Letter to the Editor

Nasotracheal intubation in an angiosarcoma-related difficult airway: a case presentation

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Introduction

Recent guidelines (1,2) indicate that the procedure for awake nasotracheal intubation (NTI) has rarely been described in detail. We report a rarely encountered difficult airway caused by an angiosarcoma-related lesion, characterized by lateral displacement of the right condyloid process and extensive right sinonasal diffusion after resection of maxillofacial angiosarcoma. Angiosarcomas are rare, endothelial cell-originated soft-tissue sarcomas, and surgery is the main curative treatment option (3). For subsequent surgery requiring general anesthesia, awake NTI is regarded as the safest approach when anticipating a temporomandibular joint (TMJ)-related difficult airway (4). We present a case of successful NTI and intraluminal lung isolation.

Case presentation

In September 2019, a 30-year-old female patient was admitted to the local hospital with a newly found left upper lung tumor. Prior to this hospitalization, the patient had undergone 3 operations at other hospitals, including primary resection of maxillofacial angiosarcoma with subtotal resection of the maxilla and titanium mesh implantation, infection debridement and local flap to repair the tissue defect, and titanium mesh removal with extended resection of recurrent tumor and tracheotomy. She had also undergone nearly 30 cycles of postoperative radiotherapy. Lung metastasis was suspected, and left upper lobectomy through thoracoscopy was planned. However, at the preoperative visit, the anesthesiologist faced the following challenges: limited mouth opening of <2 cm (*Figure 1A*); 3-dimensional (3D) printing of the maxillofacial region showing right zygomatic arch resection and partial maxillary resection (*Figure 1B*); and computed tomography (CT) of the TMJ showing lateral displacement of the right condyloid process (*Figure 1C*), with a reformatted CT image of the paranasal sinus showing extensive sinonasal diffusion of the lesion causing severe stenosis of the right nasal cavity (*Figure 1D*). Chest CT images revealed no sign of tracheal stenosis. After the preoperative evaluation, we decided to perform an awake NTI and placement of an intraluminal bronchial blocker (BB) through the left nasal cavity.

Awake NTI was performed by 2 senior anesthesiologists with the patient in supine position. Peripheral vein and invasive arterial monitoring was established in addition to routine monitoring and oxygen mask administration. Intravenous dexmedetomidine was infused at a loading dose of 1.0 μg/kg (completed 10 minutes later), which was followed by remifentanil at a loading dose of 0.5 μg/kg and then continuous infusion at 0.1 μg/kg/min (5). Within this time period, a 3% ephedrine cotton swab was used to contract the mucosal vessels of the left nasal cavity (6) and was coupled with nasal application of 3% oxybuprocaine hydrochloride gel. After 10 minutes, on confirming the level of sedation (Ramsay sedation score 5: patient asleep,

