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RESEARCH ARTICLE

A CASE REPORT ON AN UNANTICIPITATED DIFFICULT INTUBATION IN AN EMERGENCY DSA PATIENT

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ABSTRACT

Background: Anticipation of difficult airway, adequate preparation and prompt management is an essential part of every anesthesiologist's role. Failure to secure a patent airway can lead to fatal outcomes as a result of permanent cerebral hypoxia. ***Case Presentation:*** In this case of unanticipated difficult intubation in an elderly male with multiple comorbidities posted for an emergency procedure at odd hours, we describe a fiberoptic bronchoscope guided CMAC video laryngoscope assisted nasal intubation with constant backward, upward rightward pressure and adjustment of head and neck positions; ***Conclusion:*** Incidence of unanticipated difficult airway is more likely in elderly patients. Proper airway assessment is an essential part of the preoperative checkup and adequate preparations including a difficult airway cart is very important at all times.

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INTRODUCTION

Airway management is one of the fundamental responsibilities of the anesthesiologist. Whenever possible, difficult intubation should be anticipated which can now be quantified using the Intubation difficulty scale and a strategy should be developed. According to the American Society of Anaesthesiologist (ASA) definition, an intubation during which insertion of an endotracheal tube by an experienced anaesthesiologist requires more than three attempts or take more than ten minutes is defined as a difficult intubation (Janssens, 2001).

Difficult intubation is expected in elderly patients due to multiple factors like degenerative changes, dental loss and head and neck joint changes. It is important to plan for the degree of difficulty in endotracheal intubation before anaesthesia in elderly, as a delay in endotracheal intubation can cause fatal outcomes due to declined organ system function and other associated comorbid conditions with aging. To predict a difficult endotracheal intubation, patient's basic physical profiles including their age, sex, height, weight, and body mass index (BMI), head and neck movement, thyromental distance, interincisor gap, dentition, and Mallampati score can be assessed prior to induction (Hyoung-Yong Moon, 2013).

Tracheal intubation can be difficult because of either anatomical or physiological reasons. An anatomically difficult intubation involves challenges in viewing the vocal cords (difficult laryngoscopy) or passing a tube into the trachea (difficult endotracheal tube placement). A physiologically difficult intubation may be out of cardiopulmonary compromise, mostly manifested as hypoxemia or hypotension. In an anticipated difficult airway case, rescue devices such as an oropharyngeal airway, nasopharyngeal airway, bougie, laryngeal mask airway (LMA), video laryngoscope, fiber optic bronchoscope and cricothyrotomy equipment must be available (Jonathan, 2019).

Fiber optic tracheal intubation is a useful technique in patients with anticipated difficult airway. However, there are two major difficulties with this technique also. The first is location of the glottis and insertion of a fiber optic scope into the trachea. Induction of general anaesthesia causes the soft palate, tongue and epiglottis to approximate to the posterior pharyngeal wall and thus little air space is left in the oropharynx for manoeuvering the tip of the fiber optic

scope to locate the glottis. Several man oeuvres such as jaw thrust, extension of the head, or traction of the tongue and airway intubators are suggested to overcome this difficulty. The second difficulty is insertion of a tube over the fiber optic bronchoscope into the trachea. There have been reports of failed tracheal intubation despite successful insertion of FOB into the trachea (Asai, 2004)

CASE REPORT

An 80-year-old male patient, a known case of diabetes mellitus, hypertension and ischemic heart disease status post angioplasty, presented to the emergency department with complaints of sudden onset of weakness over right upper limb and lower limb and inability to walk or stand along with deviation of angle of mouth to the left. Symptoms progressed to worsening of weakness over right side of the body and inability to move right upper limb and lower limb, with slurring of speech. Patient was on anti-hypertensives, oral hypoglycemic agents and blood thinners.

On examination, he was conscious and confused with impaired comprehension. Pupils were bilaterally equal and reacting to light, 3mm in size. He had right upper motor neuron facial palsy, right upper and lower limb 0/5 power and mute right plantar reflex.

On airway examination, mouth opening was adequate, Mallampati class II, short neck and thyromental distance of 6 cm. Neck movement was full in flexion, extension and side to side.

On physical examination, pulse rate was 80/min, blood pressure 130/68 MM HG, SPO2: 100% on room air. Blood investigations were all within normal limits except high potassium levels. ECG showed changes suggestive of right bundle branch block and anterior wall myocardial infarction. Echocardiography showed dilated, depressed left ventricle, mildly dilated left atrium, thin scarred interventricular septum, akinetic, lateral wall hypokinesia, ejection fraction approximately 20 % and strong suspicion of left ventricular apical clot. MRI ANGIOGRAM revealed total occlusion of left carotid artery.

