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Case Report

Successful Awake Nasal Intubation for Difficult Airway Management in a Postpartum Woman Who Presented with Left Mandibular Soft Tissue Sarcoma: A Case Report

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Abstract

Background: Soft tissue sarcomas (STSs) are rare malignancies. This type of tumor can cause airway obstruction, anatomical distortion, voice changes, and limitations in opening the mouth, which may complicate intubation or ventilation. Difficult airway management in oral and maxillofacial surgery focuses on maintaining airway reflexes and spontaneous breathing. This case report describes a novel approach to awake nasal intubation in a postpartum woman with left mandibular soft tissue sarcoma. Unlike previous studies that relied on ultrasound or bronchoscopic guidance for awake intubation, this report describes successful blind awake intubation using a transtracheal block. Case presentation: This is a 20-year-old gravida I, para I woman who presented with swelling on the left side of her face for five months. She presented with these symptoms 3 weeks after spontaneous vaginal delivery. The swelling started on the buccal mucosa as a small lesion prior to delivery. After the airway was anesthetized with 5 ml of 2% lidocaine gargle and 5 ml of 2% lidocaine injected through the cricothyroid membrane, awake, blind nasal intubation was successfully conducted. Conclusion: Effective management of difficult airways requires a well-planned strategy, multidisciplinary team discussion, and preoperative assessment. This case report contributes to the literature by demonstrating successful awake blind nasal intubation facilitated by a transtracheal block using 5 ml of 2% lidocaine administered at the cricothyroid membrane. In situations with limited resources, awake blind nasal intubation with a transtracheal block can be a valuable and practical technique for managing difficult intubations. However, it requires a trained and experienced anesthetist.

Keywords

Awake Intubation, Difficult Airway, Nasal Intubation, Postpartum, Soft Tissue Sarcoma, Transtracheal Block

1. Introduction

Sarcomas are a diverse group of mesenchymal cancers with marked histologic diversity. These genes are typically associated with copy number variations, low mutational burdens, and recurrent alterations in limited numbers of genes, including TP53, ATRX, and RBI. Adult soft tissue sarcomas account for approximately 1% of adult solid tumors [1]. Efforts to enhance diagnostic accuracy and treatment outcomes have led to the establishment of specialized programs for managing primary bone tumors and soft tissue sarcomas. The Improving Outcomes Guidance (IOG) issued by the National Institute for

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Health and Care Excellence (NICE) provides widely accepted recommendations for the management of sarcoma patients [2].

Soft tissue sarcomas involving the perioral region occupy a large surface area and pose a significant risk for difficult airway management. These tumors can cause airway obstruction, anatomical distortion, voice changes, and limitation in opening the mouth, making both intubation and ventilation challenging [3]. In oral and maxillofacial surgery, a difficult airway represents a major clinical challenge. Such complications may result from tumors occupying a large surface area, causing airway obstruction and rapid progression to apnea. Additionally, anatomical distortion and restricted mouth opening can make laryngoscope insertion and endotracheal intubation difficult [4]. Therefore, the management of difficult airways in these patients requires a thorough multidisciplinary approach, preoperative airway assessment, and preparation [5].

Difficult airway management in oral and maxillofacial surgery focuses on maintaining airway reflexes and spontaneous breathing. Awake intubation is often employed to prevent a cannot ventilate, cannot intubate scenario [6]. Despite its limited practices, awake intubation is an essential skill in difficult airways. Successful awake intubation may have been performed if the patient was free of anxiety and pain. To achieve this goal, airway reflexes must be attenuated, and pain must be effectively controlled, which can be accomplished via topical anesthesia or nerve blocks [7].

By reducing the intubation time, improving the intubation conditions, and reducing overall complications, airway nerve blocks offer superior anesthesia quality for advanced airway management [8]. A transtracheal block is an anesthetized sensory nerve from the larynx and tracheal mucosa. Coughing induced by endotracheal tubes helps disperse local anesthetic, effectively blocking sensory input from the laryngeal and tracheal mucosa [9]. The transtracheal block technique may be an effective method for awake nasal intubation in resource-limited settings, helping to improve the management of difficult airways. Additionally, it reduces the intubation time, maintains hemodynamic stability, and enhances patient comfort. Here, we report successful awake nasal intubation using a transtracheal block combined with a glossopharyngeal nerve block for difficult airway management in a postpartum woman presented with soft tissue sarcoma.

2. Case presentation

This is a 20-year-old gravida 1, para 1 woman who presented with a 5-month history of swelling on the left side of her face following a spontaneous vaginal delivery 3 weeks prior. The swelling initially arose from the buccal mucosa, gradually enlarged to approximately 10×15 cm, extended to the mandibular angle, and involved the earlobe (Figure 1). Her antenatal and delivery history was unremarkable. She delivered a healthy female weighing 2.9 kg at 37 weeks and 2 days of gestation.

