

# Ventilating Bougie Guided Flexo-metallic Tube Intubation With Airtraq- Not A Technique Of Choice?

Sunil Chapane<sup>1</sup>, Sweta Salgaonkar<sup>1</sup>, Salman Tadvi<sup>1</sup>

## Abstract

**Introduction:** Airtraq, a type of video-laryngoscope used for endotracheal intubation requires less manipulation of airway axis like neck extension. We report a case of awake Airtraq assisted oral intubation in a 55 year old female posted for calvarial bone graft on face and microstomia repair having an inadequate mouth opening. We had a failed attempt of advancement of flexometallic tube over ventilating bougie with Airtraq. We think a flexometallic tube with Airtraq is not the right combination but it needs further evidence to prove.

**Keywords:** Difficult airway, Awake Intubation, Airtraq, Ventilating Bougie.

## Introduction

Old faciomaaxillary trauma may pose as difficult airway for anesthetic management. Awake fiberoptic intubation has been the gold standard for airway management of anticipated difficult airway cases [1,2,3]. Airtraq is an indirect optical video-laryngoscope which provides optimum glottic view without manipulating all three airway axis which are required in conventional direct laryngoscopies. Airtraq can be used for endotracheal intubation of difficult airway cases where mouth opening is restricted [4,5,6]. Awake Airtraq intubation can be performed in difficult airway cases after adequate preparation of airways. Flexometallic tubes are preferred in maxillofacial surgeries because of their kink resistant nature and flexibility in fixed position [7,8]. Due to the flexibility of flexometallic tube, it needs to be guided over stylet or ventilating bougie for endotracheal intubation [9]. We had a patient of old facial trauma following vehicular accident with pan facial fractures undergone open reduction internal fixation and free radial flap on left

side of face for soft tissue loss and exposed bone. This patient had lost left nostril due to free flap cover.

We planned awake oral intubation using Airtraq with flexometallic tube in microstomia with single right nostril for face bone graft and microstomia repair. Airtraq with flexometallic tube posed difficulty in advancement of tube over ventilating bougie so we had to use polyvinyl chloride (PVC) ET tube after consulting the surgeons.

## Case Report

Fifty-two years old female weighing 48kg with a history of facial deformity following pan facial trauma due to vehicular accident was posted for calvarial bone graft for frontal bone defect and mouth reconstruction surgery. Patient had a history of previous tracheostomy during acute pan-facial trauma for airway protection and consequent surgeries. Patient had undergone bilateral zygoma, left frontal bone and left mandible plating under general anesthesia followed by free radial flap on left side of face for soft tissue

loss and bone exposure. Patient needed regular nasopharyngeal airway dilatation to maintain patency of her right nostril while left nostril lost an under-flap.

She had undergone facial flap thinning under sedation and tumescence anesthesia. Patient had no history of any medical illness, allergy or addictions.

On pre-operative airway examination, Mallampati score was class IV with inadequate mouth opening with inter-incisor distance 2 cm and 4 cm horizontal dimension due to encroachment of flap on left angle of mouth (Fig.1). Right nostril was patent, other airway findings were normal. Neck anatomy was assessed for feasibility of topical airway blocks. Laboratory investigations, chest X-ray and ECG were within normal limits. General and systemic examination was normal. Patient was counselled for awake oral intubation.

Patient was informed about the anesthetic plan, surgical procedure and a written informed consent was obtained. We anticipated difficulty in mask ventilation due to deformed anatomy with single nostril and difficult intubation due to restricted mouth opening. For cosmetic purpose, surgeons advised not to open angle of mouth under local anaesthesia (LA). Patient had a scar from previous tracheostomy and a re-tracheostomy would have its own complications, therefore, we planned awake Airtraq guided flexometallic intubation. Plan A was awake oral intubation using Airtraq

<sup>1</sup>Dept. of Anesthesia, Seth G S Medical College and KEM Hospital, Parel, Mumbai.

