

Possible difficult laryngoscopy caused by masticatory muscle tendon-aponeurosis hyperplasia: we anesthesiologists should be aware of this disease

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Abstract Masticatory muscle tendon-aponeurosis hyperplasia (MMTAH) is a new disease entity characterized by limited mouth opening due to contracture of the masticatory muscles resulting from hyperplasia of tendons and aponeuroses. The other clinical feature is that the face of the patient with this disease displays a square mandible configuration. Muscle relaxants provide no relief for the limited mouth-opening ability. Anesthesiologists need to suspect difficult airway when patients have limited mouth opening with square mandible configuration. MMTAH can therefore be a possible cause of difficult intubation.

Keywords Masticatory muscle tendon-aponeurosis hyperplasia · Square mandible · Difficult airway management

Introduction

As described by Yoda et al., masticatory muscle tendon-aponeurosis hyperplasia (MMTAH) is a new disease entity characterized by limited mouth opening due to contracture of the masticatory muscles as a result of tendon hyperplasia and aponeuroses [1]. The other

clinical feature is that the face of the patient with this disease displays a square mandible configuration [1]. MMTAH is a possible cause of difficult intubation because of the limited mouth-opening ability. We present a case of MMTAH that resulted in difficult laryngoscopy after induction of anesthesia.

Case description

Institutional review board approval and informed consent were exempted because no ethical problem was included in this case report, and the patient cannot be identified from case presentation alone. A 70-year-old woman, American Society of Anesthesiologists (ASA) II, was admitted for aponeurectomy of masticatory muscles because of MMTAH. Preoperative airway assessment, slightly limited mouth opening (30 mm), was recognized; however, other problems were not detected. Because of oral and maxillofacial surgery, left nasal intubation was chosen. General anesthesia was induced with fentanyl 100 µg and propofol 80 mg i.v. No premedication was given. After induction of anesthesia, face-mask ventilation was initiated easily, as we expected. Rocuronium 40 mg was given to facilitate tracheal intubation. However, mouth opening was decreased compared with when awake (20 mm), and keeping her mouth opening was also difficult. We had already obtained information of possible difficult airway form surgeons preoperatively and anticipated the possibility of difficult laryngoscopy. However, we judged that we had time to verify whether laryngoscopy was actually difficult because it was not an emergency situation. In consequence, insertion of a laryngoscope was difficult, which required us to use other airway devices. Finally, TrachlightTM was useful for tracheal intubation.

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Discussion

In patients with MMTAH, both mandibular angles show hyperplasia, resulting in a characteristic square mandible. Square mandible (Fig. 1) represents a facial configuration characterized by a pronounced lower angle of the mandible, giving an appearance of a square face [2, 3]. By contrast, some patients with limited mouth opening due to problems of temporomandibular joint tend to show a bird-face deformity, which is characterized by upper airway obstruction in the form of either severe night snoring or obstructive sleep apnea, inability to open the mouth, and severely convex facial profile [4]. Therefore, it is relatively easy to anticipate difficult airway in patients with a bird-face deformity. However, it may not be as easy to predict difficult laryngoscopy under muscular relaxation from square mandible appearance only, because the thyromental distance is not short in these patients [5], although it has been reported that some patients with square mandible exhibit a limited mouth opening [2]. On the preoperative evaluation, the possibility of difficult airway can be underestimated, even if limited mouth opening is recognized, because it may be expected that muscular relaxation can make mouth opening easy. MMTAH does not include muscular hypertrophy. Therefore, limited mouth opening is not relieved by muscle relaxants [1]. On the contrary, there is a possibility that jaw opening muscular relaxation by muscle relaxants makes keeping the mouth opening more difficult because muscle relaxants do not affect hyperplastic tendons and aponeuroses of the masticatory muscles, which means that tension in those muscles do not change. Put simply, jaw-opening muscles allow patients to keep their mouth open when awake. However, the force necessary to keep the mouth open is removed with muscle relaxants.

In our patient, we obtained preoperative information of possible difficult airway from surgeons because the patient had oral and maxillofacial surgery-releasing MMTAH. Thus, we anticipated the possibility of difficult laryngoscopy and easily moved on to alternative airway management. However, other surgical cases with MMTAH might develop unanticipated difficult airway. We need to suspect difficult airway when patients have limited mouth opening with square mandible configuration.

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Fig. 1 Typical square mandible (not this case, but shown for a better understanding of square mandible. The authors have already obtained permission for publication of this photograph from the patient)

Conflict of interest None.

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