The patient denied any associated pain, local warmth, or bleeding from the mass, although she reported central ulceration. During one period, she was evaluated and took unknown medication at a nearby hospital. After the mass increased and involved the intraoral cavity, she came to this hospital for evaluation and was scheduled for a biopsy. In addition to complaints related to the swelling, she had no history of cough, shortness of breath, palpitation, orthopnea, abnormal body movement, fever, headache, or blurring of vision. She had no personal or family history of chronic illnesses such as asthma, diabetes mellitus, or hypertension, and no history of smoking or alcohol use. On physical examination, her vital signs were within normal limits (blood pressure 100/60 mm Hg, pulse rate 80 beats/min, respiratory rate 20 breaths/min, and temperature 36.4°C). Respiratory examination revealed normal bilateral air entry without added sounds. Cardiovascular examination was unremarkable, with no murmur or gallop. Airway assessment revealed that the mallapati grade is difficult to assess adequately since the cross-sectional area of the mouth is occupied by a mass, but there is no limitation on neck mobility. An intraoral examination revealed a large, ulcerative, and fungating mass involving the entire left buccal mucosa. The lesion appeared firm and inconsistent with fragile tissue with no active bleeding upon manipulation and no gingival attachment (Figure 1).

Figure 1. *Size of soft tissue sarcoma extends upto ear lobe.*

Figure 2. *Ulcerative and Fugitive tumor occupied cross sectional area of mouth.*

Laboratory and imaging findings

Laboratory investigations revealed that white blood cells were 9.3×103 mm^3, hemoglobin (Hgb) was 11.43 g/dl, and haematocrit (Hct) was 36.6%. Renal function tests were within the normal range with a creatinine level of 0.42 mg/dl and a blood urea nitrogen level of 19.12 mg/dl (Table 1).

Table 1. *Investigation result.*

Investigation type	Value	Normal range	Investigation (RFT and LFT type	Reference range	Investigation LFT
WBC	9.3 mm^3	4-11	Creatinine	0.42	0.5-0.9mg/dl
Lym#	1.9 mm^3	1-6	Blood urea nitrogen	19.12	15-50mg/dl
MID#	1.3 mm^3	0.1-2.5	AST	24.01	0-40u/l
Gran#	6.1mm^3	2-10	ALT	18.96	0-40u/l
Gran%	64.3%	50-60	ALP	104.48	65-270u/l
MID%	14.5%	1-10	Bilirubin direct	0.08	0-0.3mg/dl
Lym%	21.1%	20-40	Bilirubin total	0.52	0-0.12mg/dl
RBC	3.67×106 mm^3	3.5-5.5	Total protein	8.07	6.6-8.7mg/dl
Hgb	11.4g/dl	11.5-18	Albumin	3.85	3.5-5g/dl
Hct	36.6%	34-55	PTT	26.2	23.4-40sec
MCV	99.9fl	80-100	PT	13.7	10-15 sec
MCH	31pg	23-40			
MCHC	31.1g/dl	25.5-50			

The chest findings revealed no abnormalities.

Contrast-enhanced computed tomography (CT) of the neck revealed an aggressive, destructive mass involving the entire left mandibular bone. The lesion exhibited a large soft tissue component with features including a solid periosteal reaction and osteoid matrix formation. The associated soft tissue mass contained both necrotic non-enhancing areas and partially enhancing solid components. It extends into the masticular space, with exophytic compression of the buccal space and entophytic growth into the oral cavity. Additionally, there was evidence of erosion of the left lateral pterygoid plate of the sphenoid bone.

Conclusion: These imaging findings are suggestive of locally advanced soft tissue sarcoma.

Informed consent was obtained one day prior to surgery. On the day of surgery in the corridor, the patient changed her clothes, and the IV line was checked. The patient was transferred to the operating room at 8: 00 a.m. Upon arrival, standard monitoring—including non-invasive blood pressure, pulse oximetry, and electrocardiography was applied. Baseline vital signs were recorded as follows: BP 119/65 mmHg, pulse rate 121 beats per minute, and oxygen saturation 99%. All the general anesthesia equipment and medications were prepared in advance. These include adrenaline 1:200,000 mixed with 2% lidocaine for nasal packing, K-Y jelly as lubricant, different sizes of endotracheal tubes, different sizes of laryngoscopes, different sizes of supraglottic airway devices, and a cricothyrotomy set. The premedication administered was 8 mg of dexamethasone and 4 mg of morphine intravenously.

