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A NOVEL MANEUVER IN AIRWAY MANAGEMENT OF GOITRE: A CASE REPORT

Anaesthesiology

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Mass effect prevention, Goitre, Manual uplift, Induction of anaesthesia

INTRODUCTION

Airway management in patients with thyroid swelling is usually a challenge to anaesthesiologists during induction of anaesthesia. Thyroid swelling can cause compression of trachea (mass effect) leading to difficulty in bag and mask ventilation and also during endotracheal intubation.[1] Many ways of securing airway have been described. We present one such case of thyroid swelling where bag and mask ventilation was difficult initially but manually uplifting of the mass with both the hands, made feasible bag and mask ventilation and also laryngeal intubation.

CASE REPORT

A 65 years old woman, 58 kgs, posted for total thyroidectomy had presented with complaints of gradually increasing swelling in front of neck for past 5 years. The patient had mild respiratory difficulty on lying down position and also difficulty in deglutition. Clinically the patient was euthyroid. Patient was not on any thyroid medication. The neck swelling was painless and was mobile on deglutition. On examination patient was conscious, co-operative, pulse 90/min, blood pressure 140/90 mmHg, ECG showed sinus rhythm. She had no stridor and no change in voice. The front of neck swelling was 15 cm × 10 cm in size, smooth surface, well defined margin, firm in consistency, extending from lower jaw to below sternal notch and mobile on movement. On airway examination there was decreased neck flexion as well as decreased neck extension due to huge swelling over neck , mouth opening was three fingers, Mallampatti grade(MPG) II, thyromental distance could not be measured because of huge swelling over neck and multiple missing teeth were present. Indirect laryngoscopy showed bilateral vocal cord mobile and chink adequate. The contrast enhanced computed tomography (CECT) of chest and neck region was showing a large 8.6 cm × 8.2 cm × 8.5 cm peripherally enhancing centrally necrotic lesion in left lobe of thyroid gland with multiple foci of coarse calcification within. No extension was noted in retrosternal region but lesion was causing trachea to be shifted to right due mass effect.

The anaesthetic procedure was explained to the patient, informed and written consent was taken. The patient appeared to be conscious and cooperative. Patient was kept fasting for 6 hours for solids and 4 hours for water before surgery. Tab. ranitidine 150mg was given with ½ glass of water at night before and in the morning of surgery.

After arrival in the operation theatre monitoring of electrocardiogram (ECG), heart rate(HR), non-invasive blood pressure (NIBP), pulse oximetry(SpO2), end tidal CO2(EtCO2), respiration rate, temperature was instituted. Intravenous line was secured in left hand with 18G cannula and RL was started. Difficult intubation cart was kept ready.

Premedication was done with inj. glycopyrollate 0.005mg/kg and inj. midazolam 2mg IV. Preoxygenation was done with 100% O2 for 3 minutes. Induction of anaesthesia was done with inj. propofol 2mg/kg and sevoflurane initially 2% and then increased to 4% gradually. Check ventilation and check direct laryngoscopy was performed before giving muscle relaxant. Initially we were not able to ventilate the patient. Then, immediately senior anaesthesiologist manually uplifted the swelling with both the hands, this eased our ventilation with bag and mask. The EtCO2 that was not visible previously had now become graphically visible. This maneuver was omitted and laryngoscopy was performed. On direct laryngoscopy now, we were able to visualize epiglottis only but vocal cords were not visible which became visible after manually uplifting the swelling again. Now non - depolarizing neuromuscular blocker (NDNMB) given was inj. vecuronium 1mg/kg. Fiberoptic cart was kept ready. Intermittent positive pressure ventilation (IPPV) was possible with manual uplift maneuver. After IPPV with 100% O2 airway was secured with flexometallic endotracheal tube of 7 mm internal diameter which was rail road over stylet. Bilateral air entry checked and endotracheal tube fixed. While doing endotracheal intubation an anaesthesiologist kept lifting up the swelling to avoid compression of trachea due to mass effect. After securing airway opioid analgesic inj. morphine 0.1mg/kg was administered.

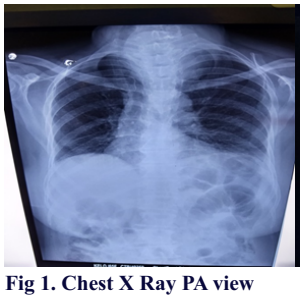

Fig 1. Chest X Ray PA view shows tracheal deviation to right side

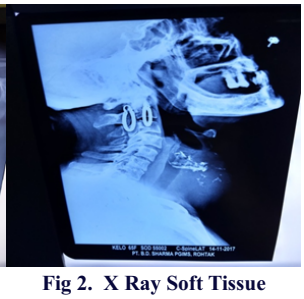

Fig 2. X Ray Soft Tissue Neck (STN) shows large swelling in front of trachea

Maintenance of anaesthesia was done with O2, N2O 50%, sevoflurane and non-depolarizing neuromuscular blocker (NDNMB) inj. vecuronium 1mg intermittently. IV fluid given was RL, vitals remained stable and perioperative period was uneventful at the end of surgery.

