



Inadvertent Pneumothorax Caused by Intubating Bougie and Its Timely Management

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ABSTRACT

Adjuvant devices such as bougies and stylets are very useful and are a part of every difficult intubation cart. They are not only used during difficult intubation but also a modality to exchange endotracheal tubes in the ICU. Despite their popularity, they do have certain disadvantages. Here we present a case of pneumothorax that was caused by an intubating bougie which was however identified and the timely intervention of the same lead to an uneventful recovery by the patient.

Keywords: Pneumothorax, intubating bougie, difficult airway, fiberoptic bronchoscopy, intra-operative hypoxia

INTRODUCTION

Pneumothorax is a cause of intraoperative hypoxia that can worsen with positive pressure ventilation and timely intervention is very crucial in the management of this complication. A case of long standing thyroid can lead to tracheomalacia which makes the trachea prone for injury from even a minimal trauma. Hence any case of a long-standing thyroid should always alert the anaesthesiologist to anticipate difficult airway and its complications.

CASE REPORT

Mrs Mahbool, 55 years female, weighing 70kg came with complaints of swelling in the front of the neck for the past 3 years. There was no history of dyspnoea, dysphagia or hoarseness of voice. Patient is a known case of systemic hypertension on Tablet Amlodipine 2.5mg 2BD for the 5 years. Patient was diagnosed to have solitary nodular goitre and planned for hemithyroidectomy. There is a history of failed intubation following which the procedure was deferred in a private hospital 1 week ago.

Investigations including complete blood count, renal function tests, serum electrolytes, blood sugar levels, thyroid function tests and electrocardiograph was normal. Chest x-ray PA was normal. X-ray neck showed deviation of the trachea to the right. However, there was no compression. On examination, patient was conscious, oriented. No pallor, cyanosis or jaundice. No clubbing, pedal oedema or generalised lymphadenopathy. Body mass index was 27.3 and airway examination revealed a modified Mallampatti grade of 3. Mouth opening was 2 fingers and neck movements were restricted. Trachea was deviated to right. Patient assessed under ASA PS II.

Patient was premedicated with tablet diazepam 10 mg and tablet ranitidine 150mg the night before and patient was asked to fast overnight. On the day of surgery difficult intubation cart was kept ready. They included 2 working laryngoscopes, size 3 and 4 Macintosh blades, size 4 McCoy blade, bougie, supraglottic airway devices, suction apparatus and tracheostomy set.

After the patient was wheeled into the theatre, the pre-induction monitors such as pulse oximetry, non-invasive blood pressure monitoring and electrocardiogram were connected. Patient was then premedicated with Injection Midazolam 1mg iv, Injection Glycopyrrolate 0.2mg iv and Injection Fentanyl 100 µg iv. Following this preoxygenation was done for 3 minutes. Induction was done with Injection Propofol 100mg iv and Injection Xylocard 60mg iv. After ensuring that mask ventilation was possible, Injection Succinylcholine 100mg iv was given. Direct laryngoscopy revealed a view of Cormack Lehane Grade 2b. Intubation was done with a size 7.5mm cuffed flexometallic endotracheal tube with the help of a bougie and fixed at 20cm and connected to Bain's circuit. Initially auscultation revealed bilateral air entry that was equal on both sides. However, after 5 minutes the air entry was decreased on the right side. Intraoperatively the vitals were stable but the saturation was at 94-95%.

On suspecting bronchospasm, Injection Hydrocortisone 100mg iv and Injection Deriphylline 1 ampoule given intravenously. After adequate spontaneous respiratory efforts, patient was reversed with Injection Neostigmine 2.5mg iv and Injection Glycopyrrolate 0.4mg iv. After thorough suctioning, patient was extubated. Post extubation, patient was conscious and oriented but air entry decreased in right hemithorax.

Patient complained of breathing difficulty. Vitals were Pulse rate – 102/min, Blood Pressure – 150/100mmHg, Respiratory Rate – 26/min, SpO₂ – 86% in room air and 92% with O₂ by face mask. Budecort nebulisation given and diagnostic fibreoptic bronchoscopy planned. Both the nostrils were packed with gauzes soaked with Lignocaine with Adrenaline. Fibreoptic bronchoscopy revealed a mucous plug in the right main bronchus. Saline wash was given. There was a minimal improvement in saturation. A fullness was noted in the right hemithorax that was hyper-resonant on percussion. Immediately chest x-ray was taken which showed right pneumothorax.

Figure 1 Right Pneumothorax

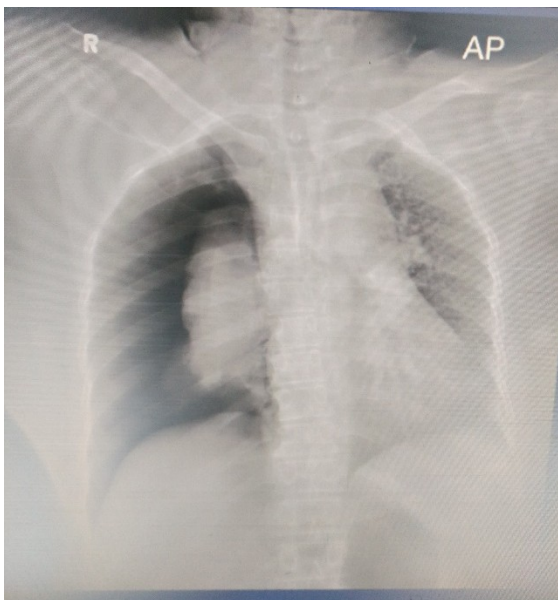


Figure 2 After Intercostal Drain Insertion



Right Intercostal Drainage was done and patient was shifted to Post Anaesthesia Care Unit for further monitoring. Postoperative period was uneventful. Intercostal drain was removed on 4th postoperative day after good lung expansion. Patient was discharged on 5th postoperative day.

DISCUSSION

Pneumothorax is an important cause of intraoperative hypoxia. Pneumothorax is the presence of air in the pleural space. The types include closed, open and tension pneumothorax. Pneumothorax is characterised by increased airway pressures, tachycardia, hypotension, decreased breath sounds on the affected side with a fullness that is hyper-resonant on percussion. There may be associated tracheal deviation but it is a late sign and jugular venous pressure can be elevated. Chest X-ray findings are increased radiolucency, absence of broncho-vascular markings, lung collapse with tracheal or mediastinal shift and diaphragmatic depression. Deep Sulcus sign describes the presence of deep costophrenic angle on supine film. In the management intraoperative hypoxia, the first step is to increase the FiO₂ to 100%. Patient should be hand ventilated and the monitors are checked followed by auscultation for bilateral air entry. A situation of adequate ventilation with hypoxia and the presence of wheeze suggests bronchospasm and

pneumothorax. Once the diagnosis of pneumothorax is made needle decompression can be made at 2nd ICS by wide bore needle and insertion of intercostal drain at 4th intercostal space at midaxillary line is done.

CONCLUSION

In a case of a long standing large thyroid mass, anticipation of difficult airway, preoperative assessment and being well equipped to handle any complications are highly crucial in the management of the case. A well planned primary plan of management and an alternative plan of management should be ready. Further the presence of a difficult airway cart cannot be emphasised enough for this case. Although pneumothorax is a rare complication, it can be diagnosed by meticulous examination and by ruling out other causes of intraoperative hypoxia. This case was managed effectively by the timely diagnosis and intervention.

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