

CASE REPORT

AIRWAY MANAGEMENT

A 'can't intubate, can't oxygenate' situation during an elective redo thyroid surgery; successful rescue and the lessons learnt

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Abstract

Pre-operative assessment of a patient for routine redo thyroidectomy requires a detailed airway assessment, clear documentation and formulation of an appropriate airway management plan by the anesthetist. Failure to identify problems related to oxygenation and ventilation during surgery will cause grave consequences to the patient and an unpleasant experience to the anesthetist and the surgeon. Redo thyroid surgery can be challenging. There is a possibility of preoperative vocal cord palsy due to previous surgical insult and infiltration by tumour recurrence, that can lead to difficulty in ventilation following induction of anesthesia. Therefore, it is mandatory to perform a detailed assessment of the airway using conventional as well as the advanced techniques.

We report the lessons learnt from a 42-year-old, ASA I, male patient scheduled for a redo thyroidectomy who could not be intubated nor ventilated, following a "missed difficult airway," despite a clean history and the available past records. An emergency airway was declared and managed according to Difficult Airway Society (DAS) guidelines which finally resulted in a successful outcome.

Subsequent evaluation by the ENT team revealed an absent glottic opening due to bilateral vocal cord palsy which resulted in a "can't intubate, can't oxygenate" state in this patient.

Key words: Adult; Airway Management; Difficult Airway; Humans; Intubation, Intratracheal; Male; Morbidity / trends; Postoperative Complications / epidemiology; Thyroid Diseases / surgery

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1. Introduction

Preoperative assessment of the airway by the anesthesiologist is one of the key elements before routine surgery whereas, anticipation and preparedness for a difficult airway is invariably lifesaving. Thyroidectomy is the commonest endocrine surgery carried out around the world.¹ These surgeries usually do not pose significant challenges during airway management.^{2,3}

Although, there can be instances where the anesthesiologist will encounter a difficult airway. Therefore, meticulous preoperative airway assessment is of utmost importance. To evaluate an airway, and to assess the potential difficulty in its management, some conventional and some newer methods can be employed. This case report highlights a successful rescue of a difficult airway in a patient who underwent an elective

redo thyroid surgery with “missed assessment” of a difficult airway.

2. Case Report

Our anesthetic team was summoned to help in a situation of difficult intubation in the adjacent operating room. A 42-year-old ASA-I male patient had been induced with fentanyl 100 µg, propofol 120 mg and atracurium 40 mg for an elective redo thyroidectomy for recurrence of an invasive papillary carcinoma which had earlier been removed eight months back. On our arrival, his oxygen saturation was 94% and the ventilation was being maintained with bag-mask ventilation, after several attempts at intubation and one failed attempt at laryngeal mask airway insertion by the attending anesthetist. We followed the 2015 Difficult Airway Society (DAS) Guidelines in an attempt to manage his airway and provide oxygenation. We failed with Plan A, B and C of the DAS guidelines and a “can’t intubate, can’t oxygenate” (CICO) state was declared.⁴ His oxygen saturation dropped to 20%. We had a well experienced surgical team, who was able to perform a surgical tracheostomy within few seconds and his oxygen saturation picked up to 100% within minutes. Surgery was abandoned and the patient was reversed with neostigmine and glycopyrrolate, allowing him to wake up without any neurological consequences.

He underwent a successful redo surgery two-weeks later. The tracheostomy tube was exchanged with a reinforced endotracheal tube which was inserted through the existing stoma to facilitate surgery. At the end of the surgery, a fresh tracheostomy tube was reinserted. He was referred to the ENT team and discharged home 5 days later with a speaking valve and a follow-up plan.

A background survey revealed a few salient factors which could have prevented a CICO condition. He had a “difficult intubation” alert card following his previous surgery and he complained of frequent episodes of difficulty in breathing when lying down. He denied of any recent change in voice.

This history and documentation had been missed during the preoperative assessment by the respective team. His pre-operative X-rays did not reveal any features suggestive of a difficult airway.

Subsequent to this episode an ENT follow up was undertaken by fiberoptic nasoendoscopy, and it was found that the glottic gap was absent and there was left sided vocal cord palsy with reduced movement of the right-side vocal cord, which led to a difficult airway.

3. Discussion

In routine general anesthesia, “can’t intubate, can’t ventilate” (CICV) or “can’t intubate, can’t oxygenate”

(CICO) situation is encountered in less than 1 in 5,000, out of which emergency surgical airway is required only by 1 in 50,000; yet it accounts for up to 25% of all anesthesia-related deaths.⁵

Specific causes identified for difficult airway in thyroidectomy include cancerous goiters, tracheal compression, retrosternal extension and a large gland,^{2,3,6} out of which the presence of a cancerous goiter is a major predictor for difficult endotracheal intubation.³ Apart from these factors, vocal cord palsy also can lead to narrowing of the glottis which was the cause in this patient. It was secondary to permanent vocal cord injury during previous thyroidectomy and infiltration of both vocal cords by tumour recurrence. The incidence of recurrent laryngeal nerve palsy after thyroidectomy is in the range of 3.5–6.6%; out of this the incidence of bilateral vocal cord paralysis is as low as 0.58%.⁷ A study has shown that 1.3 % of the patients who are scheduled for thyroidectomy can suffer preoperative vocal cord palsy, out of which 76% will have a malignant pathology.⁸ Thus, there was a high possibility for recurrent tumour infiltration contributing to vocal cord palsy in this patient.

The patient had in his possession a difficult airway alert card following his previous surgery which clearly stated the laryngoscopy view as Cormack-Lehane grade four. Furthermore, he had intermittent episodes of difficulty in breathing. Unfortunately, owing to a poor airway assessment during the preoperative period, predictors of a difficult airway were missed, and the patient suffered a life-threatening event and led to a close-call in anesthesia.

What should have been done differently?

Airway assessment for thyroid surgery should include a detailed history to identify symptoms of tracheal compression (e.g., exertional stridor, difficulty in breathing) and features of vocal cord involvement (e.g., hoarseness of voice), examination for tracheal deviation, retrosternal extension and imaging as appropriate. The recent introduction of ultrasonography in the operating rooms is a very reliable tool in the hands of the anesthetists to assess the patency of the airway as well as the real-time observation of the vocal cord movements. Although indirect laryngoscopy/ nasoendoscopy is not a routine practice, multiple risk factors together with clinical features suggestive of obstructive symptoms as in this patient warrant preoperative assessment by the ENT team.

As a part of preoperative work-up flexible nasoendoscopy can be utilized by the anesthetist in the elective and emergency settings to assess supraglottic and glottic pathology.⁹ The 4th National Audit Project of the Royal College of Anesthetists along with the DAS have highlighted the importance of imaging,

nasoendoscopy, or both in evaluating patients as in this case, who are considered at high risk of a difficult airway resulting in a 'can't intubate, can't oxygenate' (CICO) situation.⁹

Although most centers will issue a 'difficult airway alert card' to such patients, it is important to stress upon the patient to *produce* this card at the time of every subsequent surgery and mention the previous difficulties in the airway management.

4. Conclusion

This case report emphasizes the importance of meticulous airway assessment in order to prevent life threatening airway emergencies in patients presenting for redo thyroid surgery.

5. Conflict of interest

The authors declare no conflict of interest.

6. Authors' contribution

DJ: Conduct of the case, main writer

AA: Concept and corrections

VD: Proof reading and correction

7. References

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