

Post adenotonsillectomy pneumomediastinum and subcutaneous emphysema: A rare complication of a common procedure.

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ABSTRACT

Cervicofacial and pneumomediastinum subcutaneous emphysema is a very rare complication of adenotonsillectomy procedure. Even though it is a self limiting complication and can be treated conservatively, it can be alarming for the patient or patient's family as well as leading to more serious and fatal consequences occurring from tension pneumomediastinum. We report a case of incidental finding of pneumomediastinum in postadenotonsillectomy patient. He was managed conservatively and made an uneventful recovery.

Keywords: tonsillectomy, subcutaneous emphysema, complication

INTRODUCTION

Adenotonsillectomy is a common surgical procedure among paediatric age group. It is relatively a safe procedure with minimal complications. Common complications are intraoperative or postoperative haemorrhage, infection, damaged to soft tissue and surrounding structure such as teeth, odynophagia and oropharyngeal edema.¹ Cervicofacial and pneumomediastinum subcutaneous emphysema is a very rare complication. We presented a case of pneumomediastinum subcutaneous emphysema following adenotonsillectomy in Malaysia.

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Case Report

A 12 year old boy was admitted to our Ear, Nose and Throat (ENT) ward for elective surgery of adenotonsillectomy. The indication for surgery was recurrent attacks of acute tonsillitis. He had underlying Allergic Rhinitis and Bronchial Asthma.

Patient was given general anaesthesia with fentanyl, propofol and cisatracurium during induction. He was intubated with endotracheal tube, REA size 7mm without any difficulty by anaesthesiology team. Intraoperative findings was fibrotic bilateral tonsils (grade 3) and 50% adenoid hypertrophy. Both tonsils were separated from tonsillar bed using cold instrument dissection technique and inferior pole was released using tonsillar snare. Adenoid was removed using conventional adenoid

curettage technique. Haemostasis then was secured with bipolar diathermy.

Within 12 hours post surgery, patient developed fever at 38 degree Celcius. There were neither upper respiratory tract symptoms such as cough nor active hemorrhage. On day 2 post surgery, patient recovered from fever and was discharged well. However, about 12 hours after discharge, patient was brought to Accident and Emergency Department by his mother, who noted the presence of crepitus over the neck region of her son. He has no obvious neck swelling, difficulty in breathing, chest pain, odynophagia or dysphagia.

Examination by the attending ENT medical officer revealed generalized subcutaneous crepitus all around the neck from the jaw till upper chest region. The tonsillar fossae were covered with slough, there was no blood clot or active bleeding. He was afebrile and all vital signs were stable. Flexible nasendoscopy was performed to ensure that the airway was not compromised and was found to be normal.

Soft tissue neck radiograph showed extensive subcutaneous emphysema in the neck and both supraclavicular regions with presence of pneumomediastinum. There was no pneumothorax seen. (Fig 1, 2). Patient was admitted to intensive care unit (ICU) for close observation. He was put on high flow mask oxygen and started on intravenous antibiotic. Since patient did not have odynophagia or dysphagia, he was allowed to take oral diet with intravenous fluid as maintenance. After 3 days of ICU monitoring, the crepitus around the neck has resolved and repeated soft tissue neck radiograph confirmed resolution of the pneumomediastinum and subcutaneous surgical emphysema. He was once again discharged home in a well condition.

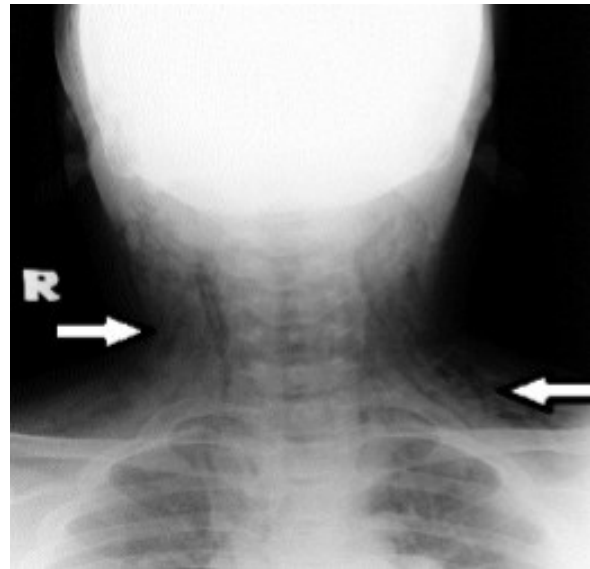


Figure 1: Post-operative day 2 AP view of soft tissue neck radiograph. Arrows show bilateral supraclavicular subcutaneous emphysema.