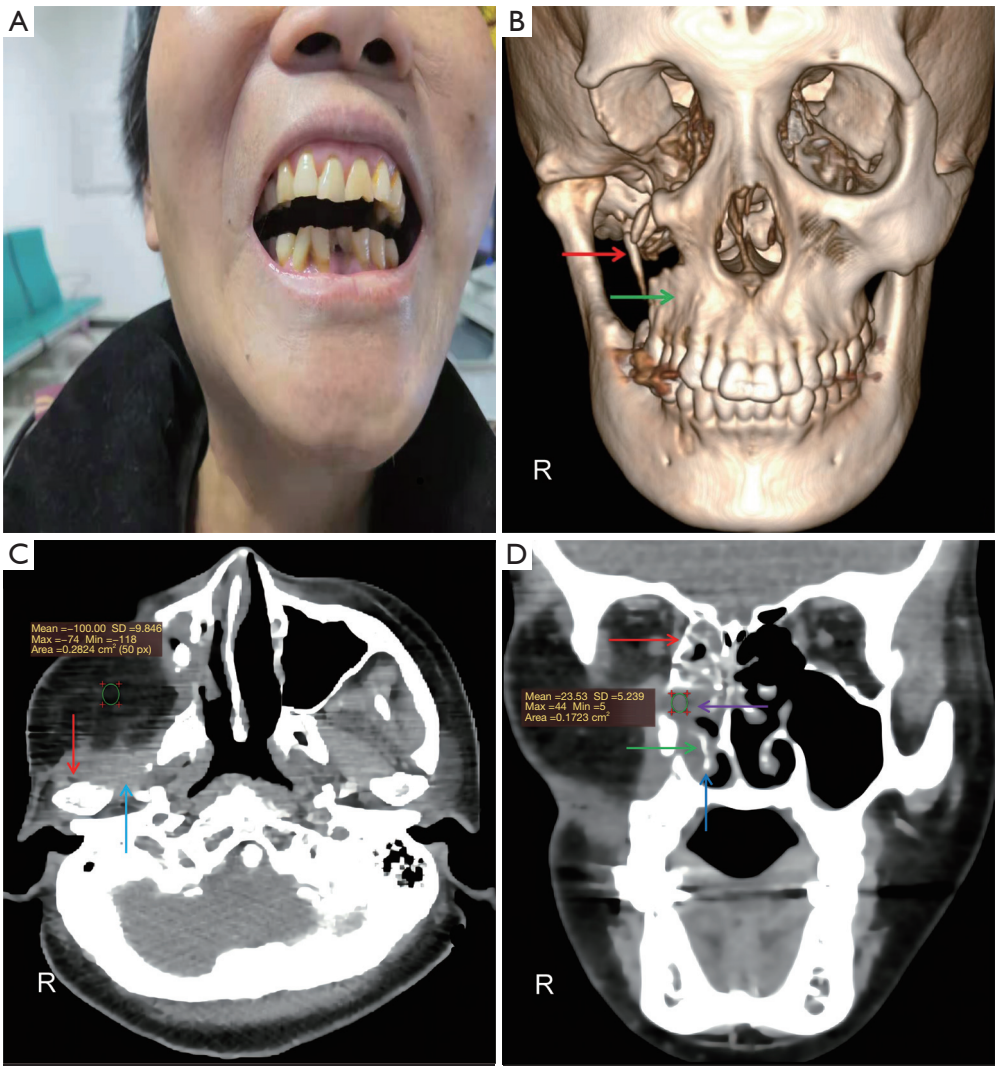

Figure 1 Preoperative findings. (A) Limited mouth opening of the patient with maximum effort. (B) 3D printing of the maxillofacial region showing right zygomatic arch resection (red arrow) and partial maxillary resection (green arrow). (C) CT image showing broadening of the right TMJ space caused by subluxation of the TMJ (red arrow) and lateral displacement of the condyloid process (blue arrow). (D) Reformatted CT image of the paranasal sinus showing soft tissue density shadow of the right ethmoid sinus (red arrow), the middle meatus (purple arrow), and inferior meatus (green arrow), as well as bone destruction and partial disappearance of the right inferior turbinate (blue arrow). 3D, 3-dimensional; CT, computed tomography; TMJ, temporomandibular joint.

sluggish response to light glabellar tap or loud auditory stimulus), a single-lumen endotracheal tube (ET) with an inner diameter of 6.5 mm was inserted over the fiberoptic bronchoscope (FOB; external diameter 5.2 mm; Shenzhen Insighters Medical Technology Co., Ltd., Shenzhen, China), and both were sufficiently lubricated by medical gauze filled with oxybuprocaine gel. The FOB was advanced gently while the patient experienced slight discomfort. When the glottis was reached, an epidural catheter was inserted through the forceps channel of the FOB (7) until the vocal cords came into view, and then 2 mL (20 mg) of lidocaine (2% lidocaine hydrochloride) was sprayed into the glottis with mild cough reflex. The spray was repeated 5 minutes later, and the patient had no cough reflex. The awake NTI was completed smoothly. The end-tidal carbon dioxide tension ranged from 30 to 35 mmHg, and there were no severe reactions such as hypoxia, rhinorrhagia or hypertension; the ET position was confirmed by the FOB.

Combined intravenous and inhalational anesthesia was maintained, and a 7 Fr BB (Wellead Medical Co., Ltd., Guangzhou, China) was inserted through the lumen of the ET with intraluminal use of the FOB (external diameter 2.8 mm, Shenzhen Insighters Medical Technology). The FOB and BB were sufficiently lubricated with oxybuprocaine gel, and satisfactory blockade of the left main bronchus was achieved. Lung isolation was reconfirmed by the FOB after the patient was turned to the lateral position. The subsequent operational procedure was uneventful. The patient had stable hemodynamics and normal arterial blood gas analysis, and the maximum airway pressure did not exceed 25 cmH_2O. Postoperative extubation was carried out in the operating room when the patient was fully awake. The lung lesion was diagnosed as malignant hemangioendothelioma.

All procedures performed in this study were in accordance with the ethical standards of the institution and/or national research committee(s) and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of the journal.

Discussion

In this case of angiosarcoma-related difficult airway, surgical trauma, radiotherapy to the soft tissue, recurrence of angiosarcoma, displacement of the condyloid process, and interincisor distance <2.5 cm (8) all contributed to making transoral tracheal intubation difficult. Additionally, due to severe stenosis of the right nasal cavity, the left nasal cavity had to be used for mechanical ventilation and lung isolation.

In such cases, awake NTI should be performed carefully to maintain stable hemodynamics and oxygenation. The combination of dexmedetomidine and remifentanil has been widely used in awake fiberoptic intubation to provide deep sedation without respiratory depression (5), and, except for routine use of nasal vasoconstrictors (6), use of an epidural catheter (7) provides effective delivery of local anesthetic and simplifies the anesthesiologist's task of intubation. Moreover, the application of oxybuprocaine hydrochloride gel to the nasal cavity is effective as topical anesthesia and can also provide sufficient lubrication to airway instruments, reducing airway resistance and optimizing their passage.

Considering the patient's sex and history of tracheotomy, we focused on the size of both the ET and BB. A single-lumen ET with inner diameter of 7.0 mm could have been used effectively (9), but we chose a smaller size (6.5 mm) to reduce the number of attempts (1). A 7 Fr BB is routinely inserted through a single-lumen ET with an inner diameter of 6.0–7.0 mm, also a 5 Fr BB was prepared. Additionally, preparing for potential failure of awake NTI, we also planned a nasopharyngeal airway for assisted ventilation and tracheotomy device.

In summary, despite the recommendations of the Difficult Airway Society for best clinical practice to improve patient safety, the concept of individualized management should be considered. Difficult airway caused by maxillofacial angiosarcoma surgeries has rarely been reported. Along with appropriate sedation and anesthesia, the correct choice of airway devices (transnasal ET and BB, and use of different sizes of FOB) and auxiliary techniques (vasoconstrictor, epidural catheter, and oxybuprocaine gel) further improved the intubation procedure. Hence, careful consideration of anticipated challenges will contribute to successfully establishing the desired airway.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://qims.amegroups.com/article/view/10.21037/qims-22-469/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institution and/or national research committee(s) and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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