Considering the multiple comorbidities, poor cardiac function and emergency nature of the procedure, patient and relatives were counselled about the possible risks, the need for post procedure ICU stay and SOS ventilatory support in case of thrombectomy. A written informed consent with high risk was taken. The primary plan was to do DSA under monitored anaesthesia care and if thrombectomy planned, to do the procedure under general anaesthesia. Video laryngoscope, different size Endotracheal tubes, bougie, laryngeal mask airways, difficult airway cart and fiber optic bronchoscope were kept ready inside the hybrid OR considering the chances of unanticipated difficult airway.

Patient was taken in hybrid OR for emergency DSA SOS thrombectomy after confirmingthe starvation status. 2 wide bore IV lines were secured. All standard ASA monitors were attached. Heart rate was 82/min, blood pressure 148/68 mm hg on right arm in supine position, SPO2 99% on room air. O2 was started via a nasal prong @ 3l/min.

Cerebral DSA was done under monitored anaesthesia care. Diagnostic Cerebral Angiogram showed Left common carotid artery: Occlusion of internal carotid artery. The plan was to go ahead with thrombus aspiration and retrieval under general anaesthesia.

Patient was induced with injection fentanyl 1 mcg/kg and injection etomidate 0.2 mg/kg. Once the patient was under anaesthesia, injection rocuronium 1.2 mg/kg was given. Mask ventilation was easy. CMAC video laryngoscope was used for intubation. On laryngoscopy, Cormack Lehane grade IV was noted. Intubation attempt with the help of a bougie was unsuccessful. Patient was mask ventilated again. A McCoy blade 4 laryngoscope was used then; however, we were unable to pass the bougie. Then nasal fiber optic intubation was attempted, vocal cords were visualised and scope passed through the vocal cords, but tube could not be advanced beyond 22cm nasally. Second attempt at fiber optic intubation also resulted in the same.

Patient had an episode of ventricular tachycardia and preservative free Lignocaine was given intravenously stat, following which the rhythm reverted to back sinus. A Proseal LMA number 4 was inserted, through which the patient was getting adequately ventilated with normal airway pressures and maintained 100% saturation throughout. The procedure was started and thrombus aspiration and retrieval were done uneventfully.

Post-procedure, since the patient had to be electively mechanically ventilated in the ICU for at least 12 hours for neurological reasons, airway had to be secured with an endotracheal tube. A blunt tipped bougie as well as ventilating bougie were attempted to pass through the LMA. However, both attempts failed. Next, with the help of a fiber optic bronchoscope, airway was visualised through the LMA and vocal cords were visualised. There was no evidence of trauma, bleeding, secretions or significant airway edema. Then we removed the LMA. A 6.5 number North Pole tube was loaded over FOB, and fiber optic bronchoscope was introduced through the left nasal passage. Then CMAC video laryngoscope was introduced by an assistant and epiglottis was visualized. The epiglottis was then lifted up with the aid of the bronchoscope tip and FOB was passed through the cords. The North pole tube was advanced over the FOB while applying constant backward, upward rightward pressure and adjusting the head and neck positions. The tracheal rings were visualised and the tube was passed. FOB was removed and tube cuff inflated. Adequate ventilation and tube position was confirmed by auscultation and ETCO2.Tube position was reconfirmed with fiber optic bronchoscope. Patient was maintaining stable hemodynamics throughout and was getting ventilated properly. After half an hour of observation patient was shifted to ICU on ventilator.

DISCUSSION

Difficult intubations cannot be predicted always even after a thorough preoperative airway assessment. Therefore, our approach for any intubation should involve standardized preparation and execution in a manner that can address anatomical or physiological difficulties as they are encountered.

In the practice of predicting difficult endotracheal intubation, the degree of difficulty depends on interaction between various airway assessment factors rather than a single factor. Hence it is more appropriate to use combined factors than to use a single factor for the prediction. Naguib et al. (2006) proposed that a high Mallampati score, short thyromental distance and small interincisor gap are predictive factors for difficult endotracheal intubation. Roes and Cohen (Rose, 1994) reported that a reduced mouth opening, decreased thyromental distance, decreased neck mobility, and the combination of these factors allow for the prediction of difficult endotracheal intubation. Tse et al. (2002) reported a Mallampati score of 3, thyromental distance < 7 cm, head and neck movement ≤ 80, or a combination of these factors as predictive factors for difficult endotracheal intubation. The geriatric age group has low head and neck movement, a short thyromental distance, and poor dentition relative to the middle and young age groups. Previously conducted studies showed restricted head and neck movement, a small interincisor gap, a high Mallampati score, and rigid cervical joints were seen more frequently in the geriatric age group. This indicates that factors related to difficult endotracheal intubation increase with age; as a result, C-L grades of 3 or 4 were more common in the middle and geriatric age groups than in the young age group (Hyoung-Yong Moon, 2013).