On return of spontaneous ventilation reversal agent inj. glycopyrollate 0.010mg/kg and inj. neostigmine 0.05mg/kg were administered. On direct laryngoscopy we localized normal mobility of vocal cords. Deflation of cuff was done to check peritubular leak. Swallowing and deglutition reflexes checked and patient was extubated once conscious, vitals stable, patient was shifted to recovery.

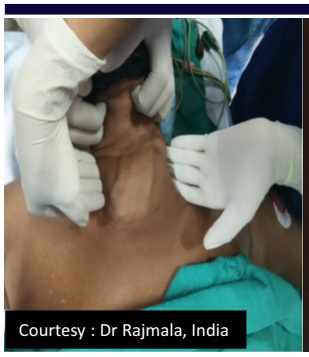

Fig 3. Manual uplift during Bag and Mask

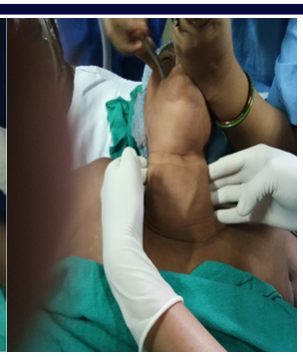

Fig 4. Manual uplift during Endotracheal Intubation

DISCUSSION

Large thyroid swelling is known to cause difficulty during induction and intubation. Difficulty with intubation may be caused by an enlarged thyroid gland due to tracheal deviation, compression, or both.[2] Amathieu et al. concluded that classical predictive criteria like mouth opening <35 mm, Mallampati grade (MPG) III or IV, limited neck movements <80°, and thyromental distance were reliable predictors of difficult airway.[3] Induction of general anaesthesia in such cases could be risky because it may precipitate complete airway closure and make mask ventilation and tracheal intubation nearly impossible. Pressure on trachea exerted by a long-standing neck mass could have caused laxity to the parts of tracheal wall, which can lead to complete collapse of the airway with muscle relaxation.[1] Amathieu et al. reported that the overall incidence of difficult intubation in thyroid surgery was 11.1%.[3]

There are multiple modalities to manage the difficult airway in the patient with thyroid enlargement however it depends on the anaesthesiologist's expertise and familiarity. If the enlargement is small, and there is no deviation or compression, and if the airway examination is normal, then we would proceed for a normal airway management. Bouaggad et al. found in his study that there was an easy tracheal intubation in 36.9% patients and mild tracheal difficult intubation in 57.8% patients. However, 5.3% patients have moderate to major difficult airway.[4,5]

Preoperative imaging studies gives us details of the tracheal deviation (tracheal shift of 1 cm from midline), degree of tracheal compression (<30% narrowing of tracheal diameter) and tracheal cartilage erosion suggestive of tracheomalacia.[4] An awake fiberoptic intubation can prevent conditions like “can’t ventilate and can’t intubate” scenarios occurring after induction of anaesthesia due to a complete tracheal collapse.[6]

An awake fiberoptic intubation avoids tracheostomy and its complications in the patients with thyroid swelling. Tracheostomy cannot be planned in such cases, because of the anatomical restrictions. Blind nasal endotracheal intubation needs inhalational induction, which may lead to total airway obstruction. Multiple attempts and trauma to the airway that leads to infrequent success in blind intubation was mentioned by Ovassapian et al. in their study.[7]

Saxena et al. mentioned that awake fiberoptic intubation prevents much bleeding and edema that leads to higher success of airway management.[8] Sendasgupta et al. and Tan and Esa stated in their studies that awake fiberoptic intubation offers more hemodynamic stability, better patient tolerance and patency of the airway.[9,10] Eldawlatly et al. stated that the success of awake fiberoptic is based on preoperative airway assessment that predict difficult airway, proper planning, and it is well-tolerated if explanation is given to the patient about procedure, risk and comorbidities.[11] Eldawlatly et al. had also stated that the airway access under local anaesthesia constitutes better alternative to failed fiberoptic intubation.[12]

In our patient mouth opening was adequate. There was no intraoral airway abnormality. There was no retrosternal extension. So we did not plan for any awake fibreoptic intubation and decided to sedate the patient and do check ventilation and laryngoscopy. This point itself we found difficulty in ventilation and laryngoscopy. Our manoeuvre of uplifting the thyroid manually made airway management a success.

CONCLUSION

In patients with huge thyroid swelling a new approach could be by manually uplifting swelling with the help of an assistant. This new approach can be one of the alternatives to ease airway difficulty in managing the patients with huge thyroid swelling whose MPG is grade II, those patients who have mobile thyroid swelling and MPG I up to MPG II where the mass is liftable. So remember to check liftability of thyroid swelling as the new parameter for airway management.

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