### Address of Correspondence

Dr. Sunil Chapane  
Dept. Of Anesthesia, First Floor, Old Building,  
Seth GSMC and Kem Hospital, Parel,  
Mumbai - 12.  
Email : drgunyalsagar@gmail.com



Dr. Sunil Chapane



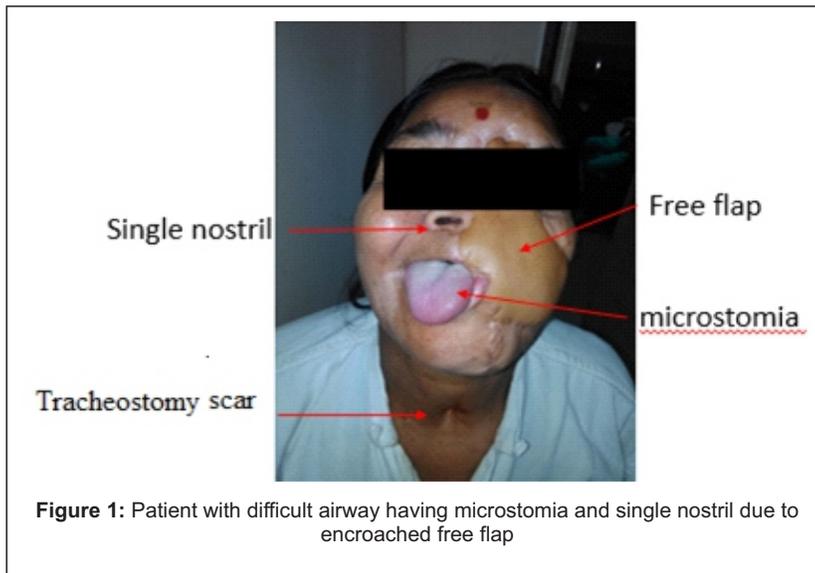
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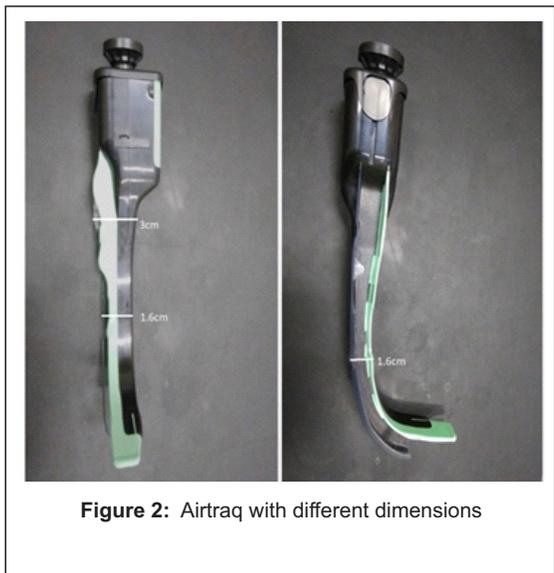
Dr. Salman Tadvi

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**Figure 1:** Patient with difficult airway having microstomia and single nostril due to encroached free flap



**Figure 2:** Airtraq with different dimensions

with flexometallic tube after adequate airway preparation under sedation.

Plan B was opening of microstomia under local anesthesia and sedation and Airtraq guided intubation under general anesthesia. Plan C was elective tracheostomy under LA and sedation followed by general anesthesia. Airway was prepared with topical anesthesia with 10ml of 4% viscous lignocaine gargles and 2ml of 4% lignocaine nebulization in preoperative area. The patient was given intramuscular inj. Glycopyrolate 0.4 mg 30 min prior to going inside the operating theatre as anti-sialogogue. Once inside, routine monitors like pulse oximeter, electrocardiogram (ECG), non-invasive blood pressure (NIBP), end tidal carbon dioxide (ETCO<sub>2</sub>) and temperature were attached. All baseline parameters were normal. Midazolam 1mg, fentanyl 100mcg given intravenously after securing intravenous line. Sedation was maintained with dexmedetomidine infusion at 0.5mcg/kg/min. Bilateral superior laryngeal nerve and glossopharyngeal also blocked by injecting 2% lignocaine 2ml on each side. Thus, oral, oropharyngeal and supraglottic structures were anaesthetized. Trans-tracheal injection at cricothyroid membrane was given with 2ml of 4% lignocaine and patient was encouraged to cough to anaesthetize the infra-glottic structures.

