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# Blind Naso-Endotracheal Intubation

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## Abstract

Patients with 'difficult endotracheal intubation' may present for elective or emergency surgery. We present a case of a 29 year old female patient who required

general anaesthesia for resection of a large mandibular osteosarcoma where the blind nasoendotracheal intubation technique was used.

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## Introduction

Airway management, especially for head and neck surgery poses challenges to the anaesthesia provider. Patients with a 'difficult airway' as defined by the American Society of Anaesthesiologists (ASA) may present for emergency or elective surgery for the head, neck or other body regions (1).

The Difficult Airway Society has algorithms and practice guidelines for management of the 'difficult airway'(2). The fiberoptic bronchoscope is recommended for use in patients with an anticipated difficult intubation (3,4). The use of the fiberoptic scope is limited to: availability of the device due to its cost and appropriate training of personnel .In Kenyan public hospitals, there are two fiberoptic bronchoscopes available only in the two main referral hospitals.

Blind nasoendotracheal intubation is the technique whereby a tube is passed into the trachea through the nose without use of a laryngoscope. The technique was pioneered by Magill and Rowbotham after the First World War as an alternative to oral intubation to facilitate surgical access for head and neck surgery at the Queens Hospital (5). Magill et al found that with the patient's head held in a certain position,the inspiratory catheter and expiratory tube could be made to enter the trachea without the aid of laryngoscope (5). The ability to intubate the trachea without use of a laryngoscope is a valuable skill.

## Case Report

A 29 year old female with osteosarcoma of the mandible was scheduled for elective surgery under general anaesthesia. During the pre-anaesthetic evaluation the patient was not able to phonate due to the size of the tumour and used sign language and written communication. The pre-anaesthetic

history revealed that the mass had rapidly increased in size over the preceding three months. Due to the large size of the mass, the patient was incapable of ingesting orally, swallowing saliva and could not lie supine. On assessment of the airway there was a large irregular mass, protruding from the oral cavity with areas of necrotic tissue (Figure 1). The tongue could not be identified. She was drooling foul smelling saliva and had a nasogastric feeding tube in situ. The neck was adequately mobile. The patient's airway was classified as Mallampati IV (6). Her physiological status was classified as ASA class II (7).

Relevant pre-anaesthetic instructions included: an explanation of her airway management; that it was going to be an awake technique; the patient was not to ingest anything via the nasogastric tube for at least six hours before scheduled time of surgery and she was to receive atropine (0.6 mg I.M) as premedication half an hour before being wheeled to the operating room.

A 'can't intubate can't ventilate' scenario was anticipated (2). In preparation for this and in accordance with the Difficult Airway Society guidelines, nasopharyngeal airways and equipment to secure a surgical airway: emergency cricothyroidotomy and tracheostomy were availed. In addition two physician anaesthesiologists were present and an Ear Nose and Throat surgeon who was to perform tracheostomy if need arose was available.

In the sitting position and with monitors in place, lignocaine 2% was instilled through both nostrils and the patient encouraged to gaggle. The head was supported in the 'sniffing morning air' position[8]. An endotracheal tube size 6.5mm was passed via the right nostril into the nasopharyngeal space. Lignocaine 2% was instilled via the endotracheal tube during inhalation so as to anaesthetise the nasopharynx and the vocal cords.

The tube was then passed into the trachea gradually during the inspiration phase. This was aided by listening to breathe sounds on the proximal end of the tube and looking at the patient's chest for expansion. Chest auscultation and use of capnography confirmed

correct tube placement (Figure 2). The tube was secured by sutures and use of adhesive tape.

The intra-operative anaesthetic management was uneventful and the patient was successfully extubated post operatively (Figure 3)



Figure 1. Patient before endotracheal intubation



Figure 2. Patient following successful awake nasotracheal intubation



Figure 3 Patient post-operatively following successful extubation

## Discussion

In the practice of anaesthesia the most important tenet is the safety and well-being of the patient. The integrity of the patient's airway is of mutual concern to both the surgeon and anaesthetist. Difficult endotracheal intubation techniques include, use of fiberoptic bronchoscope, intubating laryngeal mask airway, tracheostomy, blind nasotracheal and retrograde intubation. According to the Difficult Airway Society guidelines, intubating with the aid of a fiberoptic scope has taken its place as the standard adjuvant for management of an anticipated difficult intubation (3, 4, 9). If there is risk of reduced ventilation with institution of general anaesthetic drugs then an awake fiberoptic intubation using regional techniques to anaesthetize the airway is recommended (9). Its use is limited by: the need for appropriate user training and the high cost of acquiring the equipment.

