CASE REPORT

Pneumothorax caused by difficult intubation in maxillofacial surgery patient with restricted mouth opening

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Abstract

Orofacial pathologies conjoined with restricted mouth opening are challenging due to difficulties in intubation. The aim of this case report is to present a case who developed pneumothorax related with general anesthesia caused by difficult intubation and discuss the reasons of this fatal complication. A 54-year-old male patient who presented with pathological fracture of the mandible secondary to osteoradionecrosis was planned for surgical treatment under general anesthesia. Following several attempts of intubation, tracheostomy was performed to secure airway. The patient has developed pneumothorax at post-anesthesia recovery. Severe trismus is a complicating factor for both anesthesia and surgery as positive pressure that is applied during intubation attempts may trigger pneumothorax.

Keywords: Difficult intubation, mandibular fracture, osteoradionecrosis, pathological fracture, pneumothorax

Introduction

Airway management in maxillofacial surgeries, especially in patients with reduced interincisor distance, remains a challenge for both anesthesia and surgery. There are few papers that study challenges of anesthetic procedures and intubation difficulties of dental patients. [1] Head-and-neck irradiation-related fibrosis and temporomandibular joint ankylosis are predominant reasons for restricted mouth opening which cause difficult intubation. [2,3] The difficult airway resulting from head-and-neck pathology is a significant cause of deaths during general anesthesia. [4]

The aim of this case report is to present a fatal complication like pneumothorax caused by difficult intubation due to restricted mouth opening. We focused on the reason of pneumothorax following a difficult intubation and general anesthesia.

A Case Report

A 54-year-old male patient with pathologic mandibular fracture secondary to osteoradionecrosis which was already under our follow-up for his osteoradionecrosis was planned for surgical treatment [Figure 1].

Intubation for fracture surgery was predicted to be difficult due to severe trismus. Limited mouth opening was caused by irradiation therapy to head-and-neck region [Figure 2].

The patient was American Society of Anesthesiologists (ASA) III due to systemic conditions related with cardiac problems and diabetes. Informed consents for both anesthetic procedures including tracheostomy permission and surgical procedures were obtained from patient. General anesthesia was inducted with propofol following routine monitoring of patient in the operation theater. The patients’ airway could not be secured with even fiber optic after several attempts of intubation. Then, tracheostomy has been performed for intubation. The patients was ventilated during operation. As there was no expectation for normal union of fracture line, osteoradionecrotic bone was excised until normal bleeding bone was encountered. The segmental defect was bridged with reconstruction plate. Further, reconstructive surgeries were cancelled to avoid extending operation period. Considering the risk of perioperative complications and unsuitable systemic conditions of our patient, we have performed conservative surgical options for palliation. Surgical reconstruction was performed transcervically.

The patient had pneumothorax related with his bullous emphysema at post-anesthesia recovery [Figure 3]. Although cardiopulmonary resuscitation and chest tube placement were performed, the patient had been exitus. The patient who had...
Fiber-optic bronchoscopes have contributed to a large extent to the management of difficult airway.\cite{5}

Berg et al. investigated pneumothorax following tracheal intubation and suggested that pneumothorax occurring clinically is more likely a complication of assisted ventilation than a complication of tracheotomy. High positive pressures during mechanical ventilation led to pneumothorax and pneumomediastinum, due to rupture of perivascular alveoli or a subpleural bleb or cyst.\cite{6} Case reports of acute pneumothorax are reported following an uneventful general anesthesia for elective cholecystectomy and tracheal dilation.\cite{7,8} The main cause of the pneumothorax was believed to be rupturing of pulmonary alveoli or bullae as in our case by both increased pressure and high tidal volume.\cite{7,9} Our case report emphasizes this rare but serious complication due to positive airway pressure, especially during intubation attempts.

Nunn et al. reported a case of bilateral tension pneumothoraces complication due to barotrauma. Lung volumes and inflation pressures must be limited; short insufflation bursts are recommended. To prevent auto-positive end-expiratory pressure, complete exhalation needs to occur before the next insufflation cycle.\cite{10}

**Conclusion**

Trismus is an indication for keeping all emergency airway devices and stand-by tracheotomy. Pneumothorax, especially in difficult intubations, is an unexpected complication at post-anesthesia recovery.

**Acknowledgment**

This case was presented as poster presentation in British Association of Oral Maxillofacial Surgeons International Conference with the title of “Management and complications of
pathologic fractures of mandible secondary to osteoradionecrosis, bisphosphonate osteonecrosis, and osteomyelitis.”

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