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AIRWAY MANAGEMENT

Airway management dilemma in a patient with carcinoma of the tongue and retrosternal goiter: a case report

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ABSTRACT

Difficulty in intubation can be addressed if the otolaryngologist performs tracheostomy under local anesthesia. However, it becomes a dilemma when the tracheostomy is anticipated to be difficult due to the presence of retrosternal thyroid enlargement and when the procedure is requested to be done under general anesthesia. We performed airway management in a 72-year-old woman with double challenges of carcinoma of the left lateral border of the tongue and retrosternal thyroid enlargement for tracheostomy and gastrostomy under general anesthesia. We avoided oral intubation and anticipated potential obstructing airway, difficulty in ventilation, and potentially difficult tracheostomy, that limited the choice of our plan towards awake nasal intubation under monitored anesthesia care with dexmedetomidine and target-controlled infusion of remifentanil.

Keywords: Carcinoma; Tongue; Thyroid; Intubation; Tracheostomy

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1. INTRODUCTION

Airway management is challenging when double challenges are present, which narrows the management options and leads to acceptance of the potential risks and complications. Here, we present our experience of airway management in an elderly lady with squamous cell carcinoma (SCC) of the left lateral border of the tongue and a co-existing retrosternal thyroid enlargement who was scheduled for potentially difficult tracheostomy. The aim of this case report is to highlight the airway management option when facing these challenges.

2. CASE REPORT

A 72-year-old woman with SCC of the left lateral border of the tongue was scheduled for elective tracheostomy and open gastrostomy. Her past medical history included type 2 diabetes mellitus and hypertension. She had initially presented with ulcer on the left lateral border of the tongue, which had developed over 9 months and was progressively increasing in size. The oral findings revealed a left tongue mass, and computed tomography (CT) scan staging showed a left tongue lesion measuring $5.0 \times 2.7 \times 3.8$ cm with local extension posteriorly to the left side of the tongue base and medially to the midline of the tongue. It was associated with thickened, irregular, and enhancing left oropharyngeal mucosa and a poor fat plane with a left mylohyoid muscle and part of the left submandibular gland, as well as a diffuse goiter with retrosternal extension, without significant tracheal stenosis. She was not offered surgical resection in view of the large tumor size and was instead offered brachytherapy or radiotherapy.

Two days prior to surgery, the patient developed significant bleeding from the lesion, which was terminated with adrenaline packing over the tongue and required two packed cell blood transfusions. During the airway examination, the mouth opening was good, with the large tongue occupying most of the edentulous oral cavity, giving a class IV Mallampati view. The tongue deviated to the right due to an irregular left-sided lesion (Figure 1). The thyromental distance was normal, and the neck extension was adequate. The trachea was central, with the presence of a soft anterior neck mass measuring 5×3 cm on the right side and 4×4 cm on the left side, without palpable lower borders. There was no stridor. Flexible nasopharyngoscopy by the otolaryngology (ORL) team showed that the base of the tongue was pushed posteriorly, with a pooling of secretions at the oropharynx. Other systemic examinations were otherwise unremarkable. A preoperative thyroid function test showed hyperthyroidism (free T4 30 pmol/L; TSH 0.02 mIU/L), but other investigations yielded results that were within normal limits.

Anticipating difficult airway, we planned awake tracheal intubation (ATI) with a videoscope through the nasal route. Preoperative counseling was provided, with written and verbal consent for high-risk anesthesia due to difficult airway obtained from the patient and her relatives. Upon the patient's arrival in the operating theater. standard monitoring was applied. Preoxygenation was initially delivered with 3 L/min oxygen via nasal prong oxygen in view of the difficulty in applying a tight seal face mask due to the patient's protruding tongue. The patient was given intravenous (IV) infusions of dexmedetomidine and target-controlled infusion (TCI) of remifentanil, with a loading dose of IV dexmedetomidine 1 µg/kg delivered over 10 min. Dexmedetomidine was subsequently titrated between 0.2 and 0.5 mg/kg/h, and TCI remifentanil was started at a target effect concentration of 0.25 ng/mL. Both nasal cavities were packed with ribbon gauze soaked with 4% cocaine solution to anesthetize the nasal passages. The patient was then preoxygenated, and IV glycopyrrolate 200 µg was given as an anti-sialagogue premedication.

Subsequently, a flexible videoscope was inserted through the left nasal cavity, and the airway was further anesthetized using the "spray as you go" technique. After optimal views of the desired structures to be anesthetized were obtained, 3 mL of 2% lignocaine was sprayed through the working channel of the videoscope. Finally, the videoscope was advanced past the vocal cords, and another 3 mL of lignocaine 2% was sprayed onto the tracheal mucosa. Throughout the procedure, an assistant applied a gentle jaw thrust maneuver to maintain airway patency and provide better exposure of the glottis. Oxygenation was maintained, with the patient spontaneously breathing 100% oxygen at 6 L/min through an endoscopic face mask, which was directed close to the oral airway without compressing for a tight seal.



