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Endotracheal Intubation Related Massive Subcutaneous Emphysema and Tension Pneumomediastinum Resulting in Cardiac Arrest

Sir,

Tracheal injuries account for 15% of all airway injuries and in majority of the cases involve routine tracheal intubation and appropriate anaesthesia care. The authors would like to describe a patient who developed subcutaneous emphysema and tension pneumomediastinum related to multiple intubation attempts resulting in cardiac arrest.

A 42-year-old man underwent left hemimandiblectomy and radical neck dissection. Difficult intubation was anticipated as the mouth opening was 2 fingers, Mallampati grade II airway and tumour was bulging inside the oral cavity. After confirming adequacy of bag mask ventilation, muscle relaxant was given. Laryngoscopy revealed a Cormack and Lehane grade 3 glottic view and orotracheal intubation was achieved at the second attempt after using a stylet and applying external laryngeal pressure and a gentle pull on the angle of the mouth. The surgery later necessitated a change to nasal tube which required two more attempts. No air leak or loss of ventilation was observed during the IPPV. The subsequent course of anaesthesia and surgery was uneventful.

The patient was shifted to ICU for elective ventilation in view of the surgical oedema. He developed bouts of coughing on the tube when a T piece weaning trial was given with a partially deflated cuff next morning. Within 10 minutes, the oxygen saturation decreased to 80% and a swelling with palpable crepitus appeared over the face, neck, chest and upper extremities. The patient became cyanosed and developed cardiac arrest, which was treated, and a normal sinus rhythm was restored.

An x-ray chest revealed the presence of air in the subcuta-
neous tissue planes of the neck and axilla with a pneumome-
diastinum. A surgical tracheostomy was done to decompress
the mediastinum and resulted in significant haemodynamic
improvement. A subsequent fibreoptic bronchoscopy revealed
a 2 cm red streak beyond the larynx, but the area beyond the
tracheostomy was normal. CT scan of the head - neck showed
air pockets in the pyriform fossa but the pneumomediastinum
had disappeared. The patient was treated conservatively and
discharged from the hospital after 20 days.

Acute subcutaneous emphysema and pneumomediastinum are
rare complications related to endotracheal intubation, and
are potentially fatal if left untreated. Poor visualisation of the
larynx, repeated attempts at blind advancement of endotra-
cheal tube and use of stylets are significant risk factors for in-
tubation related airway trauma. We feel that repeated intuba-
tion attempts may have created a raw area on the posterior
tracheal wall and straining on the tube during weaning may
have resulted in a high intrathoracic pressure and disruption
of the injured site. Subsequent high negative intrathoracic pres-
sure generated might have entrained air along the sides of the
tube through the tracheal rent into the subcutaneous tissue
causing subcutaneous emphysema and tension pneumome-
diastinum.

The development of cardiac arrest and improvement fol-
lowing tracheostomy confirm our diagnosis of tension pneu-
omediastinum. Tracheostomy allows for mediastinal decom-
pression by providing a route for accumulated gases to es-
cape to the atmosphere and thus hasten the process of resolu-
tion. A planned fibreoptic bronchoscopy guided nasotracheal
intubation might have avoided significant morbidity in this
patient.

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