Cuffed 7mm flexometallic tube was preloaded with ventilating bougie on No. 2 green colored Airtraq whose dimensions were adequate for oral intubation in this case (Fig.2). We introduced this assembly orally after confirming adequate sedation and topical anesthesia. Glottic view was

Cormac Lehane Grade I. Flexometallic endotracheal tube (ETT) was tried to advance into trachea by forward force and rotatory movement of tube over ventilating bougie with stylet but advancement of the flexometallic ETT over Airtraq was not possible. So, we removed flexometallic tube and ventilating bougie without removing Airtraq from mouth, 7mm cuffed PVC endotracheal tube was inserted through Airtraq channel into trachea after consulting the operating surgeons. Endotracheal intubation confirmed by clinical examination and capnography. Throughout this procedure patient was comfortable, well sedated, awake and maintained saturation. Patient was anaesthetized with propofol and muscle relaxant was given. Post-induction check laryngoscopy was done to see the glottic view which was Cormac Lehane Grade IIb but mouth opening was less so introducing tube would have been difficult obscuring glottic view with conventional laryngoscopy. Whole surgical procedure was uneventful. Patient was extubated after she was fully awake and full reversal of muscle relaxant was obtained.

#### Discussion

In our case, patient had inadequate mouth opening with compromised nasal anatomy showing small snares, constricted nasal cavity and awake fiber-optic intubation is done preferably through nose than mouth. Due to all these problems and non-availability of fiber-optic bronchoscope, we decided to go for awake Airtraq oral intubation.

Tracheostomy is an invasive procedure and has its own complications and patient had previously undergone tracheostomy during acute trauma for multiple facial fractures for airway maintenance and surgeries. Awake blind nasal procedure was avoided to prevent trauma to the nasal cavity which might compromise her only nostril and also because of the possibility of injury to airway due to blind technique.

Due to small dimensions of Airtraq, it can be used in cases of restricted mouth opening. Also, preformed curvature of Airtraq airway axes alignment is not necessary and intubation is possible without neck extension. Due to overlying buccal flap, tissue was not stretchable so improvement in mouth opening under anesthesia was not expected. As patient was posted for mouth reconstruction surgery along with frontal bone graft, flexometallic tube was selected for flexibility position of tube so surgeons can work around the tube. Flexometallic tube is difficult to pass through cords without bougie or stylet. So, flexometallic tube with ventilating bougie is preloaded in a channel next to the optical pathway. Ideally Airtraq should be in midline, but in this case, as the left side of angle of mouth was encroached upon by flap, introduction of Airtraq in the midline oropharynx was slightly difficult. During intubation attempt, ventilating bougie with flexometallic tube did not advance through vocal cords after visualizing glottic view by Airtraq due to excessive flexibility of tube. Tube made up of polyvinyl chloride material can be advanced over Airtraq without any

difficulty.

Valmiki et al. also had same difficulty with flexometallic tube over Airtraq during awake intubation in patient with large thyroid posted for thyroidectomy [10].

### Conclusion

Optimum airway preparation and adequate sedation is necessary for patient cooperation during awake intubation. Airtraq guided awake intubation can be done in difficult airway cases [4,5,6]. Minimum of 18mm of

inter-incisor distance and 30mm of horizontal dimension is required for intraoral introduction of Airtraq. Airtraq needs to be inserted in the midline for excellent glottic view and easy introduction of ETT. Bougie guided flexometallic tube awake intubation using Airtraq may be difficult due to unsuccessful advancement of tube over Airtraq. Flap tissue is less compliant compared to normal buccal tissue, therefore, it is not expected that it will stretch and improve in the mouth

opening during laryngoscopy which was true in our case. So, we propose that flexometallic tube with ventilating bougie and Airtraq is not a technique of choice for intubation as it is difficult to advance the tube over Airtraq due to excessive flexibility of tube and stiffness of stylet of ventilating bougie. Although, more evidence is needed to recommend that above combination is not advisable at all.

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