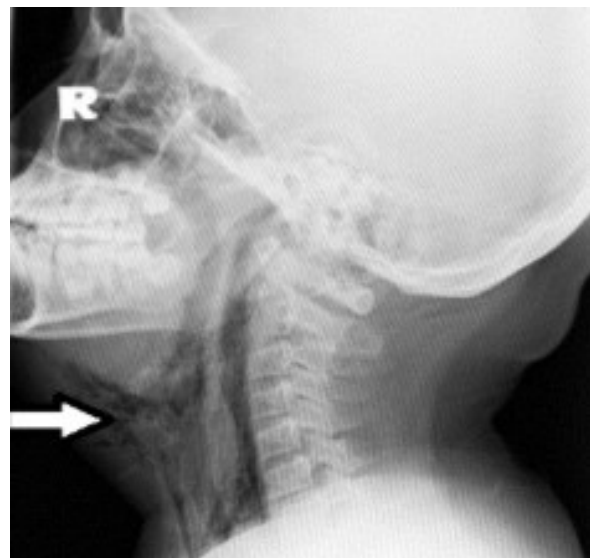


Figure 2: Post-operative day 2 Lateral view of soft tissue neck radiograph. Arrows show extensive cervical subcutaneous emphysema .

Discussion

Adenotonsillectomy is a safe surgery with minimal complications.¹ A retrospective case-controlled study done by James Belyea et al in 2013 found that out of 127 children under 3 years old who underwent adenotonsillectomy, the early complications were respiratory related such as bronchospasms and pulmonary oedema (3.1%) and the late complications were due to dehydration and haemorrhage (6.3%)

which required readmission of patient.² The other possible complications are infection, teeth damage, pharyngeal oedema and odynophagia.¹ However, a cervicofascial or pneumomediastinum subcutaneous emphysema is a very rare complication.

Our patient was well preoperatively and the intubation as well as extubation procedure was uneventful. Post operatively, patient developed reactive fever due to inflammatory reaction.³ As the fever developed within 12 hours without symptoms of upper respiratory tract infection (URTI), or active bleeding, thus no antibiotic was started. At home, he has no fever, tolerating orally well and no URTI symptoms. He did not complaint of neck pain or odynophagia.

Normally patient with subcutaneous emphysema post adenotonsillectomy will present with neck swelling, pain, difficulty of breathing, dysphagia or odynophagia as reported in other literature review.^{1,4,5,6} However, in this case, the patient did not experience the above symptoms possibly due to early detection of subcutaneous crepitus by his mother who is a paramedic. He also did not give a history of straining, performing valsalva manoeuvre or coughing prior to the event.

The exact pathophysiology of subcutaneous emphysema post adenotonsillectomy surgery is not well understood but it has been postulated that, it could be due to breach of the tonsillar fossa bed during the surgery. This will lead to air escaping into the parapharyngeal and retropharyngeal spaces and subsequently into the subcutaneous tissue of the mediastinum. This condition may be precipitated by coughing or vomiting during extubation.^{1,4,5} Apart from that, excessive positive pressure ventilation may worsen the condition by causing the ventilated gas to spread subcutaneously.¹

As in our case, vigorous dissection of the tonsillar bed in case of fibrotic tonsil or adhesion may lead to breach of the tonsillar fossa bed which could be the only possible explanation for the resulting pneumomediastinum and cervical subcutaneous emphysema. Small or minor mucosal breach may not be apparent, thus easily missed intraoperatively. Ideally if it is noted intraoperatively, repair of the breach mucosa should be done in the same operative setting to prevent subcutaneous surgical emphysema from developing as a post-operative complication. Apart from the surgical procedure itself, trauma due to intubation may also cause breach to the oropharyngeal mucosa and subsequent surgical emphysema.

Cervicofacial or pneumomediastinum emphysema is usually a self limiting and can be treated conservatively. Usually it will resolved spontaneously after several days.⁹ For non serious and stable cases such as our case, it can be treated conservatively, supplemental oxygen may facilitate nitrogen absorption from emphysematous air and hastened the recovery. Patient should be advice to avoid straining or doing valsalva manoeuvre. Coughing or vomiting should be treated respectively with antitussive or antiemetics. Intravenous antibiotic should be started to prevent infection. If there is any evidence of mucosa tear during endoscopic examination, patient should be taken back for surgical repair of the torn mucosal.

In severe cases of undetected pneumomediastinum, the increasing pressure may potentially lead to tension and cardiopulmonary collapsed can occur. In a literature review of cervicofacial subcutaneous emphysema, Al Jabr et al reported 14 cases, four of which required aggressive surgical management such as tracheostomy in 2 patients, thoracotomy in another and one patient required intubation and ventilation.¹

In conclusion, although rare, risk of cervicofacial and pneumomediastinum subcutaneous emphysema should be explained to patient and parents during preoperative counselling. Even though it is a self-limiting complication, if detected, patients should be closely monitored for more serious complication of tension pneumomediastinum or mediastinal infection. Intraoperatively, precaution should be taken in cases of fibrotic tonsils to avoid excessive dissection which can lead to breach of the tonsillar fossa bed and thus subsequently development of subcutaneous emphysema. Anticipated difficult adenotonsillectomy cases should be performed with supervision from senior surgeons and patient should be kept at least 48 hours post operatively to observe for rare complication such in this case.

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