Nasotracheal intubation is an effective and safe technique in patients with anatomically difficult orotracheal intubation. A fiber optic bronchoscope guided nasal intubation is always superior to a blind nasal intubation technique.

Difficulty in fiber optic intubation is associated with two major problems, the first being apnoea. Time taken to intubate and thus the duration of apnoea is longer for fiber optic intubation compared to intubation using a laryngoscope. If apnoea continues for a long duration, the patient may become hypoxic. In patients with preexisting cardiovascular and neurological compromised state even the shortest duration of hypoxia can be life- threatening. Sometimes after successful insertion of a fiberscope into the trachea, advancing a tube over the scope can still be difficult and the oxygen saturation starts falling. The second problem is damage to the upper airway. Multiple attempts at inserting a fiberscope into the trachea and advancing a tube over the scope increase the risk of injury to the larynx and surrounding tissues, leading to bleeding or oedema of the tissues. Therefore, a tracheal tube should be advanced over a fiberscope with great caution, particularly in patients with pathological changes to the glottis or surrounding tissues (Asai, 2004)

Based on several studies conducted, some measures are recommended in case of a difficult FOB guided nasal intubation; such as using a thick fiberscope and a thin tracheal tube, like the one with an internal diameter of 6.0 mm and the use of a flexible tracheal tube. Before attempting intubation, the tube should be loaded over the fiberscope to prevent any inadvertent damage to the Murphy eye of the tube. A laryngeal mask airway or an intubating laryngeal mask airway may be inserted to facilitate fiber optic intubation. Once the FOB is inserted into the trachea, any airway intubator already inserted should be removed. If there is difficulty in advancing the tube, withdraw the tube for a few centimeters, rotate it 90° anticlockwise, and re-advance it. While advancing the tube, the view through the fiber scope should be continuously monitored, either by a second person or by viewing it on a video screen. If it is still difficult to advance the tube, it may be rotated by 180°, the position of the head and neck adjusted, jaw thrust released, cricoid pressure applied; or a laryngoscope may be inserted before another attempt at intubation is made. If it is still difficult, further attempts should be avoided. Other options, including considering a surgical airway access, avoidance of tracheal intubation or cancellation of surgery should be considered.

In our case, the patient was an elderly male with an unanticipated difficult airway on examination and the procedure was an emergency DSA at odd hours with limited help. Since the patient had a good mouth opening and adequate neck movement, the primary plan was to do a routine induction and video laryngoscope assisted intubation. But when the intubation became unsuccessful even with assisted devices and manoeuvres, oral and nasal fiber optic guided intubation was attempted with tongue traction which also failed. Hence, considering the hemodynamic instability, procedure was done with a proseal LMA. However, for postoperative elective mechanical ventilation proseal LMA would not have been a definitive airway device. So securing the airway with an ETT was a necessity. Plan was now made for a known difficult intubation with possible mask ventilation and we kept the difficult airway cart including the cricothyrotomy set ready. We also kept a surgical backup in case of need of an emergency tracheostomy.

Plan A was inserting a fiber optic bronchoscope through the LMA and visualise the larynx, if possible, then thread a small size no 5 ETT through the LMA. Plan B was to change the LMA from proseal to Igel which has a wider diameter for a scope and ETT no 7.5 can be passed through. Since the negotiation of FOB through the LMA to trachea was not possible, Plan B was not attempted.

Plan C was to remove the LMA and do laryngoscopy with CMAC video laryngoscope, deviate the tongue and elevate the epiglottis, followed by guiding the nasal fiber optic scope loaded with a north pole tube under CMAC vision below the epiglottis and elevate it by the ante flexion of the bronchoscope tip. Along with appropriate pressures and adjusting the head and neck positions, negotiate the fiber optic scope into the glottis and rail road a north pole tube. Plan D was surgical airway intervention with tracheostomy.

Plan C was successful and patient was hemodynamically stable post intubation. An intubating LMA (LMA Fast-trac) would have been possibly useful in such a case, but was not available during the odd working hours. Post procedure we explained the relatives regarding the difficulties faced during the intubation and issued a difficult intubation card for future vigilance.

CONCLUSION

In elderly population, the chances of unanticipated difficult airway are high. Decrease in head and neck movement, thyromental distance, interincisor gap, poorer dental condition and cervical joint rigidity contributes to difficult airway in elderly patients. Proper airway assessment preoperatively and adequate preparations to manage difficult airway should be done in all patients as failure to secure a patent airway can lead to fatal outcomes.

Conflicts Of Interest: Nil

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