

Failed fiberoptic intubation and surgical tracheostomy in a case of Down's syndrome with goiter

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Difficult airway management is a great challenge to the anaesthesiologist. Fiberoptic intubation is a well-established technique in anticipated difficult airway but rarely does it fail due to some abnormality, where elective tracheostomy is an option to secure the airway. We report a difficult scenario of failure of most commonly recommended techniques to secure the anticipated difficult airway in an adult patient having Down's syndrome with mental retardation and goiter causing tracheal compression. Awake fiberoptic bronchoscopy assisted intubation under local anaesthesia was planned. Negotiation of the scope up to the larynx was not possible due to anomalous laryngeal structure, mucosal polyps and multiple angulations of the airway. Two attempts of blind nasal intubation also failed. So the decision of surgical tracheostomy under local anaesthesia was taken. Due to the presence of thyroid swelling, distorted tracheal anatomy and patient's lack of cooperation tracheostomy was unsuccessful.

Keywords: difficult airway, fiberoptic intubation, tracheostomy

Introduction

Down's syndrome (Trisomy 21) is a chromosomal abnormality commonly associated with mental retardation, cardiac/airway anomalies, metabolic and thyroid disorders. The difficult airway is anticipated in these patients due to obesity, short neck, macroglossia, hypertrophied tonsils or airway malacia leading to obstructive sleep apnoea (OSA).¹ Role of flexible bronchoscope in anticipated difficult airway is well proven but in certain situations there can be failure where conventional tracheostomy is an alternative method of securing airway.^{2,3} We report a case of Down's syndrome posted for subtotal thyroidectomy where there was failure of fiberoptic intubation and tracheostomy.

Case study

A 35 years old male having Down's syndrome with mental retardation presented with neck swelling since 3 months, and change in voice and increasing breathlessness while sleeping since 15 days. History of recurrent URTI, snoring and OSA was present. On assessment BMI was 31kgm². Neck was short with a circumference of 50cm and an extension up to 45°. A diffuse non

tender swelling of size 8x5x3cm more on right side of the neck with a non palpable lower border was present. Both nostrils were partially obstructed. Mouth opening was 2 fingers, Mallampati grade IV, macroglossia and a thyromental distance of 6 cm. Pulse rate was 80/min, BP-130/80mmHg, RR-24/ min and SpO₂ of 96% on air. Mild grunting was present at rest. Systemic examination was normal except mental retardation.



Figure 1: Preoperative patient.

Investigations-Routine blood investigations were normal. T3-134ng/ml, T4-8.1mcg/ml, TSH-2micIU/ml, ECHO- EF- 49 %, ECG – normal. On

Indirect laryngoscopy multiple mucosal polyps were seen obstructing the laryngeal inlet and vocal cords were not visualized.
 FNAC– Colloid goiter.



Figure 2: X-ray neck AP/Lateral view.
 CT scan /USG- reported multi nodular hyperplasia of thyroid gland with retrosternal extension causing compression of trachea.



Figure 3: CT scan of neck and chest.

Anaesthesia technique

Informed consent was taken following explanation of the high risks of local/regional and general anaesthesia for surgery (and if required tracheostomy). Premedicated with ranitidine 50 mg, metaclopramide 10 mg, ondansetron 4 mg, glycopyrrolate 0.2mg and midazolam 1mg intravenously(IV). Monitoring for HR, ECG, NIBP and SpO₂ was started. Anticipating difficult mask ventilation and intubation with conventional laryngoscopy, flexible bronchoscopic assisted endotracheal intubation was planned. The nasal passage was sprayed with 0.05% oxymetazoline for decongestion and adequate topicalization of the

airway achieved with lignocaine. Fiberoptic bronchoscope lubricated with 2% lignocaine jelly and preloaded with 7.5mm ID cuffed Portex endotracheal (ET) tube was advanced nasally up to the laryngopharynx. Anomalous epiglottis, arytenoids, false vocal cords and mucosal polyps causing multiple angulations of airway were visualized.

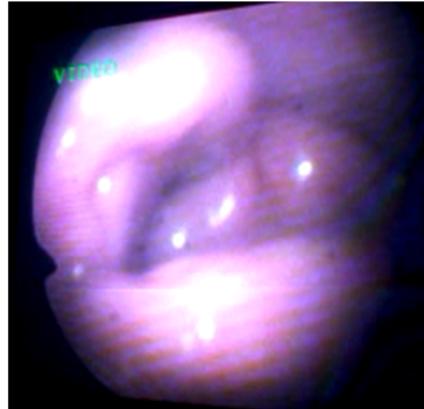


Figure 4: Bronchoscopic view of larynx.

Negotiation of the scope was not possible upto vocal cords so procedure was abandoned. As the air passage was already anaesthetized, blind nasal intubation was attempted twice with 7.0mm ID ET tube but failed. Hydrocortisone 100 mg and dexamethasone 8 mg IV was given as prophylaxis for airway oedema. Then it was decided to proceed for conventional tracheostomy under local anaesthesia (LA) and subsequent thyroidectomy, once airway is secured. Risk of failure of tracheostomy due to thyroid swelling or bleeding was explained. Before that in lateral position epidural catheter was placed 4cm cranially through 18G Tuohy epidural needle at the level of T1- T2 space to provide intra/post operative analgesia. Tracheostomy was attempted by an experienced ENT surgeon, however the tracheal rings were not appreciated after deep dissection in caudad as well as cephalic end. Due to distorted anatomy and excessive bleeding from thyroid tissue the procedure was abandoned. No epidural anaesthesia was given as the airway was not secured. Intraoperatively HR was 90-100/min, BP-140-150/80-90 mm of Hg and O₂ saturation of 98% on 4 liters of oxygen flow with the nasal cannula, later observed in the surgical ICU for 24 hours. Presently the guardians have opted for medical management.

Discussion

The classical predictive criteria to anticipate difficult airway in patients with thyroid swelling like mouth opening <35mm, Mallampati III/IV, short neck, neck mobility <80degrees, thyromental distance <65mm and retrognathic mandible were all positive in our case.⁴ Intubating laryngeal mask airway (ILMA) or video laryngoscope were not available so only reliable option was awake fiberoptic intubation as per the ASA guidelines.² Attempts to improve visualization like additional topical LA spraying, rotation of neck and scope, use of shoulder pillow and small size ET tube No.7 were made but failed to negotiate the bronchoscope. Parnell D and Mills J reported use of awake Fast-trach LMA for intubation as an alternative to fiberoptic bronchoscopic intubation under LA in an adult with rheumatoid arthritis of all joints and cervical spine.⁵ LMA C Trach improves visualization but failure to intubate through it in cases with lingual tonsil hyperplasia is also reported.⁶ Asai T et al reported intubation with Pentax AWS airway scope following failure of fiberoptic bronchoscopic intubation and ILMA in a patient with laryngo-pharyngeal swelling posted for cervical spine re-surgery.⁷ Currently fiberoptic airway scopes has taken a definitive place in difficult airway algorithm with higher chance of airway control.⁸ Successful uses of cervical epidural anaesthesia (CEA) as a first plan for thyroid surgeries are also documented.^{9, 10} In our case having laryngeal anomaly safety in using LMA as an elective/rescue method was questionable that too following failure of above measures. We avoided sole use of CEA because a better back up plan was needed to secure the airway in emergency.

In conclusion awake fiberoptic intubation can fail and an alternative plan like awake ILMA assisted fiberoptic visualization or advanced airway scopes must be kept ready and one should be well versed with the technique to tackle the difficult airway scenario safely.

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