

CASE REPORT

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Successful airway management of twin coincidental supraglottic and thyroid masses with difficult fiber optic intubation: a case report

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Abstract

Background: Aberrant airway anatomy in cases of laryngeal carcinomas makes airway management a herculean task for the anesthesiologist. What can further compound the situation is an external compression by thyroid mass.

Case presentation: We present a case report of successful airway management by awake nasal fiberoptic intubation in a 65-year-old male who was found to have compressive symptoms due to thyroid swelling in addition to supraglottic obstructive mass. Although a detailed airway examination and indirect laryngoscope did assist in planning the procedure, but what lay inside could only be dealt with by having an in-depth orientation of airway anatomy, practical know-how to fiberoptic scope, and swift reflexes to prevent an adverse event.

Conclusion: From our experience, fiberoptic intubation can only be optimally utilized if emphasis is laid on planning and preparation for the procedure which are key elements in making any difficult airway management successful.

Keywords: Fiberoptic intubation, Airway management, Intubation, Anesthesiologist

Background

Growths involving the floor of the mouth and larynx pose great difficulty in airway management with respect to both mask ventilation and intubation owing to extensively distorted airway anatomy. Co-existing thyroid gland swelling in a patient with primary laryngeal carcinoma is not uncommon with metastasis reported in 1–30% of the cases (Yuen et al., 1995; Ceylon et al., 2004; Kim et al., 2008). A scenario where both laryngopharyngeal mass and thyroid swelling are co-existing needs careful deliberation on feasible options for securing the airway and ventilation keeping in mind the intraoral and neck invasion. We present a case of successful airway management of a patient with supraglottic carcinoma

with secondary thyroid swelling posted for tumor excision and biopsy under general anesthesia.

Case presentation

A 64-year-old male weighing 70 kg came with progressively increasing painless swelling in the left infra-auricular region since the last 6 months with a recent change in voice. He had another swelling since the last 3 months in the front of the neck but with no features suggestive of hypo/hyperthyroidism. He was a tobacco addict for the past 5 years with an abstinence period of 6 months. He was an engineer employed in a multinational company and vegetarian since birth.

On examination, he was calm, conscious, and very cooperative. His clinical examination revealed a regular pulse rate of 72/min, blood pressure 126/78 mmHg, and respiratory rate 16/min. Systemic examination revealed

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no significant abnormality in the cardiovascular, respiratory, and central nervous system.

Local examination of infra-auricular mass revealed a diffuse non-tender swelling starting from the left angle of the mandible, extending up to the clavicle inferiorly and medially up to 1 cm lateral to the clavicular head of the left sternocleidomastoid. There were no skin changes on the swelling, but it was fixed to the posterior structures of the neck.

On examination of neck mass, there was a 5 × 5-cm smooth, firm, non-tender swelling in the midline of neck originating 3 fingers from mentum up till supraclavicular notch which moved on deglutition. It was not possible to get one's fingers under the swelling.

Detailed airway examination revealed mouth opening (2 finger breadths) with many missing lower and upper teeth. Inter-incisor gap was > 4 cm and MMG (Modified Mallampati Grade) grade 2. However, TMD (thyromental distance) was 4 cm and there was restricted neck flexion and extension as well as jaw protrusion with ULBT (upper lip bite test) class 3. All these findings

were consistent with anticipated difficult mask ventilation, laryngoscopy, intubation, and front of neck access.

ECG (electrocardiogram) and all blood investigations were within normal limits. The chest X-ray postero-anterior (PA) view showed no tracheal deviation and the lateral view did not show any appreciable compression or retrosternal extension (Fig. 1). We ordered a CECT (contrast-enhanced computed tomography) neck for elaborate information on the twin masses. It showed enlargement of both lobes of thyroid with calcification and few cystic areas and no evidence of metastasis. However, the left pyriform fosse was effaced along with the anterior shift of the left thyroid cartilage by the mass effect from the left lobe of the enlarged thyroid. Another large heterogeneously enhancing lesion 6 × 4 cm on the left side of the neck near the carotid sheath was seen with loss of fat planes. The lesion was causing encasement of internal and external carotid arteries with significant luminal narrowing and faint intraluminal contrast seen. It was extending into the left parapharyngeal space with loss of fat plane and adjacent structures. The deep lobe



Fig. 1 Chest X-ray lateral view

of the parotid was also involved with ill-defined fat planes.

Fine needle aspiration cytology (FNAC) was done on both the masses revealing Bethesda category II colloid goiter with cystic degeneration and no evidence of metastasis. FNAC left infra-auricular swelling showed poorly differentiated carcinoma. Indirect laryngoscope with 70° endoscope revealed a growth involving aryepiglottic fold, arytenoids, true vocal cords, and false vocal cords with non-visible glottic chink.

As elective tracheostomy was not a feasible option for securing airway before surgery in this patient, we planned awake nasal fiberoptic intubation. No sedation was given as complete occlusion of the trachea could occur after induction of anesthesia due to the relaxation of pharyngeal and laryngeal muscles which kept the glottis patent during spontaneous respiration.

>After explaining the procedure to the patient, adequate premedication with injection glycopyrrolate 0.005 mg/kg, injection ranitidine 50 mg, and injection ondansetron 0.08 mg/kg was given. In the preoperative ward, nebulization was done with 4 ml of 4% lignocaine, and nasal pledgets soaked with lignocaine 2% were inserted in both the nares. Along with it, xylometazoline drops were applied. Topicalization of the oropharynx was done with 10% lignocaine spray 2–3 puffs.

