



Tracheal Intubation in A Patient with Breast Cancer Complicated with Maxillofacial Bone Metastasis and Bone Destruction

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Abstract

We report the tracheal intubation of a 51-year-old woman with maxillofacial bone metastasis and bone destruction following surgery for breast cancer. The patient had previously undergone radical surgery for left breast cancer and was currently experiencing complications, including bone destruction and pus discharge in the left maxillofacial region. Due to the inability to eat orally and the failure of multiple nasogastric tube placements, it was decided, after multi-department consultation, to perform a jejunostomy under general anesthesia and place a jejunal nutrition tube. Preoperative head and neck CT showed that most of the mandible was missing, there was bilateral maxillofacial and neck soft tissue swelling, and bilateral nasal stenosis. The preoperative anesthesia evaluation indicated that the patient would likely have difficulties with mask ventilation, nasal intubation, and oral laryngoscopy placement. Since conventional anesthesia methods for airway establishment through the mouth or nose were not feasible, spontaneous breathing was maintained in the awake state, and endotracheal intubation was performed under combined tracheal surface anesthesia with basic sedation and analgesia. The patient cooperated well during the intubation process. After the operation, the endotracheal tube was removed, and the patient was returned to the ward.

Keywords

Difficult Airway, General Anesthesia, Tracheal Intubation

Introduction

A difficult airway refers to the clinical situation where physicians trained in anesthesia encounter difficulties in mask ventilation, laryngoscopy, intubation, supraglottic airway ventilation, extubation, or invasive airway management [1]. The incidence of a difficult airway during general surgery is approximately 5.8% [2]. Airway management is

crucial not only in clinical anesthesia but also in emergency resuscitation and critical care. Successfully establishing artificial airways significantly improves the success rate of treatment. Data statistics indicate that 76% of all deaths occur due to a lack of pre-intubation airway assessment or misjudgment [3].

The complex anatomy of the oral and maxillofacial

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region can lead to difficulties in mouth opening, mask ventilation, and inserting a laryngoscope, or even intubation when combined with certain congenital abnormalities (such as cleft lip and palate) or secondary abnormalities (such as trauma or head and facial radiotherapy). Therefore, establishing an individualized respiratory pathway while ensuring patient safety is crucial for surgical planning and patient survival rates. We report a case of a breast cancer patient with jaw bone metastasis and bone destruction who was unable to eat orally and had multiple failed attempts at placing gastric tubes. It was planned to perform general anesthesia for jejunal stoma creation to improve the patient's nutritional status. With thorough preoperative airway evaluation, topical anesthesia, and basic sedation and analgesia techniques, tracheal intubation was successfully performed.

Case Presentation

The patient is a 51-year-old female, with a height of 158 cm and a weight of 47 kg. She was admitted to the hospital due to "jaw and facial pain with pus discharge for 2 years" after undergoing left breast cancer surgery more than 9 years ago. The patient received regular chemotherapy and radiation therapy after the radical surgery for left breast cancer performed over 9 years



Fig-1: Maxillofacial bone destruction with bone protrusion

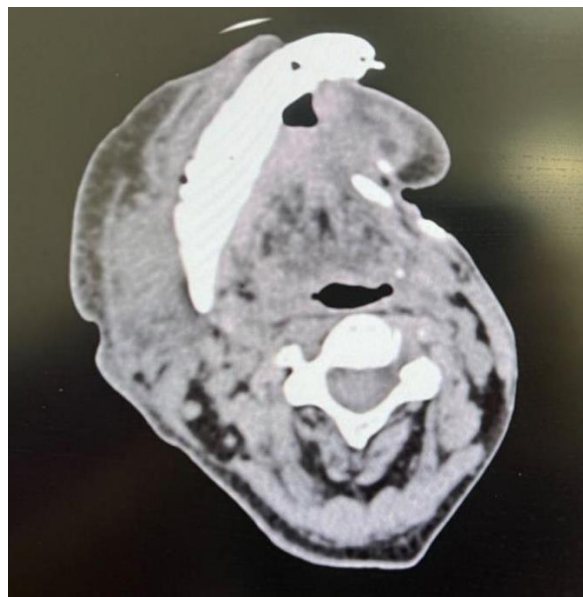


Fig-2: CT showed that the left mandibular Angle was largely missing

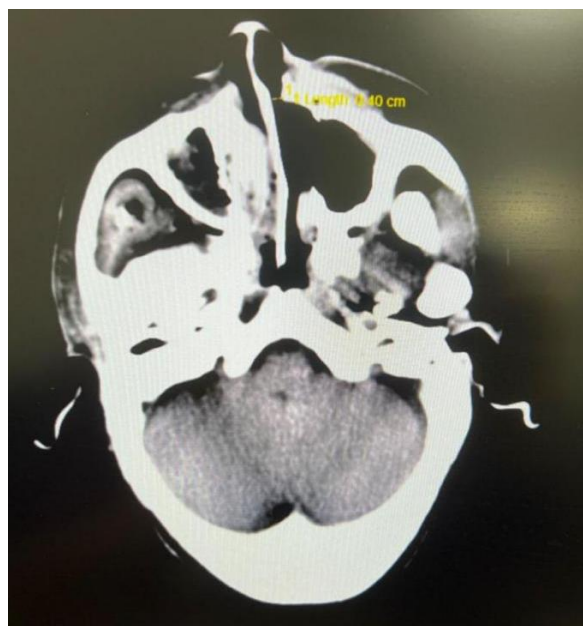


Fig-3: CT showed bilateral nasal stenosis

ago. About 4 years ago, bone metastasis occurred, and she has been on long-term treatment with zoledronic acid. Two years ago, she started experiencing jaw and facial pain accompanied by bone destruction and pus discharge on the left side of her face. During her stay in the oncology department, she was unable to consume food orally, so consultation with the dental department recommended nasogastric tube placement. However, due to changes in her maxillofacial anatomy, multiple attempts at nasogastric tube placement failed. After multidisciplinary consultations within the hospital, it was decided to perform general anesthesia