For topicalization, the patient was instructed to gargle 5 ml of 2% lidocaine, targeting the posterior pharynx while avoiding swallowing. The patient was in a seated position during this time and tilted her head slightly backward. The gargling is repeated two times. She then spits out the lidocaine after one minute. The effectiveness of topical anesthesia was assessed via cotton-tipped swabs.

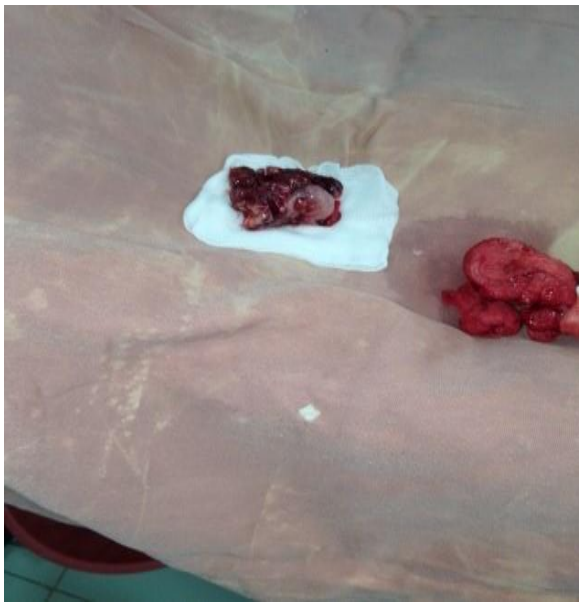

Figure 3. *Sample taken / tissue removed from tumor site in mouth.*

The patient was subsequently placed in a supine position, and the area of the anterior neck was subsequently cleaned three times with iodine (10%) and alcohol. A landmark was identified between the thyroid cartilage superiorly and the cricoid cartilage inferiorly. The cricothyroid membrane was located by palpating the thyroid cartilage (Adam's apple) and moving inferiorly to the palpable groove. After the groove (cricothyroid membrane) was palpated, a 20-gauge needle with the bevel facing downward was inserted 90° to the skin through the cricothyroid membrane. After confirming tracheal placement by aspiration of air, 5 ml of 2% lidocaine was injected. The patient exhibited an immediate cough reflex, indicating adequate distribution of local anesthesia. Any sign of local anesthesia toxicity was monitored. After the suppression of the gag and cough reflex was checked, the patient was intubated with a 5.00 mm internal diameter cuffed reinforced endotracheal tube. The following steps were planned to maintain difficult airway management in cases of failed awake nasal intubation.

1) Immediate cessation of intubation and maintenance of oxygenation.
2) Alternative airway management involving the use of blind bougieassisted oral intubation,
3) Using a supraglottic airway,
4) Awaking the patient,
5) Emergency airway management, such as emergency tracheostomy or cricothyrotomy.

Auscultation was used to check bilateral air entry before induction. Subsequently, 140 mg of propofol, 4 mg of morphine, and 4 mg of vecuronium were administered. Vecuronium (2 mg) and 1% isoflurane were used for maintenance. A biopsy was taken from the ulcerative and friable tissue (Figure 3).

Intraoperative diclofenac (75 mg) IM was administered intraoperatively for analgesic purposes. The patient's hemodynamic parameters remained relatively stable, with a maximum-recorded blood pressure of 150 mm Hg for systolic blood pressure and 70 mm Hg for diastolic blood pressure, and the minimum-recorded blood pressure was 100 mm Hg for systolic blood pressure and 56 mm Hg for diastolic blood pressure (Table 2).

Table 2. *Intraoperative vital sign.*

Vital sign	Time (A.M)								
	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40
BP	119/56	119/68	100/56	120/59	138/70	150/70	132/70	139/65	129/68
PR	110	110	80	70	65	90	89	70	87
SPO2	100	100	100	99	100	99	99	100	99
Ecg	SR	SR	SR	SR	SR	SR	SR	SR	SR

BP-blood pressure, PR-pulse rate, ECG-echocardiography

The total intraoperative fluid was 1000 ml of normal saline (0.9% N/S), and the urine output was 400 ml. There was less than 70 ml/kg of expected blood loss during the procedure. After the procedure was finished, the isoflurane was closed, and reversal of neuromuscular blockage was achieved with 2.5 mg of neostigmine and 1 mg of atropine. There was successful extubation, and no complications occurred. The patient was subsequently transferred to the post-anesthesia care unit (PACU). On arrival at the PACU, vital signs were as follows: BP=80/56, SPO2=93%, and PR=89 beats/min at the time of recording. The total time taken was 1 hour and 90 minutes for surgery and anesthesia, respectively. The patient was stable and discharged on the fourth day. The histological findings confirm soft tissue sarcoma.