In a survey of airway management practices amongst anaesthesiologists, Ezri et al and Kristensen et al demonstrated that they preferred an awake fiberoptic intubation technique to secure the airway in patients with predicted difficult endotracheal intubation (10, 11). In these surveys the fiberoptic scope was available, easily accessible and the different cadres of anaesthesiologists had been trained on its use. In

some circumstances using the fiberoptic intubation technique for 'difficult intubation' has failed and an alternative airway management technique such as tracheostomy has been used (12). Contraindications to use of the awake fiberoptic scope for intubation are related to: limited training on its use, presence of thick airway secretions, and the inability of the patient to cooperate (13).

In situations where a fiberoptic scope is not available or has failed for difficult endotracheal intubation, tracheostomy is usually performed (14,15). In our institution tracheostomy is usually performed in patients with 'difficult intubation'. Tracheostomy is associated with complications and some may be life threatening (16). These complications include bleeding, injury to adjacent structures, pneumothorax, tracheo-oesophageal fistula, surgical emphysema, displacement of the cannula, cannula blockage, tracheomalacia, pulmonary atelectasis failure to decannulate and longer recovery with a slower return to function (16,17). In addition the cost of tracheostomy may be high due to: use of tracheostomy kits, post-tracheostomy patient care in specialized units with increased demand on personnel proficient in tracheostomy care, physiotherapists, speech and language therapists [16]. Due to these complications, alternatives to elective

tracheostomy for patients with difficult intubation such as fiberoptic, blind nasotracheal and retrograde intubation are considered. In addition, a scoring system to help identify patients requiring an elective tracheostomy due to nature and extent of surgery has been developed (16). The intubating laryngeal mask airway as an alternative in the difficult intubation algorithm, was not feasible in this patient due to the presence of the large mass in the oral cavity.

Indications for awake blind nasotracheal intubation include a potentially difficult orotracheal intubation and patients in whom muscle relaxants are undesirable or contraindicated due to increased risk of hypoventilation (18). The ideal blind nasotracheal intubation technique though still described waned in popularity after the introduction of muscle relaxants in the 1940's and the advent of the laryngoscope (19,20). The blind nasoendotracheal technique requires practice and use of minimum intubating equipment (nasopharyngeal airways, endotracheal tubes and suction apparatus). The analgesia and technique for awake blind nasotracheal intubation is generally similar to awake fiberoptic intubation (9). The main difference between the two techniques is in the insertion of the endotracheal tube into the glottis. Using the fiberoptic bronchoscope technique, insertion of the tube into the glottis is aided by visualization of the glottic opening and passage of the endotracheal tube over the fiberscope while in the blind technique insertion is aided by use of breathe sounds. Confirmation of correct tube placement in both techniques is by use of capnography and auscultation of the chest for breathe sounds. Ezri et al demonstrated that senior anaesthesiologists faced with a 'difficult intubation' preferred to use the fiberoptic bronchoscope as it was available though they were comfortable at performing a blind nasoendotracheal intubation as well (10). Blind nasotracheal technique has been successfully used in the anticipated difficult intubation (21). Elstraete et al demonstrated that there was no difference in the success rate of endotracheal intubation using the blind nasotracheal and the fiberoptic technique (22). Both techniques were considered valuable in a difficult intubation scenario (22).

Despite the presence of various techniques for endotracheal intubation, all appropriate precautions must be taken and the blind nasotracheal intubation technique requires adequate proficiency and practice.

In the management of the anticipated difficult intubation the blind nasotracheal intubation technique is a safe, reliable and a cost effective alternative that requires the presence of minimum equipment.

## Acknowledgments

We are grateful to our patient who granted us permission to use their pictures.

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