In the operation theater, standard monitors were applied. The difficult airway cart was kept ready with all the necessary equipment including jet ventilation apparatus and cricothyroidotomy cart while otolaryngologists were asked to

prepare for emergency tracheostomy if the need arises. Appropriate size nasopharyngeal airway was inserted and attached to an endotracheal tube connector to form a nasal trumpet to which the breathing circuit was attached to accomplish pre and para oxygenation. A smaller-sized endotracheal tube (5.5 mm internal diameter) was mounted on to the FOB (fiberoptic bronchoscope) in view of the smaller glottis opening. A 10-ml syringe was loaded with 2% lignocaine for spraying when required (spray as you go). FOB was advanced via the nostril toward the oropharynx, but nothing was visualized. There were excessive secretions in the mouth despite premedication which were suctioned. As some degree of anterior shift of thyroid cartilage was evident on CT scan, 2–3 attempts were taken with incremental upward angulation of the tip of the scope to visualize the laryngeal and esophageal inlet (Figs. 2 and 3). The growth was seen on the left pyriform fosse with highly edematous left aryepiglottic fold and both false cords and no part of true vocal cords visible (Fig. 4). The scope was negotiated through the laryngeal inlet with great difficulty and once tracheal rings were seen further advanced toward the carina (Fig. 5). A 5.5-mm ET tube was advanced over the FOB and the scope withdrawn thereafter. The breathing circuit was attached and the position of the tube confirmed by auscultation over the chest and ETCO₂ (end-tidal carbon dioxide) graph. The patient was induced and the surgery was uneventful. Post-operative tracheostomy was done because of pre-existing laryngeal edema diagnosed on FOB and chances of post-operative exacerbation.



Fig. 2 Growth seen in the per laryngeal area with laryngeal and esophageal inlets



Fig. 3 Growth seen in the per laryngeal area with laryngeal and esophageal inlets

Discussion

A non-metastatic colloid goiter co-existing with poorly differentiated laryngeal carcinoma is a unique finding and among the first ones to be reported in literature. The airway management in such a patient with reduced glottic diameter and distorted pharyngolaryngeal

anatomy due to laryngeal growth as well as compressive symptoms due to thyroid growth requires expert airway handling to minimize the number of attempts, risk of bleeding, trauma, and laryngeal edema.

Fiberoptic intubation has improved the success rate in difficult intubations manifolds according to recent



Fig. 4 Peri-laryngeal edema with true vocal cords not visible



Fig. 5 Anterior laryngeal shift with distorted glottic aperture made fiberoptic manipulation through the glottis difficult

studies. In a case report by Pang et al. where a large tracheal tumor covering 90% of the lumen caused difficulties in endotracheal intubation via direct laryngoscope, fiberoptic-assisted endotracheal intubation with 5 mm ID ETT tube reduced the time to intubation to 3 min and prevented any peri-procedural complications (Pang et al., 2015). Also, a satisfactory level of topical anesthesia is quintessential for good patient acceptance in such cases, but it should be done by those with specialist training (Wahidi et al., 2011).

However, it is wise to be prepared with alternate methods of securing airway in case of any emergency during or after failed FOB like retrograde intubation, cricothyroidotomy, and surgical tracheostomy. We encountered a lot of difficulty in intubating the trachea despite using FOB due to increased secretions and minimal glottis opening available for negotiation of the tube. Studies suggest that many methods can be used to facilitate better laryngeal view in these cases like combined DL (direct laryngoscope) or video laryngoscope and FOB or intubation by FOB via laryngeal mask airway (Kholy & Mohamed, 2013; Shindo et al., 2018). But one must always remember cases of failed intubation may still arise with some managed by awakening the patient while others requiring surgical access. Vigilance is required to recognize the need for surgical access in cases of impending airway compromise.

Conclusion

Successful management of difficult airway using awake fiberoptic intubation requires the operator to have technical expertise in handling the equipment and troubleshooting apart from experience-based learning. Thus, it is of prime importance to introduce well-planned, methodological airway governance algorithm, airway skills training, and educational programs in institutions for evaluation of both the procedural skills and proficiency in FOB. Keeping a difficult airway registry in every anesthesia department for documentation of everyday case scenarios should further help in retrospective discussions and future reference.

Abbreviations

MMT: Modified Mallampati classification; FB: Fingerbreadths; TMD: Thyromental distance; ULBT: Upper lip bite test; FNAC: Fine needle aspiration cytology; ENT: Ear, nose, and throat; DL: Direct laryngoscope; CECT: Contrast-enhanced computed tomography; ETT: Endotracheal tube; FOB: Fiberoptic bronchoscope

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Authors' contributions

CB has done the concept, design, collection of data, analysis of data, manuscript preparation, and manuscript editing. BR has done the concept, design, analysis of data, and manuscript preparation. RS has done the design, analysis of data, manuscript preparation, and manuscript editing. PVR has done the design, collection of data, and manuscript editing. The manuscript has been read and approved by all the authors, the requirements for authorship have been met, and each author believes that the manuscript represents honest work.

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Need for approval was waived off as per institutional protocol for case report publication.

Consent for publication

The authors declare that they have obtained the patient's written informed consent to publish all data including photographs and other clinical information in the journal. He/she understands that his/her name, initials, or any other proof of identity shall not be revealed in any form in the manuscript; however, anonymity cannot be guaranteed.

Competing interests

There are no conflicts of interest.

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