3. Discussion

Anesthesiologists frequently face difficult airway management in oral and maxillofacial surgery. This is often attributed to anatomical and pathological factors such as short mandibular length, short thyromental distance, high-grade Mallampati, and mandibulofacial abnormalities [6].

A 2022 Chinese study on angiosarcoma lesions, a type of soft tissue sarcoma, demonstrated that the right condylar process has a bulk that displaces the nearby structure and diffuses widely into the sino-nasal cavity, thereby increasing airway difficulty. This study concluded that awake nasal intubation is one of the safest and most effective approaches for challenging airway management [10].

Similarly, studies published in the Annals of African Surgery by Caroline Mwang et al., Koach et al., and Kabetu et al.

reported successful airway management of a patient with mandibular osteosarcoma via intubation following topical anesthesia of the nasopharynx and vocal cords with 2% lidocaine. In this technique, lignocaine is administered through an endotracheal tube during inspiration [11]. Daniel de Carl also described awake nasal intubation performed via 10% lidocaine spray to the hypopharynx, combined with a bilateral superior laryngeal nerve block using 2 ml of 2% lidocaine via the superior horn of the thyroid cartilage in patients who underwent hemi-mandibulectomy [12].

Furthermore, a 2015 study by Etamaid SH et al. demonstrated successful management of difficult airways in an osteosarcoma patient via awake fibreoptic nasal intubation in the sitting position. Airway anesthesia was achieved via transtracheal block using an (18 G) catheter inserted between the second and third tracheal cartilages. After the catheter was pushed in the direction of the vocal cords and the tip was removed, 4 milliliter's of 4% lidocaine were injected [13].

If an airway is not preserved, life-threatening complications can occur. Advances in visualizing techniques have helped to overcome these conditions. Many times, intubation problems are avoidable and controllable. Since poor airway management has been recognized as a serious issue, performing a comprehensive airway examination before administering anesthetics is crucial [14].

In our patient, a large tumor occupying the oral cavity significantly reduced the cross-sectional area, which resulted in difficult access to the airway through direct intubation. After standard monitoring was performed, the patient was premedicated with 4 mg of morphine and 8 mg of dexamethasone. Awake blind nasal intubation was performed after adequate airway anesthesia was achieved using a transtracheal block with 5 ml of 2% lidocaine under aseptic conditions with iodine (10%) and alcohol. The block was performed after the patient was positioned in the supine position, and the confirmation of the block was confirmed by eliciting the cough reflex. The strength of this case report is that blind awake nasal intubation combined with a transtracheal approach with glossopharyngeal nerve block can be an effective and practical technique for difficult airway management in resource-limited areas. There are several limitations of this case report: 1. The lack of fibreoptic or bronchoscopic devices for intubations and ultrasound guidance for the block. 2. Ineffectiveness for emergency surgery may be due to the ability of esophageal intubation to mitigate the risk of aspiration and hypoxia. 3. It is highly dependent on experience and is not universal for all anaesthetists. 4. Anatomical distortion, tube dislodgment and airway trauma may occur.

4. Conclusion

Tumors of the head and neck present challenges for airway management in anesthesia practice. A multidisciplinary approach is necessary for optimizing patient outcomes. Accordingly, a management strategy, team discussions, and a thorough assessment of the preoperative patient status are needed to address the issue of challenging intubation. A video laryngoscope, fibre optic intubation, bougie, stylet, comb tube, and various sizes of laryngoscope and endotracheal tube should be readily available. In our case, all necessary preparations were made, and awake intubation was planned. Blind awake nasal intubation was successfully performed following adequate airway anesthesia. This was achieved via a landmark-based transtracheal block, with 5 ml of 2% lidocaine combined with a glossopharyngeal nerve block, with 5 ml of 2% lidocaine administered by gargling. Therefore, landmark-based transtracheal and glossopharyngeal blocks are valuable and practical techniques for facilitating awake nasal intubation in patients with difficult airways, especially in resource-limited areas.

Abbreviations

ALT	Alanine Aminotransferase
AST	Aspartate Aminotransferase
ATR	Alpha- Thalassemia Retardation X-linked
BP	Blood Pressure
NICE	National Institute of Health and Clinical Excellence
PACU	Post Anesthesia Care Unit
RR	Respiratory Rate
STS	Soft Tissue Sarcoma
TP	Protein Tumor

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Author Contributions

Tesfaye Asefa: Conceptualization, Data curation, Formal Analysis, Methodology, Software, Writing – original draft

Minda Abebe: Funding acquisition, Project administration, Resource, Writing – review & editing

Yusuf Ahmed: Data curation, Validation, Investigation

Ebrahim Ahmed: Methodology, Resource, Writing – review & editing

Data Availability Statement

Data are shared and available through the corresponding author.

Conflicts of Interest

The author declares that no conflict of interest.

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