is a suitable choice, but our patient refused this procedure. Although an LMA is a choice for managing the airway in patients with difficult intubation, it may not be the first choice when the obstruction is below the larynx. Direct visualization of the larynx and trachea either by

laryngoscopy or fiberoptic bronchoscopy helps the anesthetist to determine whether or not the tube can be passed through the lesion. We performed direct laryngoscopy because a fiberoptic bronchoscope was not available in our hospital. Induction was performed with the rapid and short-acting anesthetic agents propofol and succinylcholine to obviate a "cannot ventilate cannot intubate" situation. Emergency tracheostomy under mask ventilation would have been performed if the intubation attempts had failed. With direct laryngoscopy, a narrow airway passage was seen, so a small-diameter intubation tube was chosen for intubation. The first attempt at intubation was successful, with little difficulty in tube placement anterior to the mass in the obstructed region.

Conclusion

In the absence of a fiberoptic bronchoscope, we chose conventional intubation with rapid sequence induction in a DISH patient. In such patients, mask ventilation and laryngoscopy must be done carefully, without hy-

perextension of the neck, for the prevention of spinal cord injury.

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