Figure 1: Patient showing cancer of her tongue.

Once adequate airway topicalization was achieved, we used the "tube first" technique by gently inserting a 6.5 mm cuffed armored flexometallic endotracheal tube (ETT) into the left nasal passage before the videoscope was reintroduced via the ETT into the trachea. The ETT was subsequently railroaded into the trachea by sliding over the bronchoscope, and was anchored at 24 cm at the nasal bridge, with correct placement confirmed by direct visualization of the tip of the endotracheal tube to be 2 cm above the carina. The intubation process was smooth, with the patient not showing a coughing reflex. She was then induced with IV propofol 60 mg and rocuronium 40 mg and was ventilated on 2 L/min fresh gas flow with 50% oxygen in air and 2.5% sevoflurane for maintenance.

Tracheostomy was performed by the ORL team. Due to the goiter, an incision had to be made between the superior part of the isthmus and the pyramidal lobe to identify the cricoid cartilage and trachea. No other difficulties were encountered. A 7.5 mm cuffed tracheal tube was inserted and used for ventilation, after which the nasal ETT was removed. The surgical team then proceeded with open gastrostomy and feeding tube insertion, and upon completion of both procedures, the team performed neuromuscular reversal of IV neostigmine 2.5 mg with glycopyrrolate 200 μ g. When the patient was already alert and demonstrated good spontaneous respiration, she was placed on a fixed venturi tracheostomy mask delivering 40% oxygen at 6 L/min. She was then discharged back to the ward after an uneventful observation period during the recovery.

3.DISCUSSION

Ca tongue is one of the potential factors for difficult airway, which requires a proper airway management plan. The presence of friable cancerous tissue that can be easily bled is one of the challenges during intubation. There have been few reported cases of difficult airway with CA tongue in which different approaches to airway management were used.^{1,2}

Our patient was incidentally diagnosed by a CT scan to have retrosternal goiter, which presented additional challenges to us and to the ORL team. The initial plan was to ask the ORL team to perform the tracheostomy under local anesthesia (LA) with monitored anesthesia care (MAC), but in view of potentially difficult tracheostomy, the team requested general anesthesia, which gave us no other options, and to proceed with ATI through the nasal route. The plan under LA and MAC was to be placed on standby if ATI failed.

The Difficult Airway Society (DAS) describes four key components of ATI: sedation, topicalization, oxygenation, and performance.³ We decided to use dexmedetomidine and remifentanil for sedation. Dexmedetomidine is a widely favored sedative for ATI due to its numerous favorable properties, including anxiolysis, analgesia, and minimal respiratory depression. Remifentanil is useful as a supplement to airway topicalization in improving intubating conditions.

Effective airway topicalization is essential in ensuring the success of ATI. Co-phenylcaine (lignocaine 5% / phenylephrine 0.5%) is the recommended agent of choice for airway topicalization, but it is unavailable in our setting. Hence, lignocaine 2% was used instead. Various options exist for topicalization techniques, including nebulization, mucosal atomization via a mucosal atomization device, spray-as-you-go, and transtracheal injection, but there is insufficient evidence demonstrating the superiority of any individual technique.^{4,5} In addition, topicalization of the nasal passage with cocaine 4% provided additional benefits of vasoconstriction, which reduced the incidence of epistaxis.

Supplemental oxygenation is recommended during ATI to reduce the risk of desaturation, especially if the patient is receiving sedation. Although high-flow nasal oxygen 30–70 L/min is recommended by DAS, our selection of the nasal route for ATI meant that only one nasal passage was available for oxygenation. Instead, we opted for the use of an endoscopy mask delivering 6 L/min of oxygen, with the patient free to breathe spontaneously through either nasal oral passage.⁶

Ergonomics and procedural setup play a big role in ensuring the performance and safety of ATI, with two common setups being a sitting patient with the operator facing the patient and a supine patient with the operator positioned behind the patient.^{6,7} We elected the second option, which allowed an assistant to apply jaw thrust maneuver. The selection of ETT is also essential for successful ATI, where the standard polyvinyl chloride ETT has been shown to encounter difficulty during railroading due to laryngeal impingement by its angled tip.⁸ We chose a flexometallic tube because it has more rounded tip, which ensured smooth railroading over the videoscope.

4. CONCLUSION

SCC of the tongue and retrosternal goiter pose unique challenges and, when presented together, create a genuine difficult airway situation. ATI using a videoscope through the nasal passage is the best approach, and tracheostomy under LA with MAC can be considered the second option.

5. Conflicts of interest

There are no conflicts of interest.

6. Authors' contributions

WMNWH, CYAL: Conceptualization

WMNWH, CYAL, NHM, AAA: Data collection

WMNWH, CYAL: Data analysis

All of the authors approved this manuscript for submission.

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