under scheduled conditions for jejunal diversion and jejunostomy tube placement. Physical examination revealed swelling in the left eye socket, significant limitation in mouth opening, purulent bloody secretions in the oral cavity, and extensive loss of most parts of the lower jawbone protruding outside (**Fig-1**). Preoperative head-neck CT scan showed extensive absence of mandible bone structure; partial absence of upper and lower jaws as well as alveolar ridges on the left side; involvement of the left maxillary sinus interior wall; irregular morphology of adjacent bones; bilateral soft tissue swelling in the maxillofacial region and neck area; hypertrophy of bilateral inferior nasal turbinates leading to nasal stenosis with unclear demarcation from the nasal septum (**Fig-2** and **Fig-3**). Preoperative anesthesia evaluation considered the patient's difficulties in mask ventilation, nasal intubation, and transoral laryngoscope placement, among other factors. The ENT consultation indicated that emergency tracheotomy was feasible if an emergency occurred during airway establishment. Prior to anesthesia, specialist physical examination and film reading showed that the patient could not adopt conventional anesthesia to establish airway through mouth or nose. Therefore, it was decided to retain spontaneous breathing while the patient was awake, and intubation was performed under combined tracheal surface anesthesia and basic sedation and analgesia.

After admission, the patient was placed in a supine position with a high head and neck pad, the upper limb venous passage was opened, and vital signs were monitored. Penethyclidine hydrochloride injection 0.5 mg was administered intravenously, radial artery puncture was catheterized under local anesthesia, oxygen was administered via nasal catheter at a flow rate of 5 L/min, sufentanil 5 µg was injected intravenously, and dexmedetomidine 1 µg/kg/min was administered simultaneously. After the effect of local anesthesia in the oropharynx, the patient was instructed to open her mouth, and a fiberoptic bronchoscope was inserted with 5 ml of 2% lidocaine. After exposing the glottis, a 7# trachea catheter was introduced through the fiberoptic bronchoscope. Sedation, analgesia, and muscle relaxants were added, and ventilation was mechanically controlled. Respiratory sounds were auscultated in both lungs,

and the tracheal catheter was fixed. The patient cooperated well during intubation. After the operation, the patient opened her eyes upon being called, fully resisted the muscle relaxant drugs, and then the tracheal catheter was removed. After her vital signs stabilized, she returned to the ward safely.

Discussion

Airway problems require special attention in the implementation of general anesthesia for patients with maxillofacial bone destruction. Safely and effectively establishing respiratory pathways for surgical treatment is a significant challenge, and adequate preoperative evaluation and formulation of anesthesia programs are crucial. The patient had the following issues: 1) The opening of the patient's mouth was limited to 2 cm, making it difficult to place the laryngoscope; 2) Imaging showed bilateral nasal stenosis and difficulty in nasal intubation; 3) Mandibular destruction with stump protrusion outside the mouth, and pus and blood secretion in the mouth, made intubation difficult and emergency tracheotomy necessary if breathing was interrupted. Therefore, this patient had predictable airway difficulties, including mask ventilation, laryngoscope placement, and nasal intubation.

Current methods for assessing a difficult airway through physical examination before anesthesia include the LEMON method [4], Wilson risk score [5], and SARI score [6]. Other evaluation methods include the upper lip bite test [7], nail and chin height test [6], maximum condylar distance [8], stern-chin distance [9], and neck circumference/mouth opening [10]. Imaging indicators, including airway ultrasound, can also be used to identify difficult airways [11]. For anticipated airway difficulties, guidelines recommend awake endotracheal intubation. If intubation is unsuccessful, the patient can be awakened to prevent a sudden transition of the difficult airway to an emergency airway. Awake intubation should ensure patient safety while making the patient as comfortable as possible. Small doses of sedative and analgesic drugs should be used to avoid excessive sedation.

This patient had systemic bone metastasis of breast cancer complicated by maxillary and facial bone destruction. The use of analgesic and sedative drugs is

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prone to respiratory depression and other complications, resulting in serious consequences. However, reasonable drug compatibility, dosage, and anesthesia methods can enable patients to breathe autonomously, cooperate with the operation, maintain hemodynamic stability, and avoid cerebral hypoperfusion caused by hypotension.

Conclusion

To summarize, for difficult airways caused by maxillofacial bone destruction and restricted mouth opening, establishing respiratory passages should be individualized and should not be limited to one anesthetic drug or method. Adequate preoperative preparation, effective teamwork, and innovative exploration can improve the success rate of difficult airway management and alleviate patient discomfort. In this case, effective local airway anesthesia, dexmedetomidine combined with low-dose sufentanil for sober sedation and analgesia, and endotracheal intubation guided by fiberoptic bronchoscope resulted in a stable process and satisfactory effect, making it an ideal administration scheme for endotracheal intubation.

Conflict of Interest

The author has read and approved the final version of the manuscript. The author has no conflicts of interest to declare.

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