

## SURGICAL EMPHYSEMA AFTER TONSILLECTOMY

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### Abstract

Surgical emphysema is the presence of free air within the soft tissues which occurs following trauma or as a complication of many surgical procedures in upper aerodigestive tract. But surgical emphysema after tonsillectomy or adenotonsillectomy is very rare indeed. Most of the cases are benign and self limiting but severe life threatening situations may arise. This communication reports 4 more cases with a review of literature and discussion on its pathogenesis and management.

### Introduction

Tonsillectomy is the commonest ENT operation throughout the world. In spite of gradual decline in the number still it accounts for 20% of all operations performed by ENT surgeons<sup>1</sup>. More than 90% tonsillectomies are done for Recurrent Tonsillitis. The common complications of tonsillectomy are haemorrhage, local sepsis, injury to other structures and complications of anaesthesia. Only rarely tonsillectomy is complicated by surgical emphysema<sup>2,3,4</sup>. Review of available literature revealed the earliest case report dated back in 19105. Since then it is reported from different centers time to time. Four more cases are added to this list from this report. Most authors reporting surgical emphysema after tonsillectomy suspected the air entered through the tonsillar bed. Although most cases resolve without complication, it is a potentially life threatening clinical entity<sup>6</sup>. This paper illustrates the salient clinical presentation and management of this unusual and rare complication of tonsillar surgery.

### Case 1

A lady of 45 years (CMCH Regn. No 9967/33) underwent tonsillectomy by dissection method under general anaesthesia for recurrent attacks of acute tonsillitis on May 27, 1997 Left tonsillar fossa showed much fibrosis for which the operation took longer time than usual. Haemostasis was also difficult on the left side. She had a difficult recovery too.

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Excessive coughing and straining continued for some time. Two hours after operation her face and neck showed gross swelling. Palpation revealed crepitus. Then she became restless and started complaining of neck and chest pain. She was then transferred to the intensive care unit (ICU). ECG and X-ray chest were done and found to be normal. X-ray soft tissue neck showed air translucency in the tissue space. She was put on parenteral antibiotic, analgesic and sedatives. She later showed gradual improvement. She was allowed to go home after one week. After 18 months follow up she was well and without any symptom.

### Case 2

A boy of 5 years (DMCH Regn. No 63/5) underwent adenoidectomy and tonsillectomy by dissection method under general anaesthesia on February 21, 2001 Proper haemostasis was achieved at all the sites. After recovery from anaesthesia he became too much restless. He was given Inj. Diazepam 5mg IV to calm him down along with Diclofenac suppository 12.5mg. He was under IV antibiotic coverage with Inj. Ampicillin 125mg and Inj. Cloxacillin 125mg 6 hourly. He became violent again in the evening and a repeat dose of Inj. Diazepam 5mg IV was given. Later he was found to have surgical emphysema on the left side of upper neck, left half of face and left eye lids. His pulse, respiration and temperature was within normal limit. He was under close monitoring for the physical signs. Subsequently he had a good night sleep with out any further increase in the surgical emphysema or restlessness. Within the next 3 days his surgical emphysema resolved completely. On the 4<sup>th</sup> post operative day he was discharged from hospital. After 2 weeks of operation his tonsillar fossae were healed.

### Case 3

A lady of 50 years underwent tonsillectomy and avulsion of both styloid processes under general anaesthesia on June 29, 2006. The operative and immediate post operative period was uneventful. About 8 hours later she showed subcutaneous emphysema at the head-neck region more marked on left side (Fig-I). She was put on IV fluid and antibiotics and Diclofenac suppository for first 24 hours. Then she was put on oral antibiotics, analgesic and antiseptic mouth wash.

All her parameters were within normal range. She went home after 2 days. At 4 months she was perfectly well.



Fig-1: Emphysema at the head-neck region on leftside

#### Case 4

A 22 years old male patient underwent interval tonsillectomy by dissection method after second attack of left Peritonsillar abscess in 6 months time. During surgery Rt tonsil was dissected out easily but on Lt side it was densely fibrosed and adherent with underlying muscle layer. During dissection the muscle fibres were torn and repaired with catgut. Haemostasis was ensured with diathermy and ligatures. Recovery from anaesthesia was smooth and uneventful. He was on oral antibiotic and analgesic. On the same afternoon patient complains of neck swelling on Lt side and irritant cough. The swelling tends to increase on bouts of coughing. On examination surgical emphysema was noted extending from level of Mandible to the supraclavicular fossa. The patient was reassured about the incident and antihistamine was added to suppress cough. Periodic follow up was done. The surgical emphysema did not extend further after the day of operation and he was discharged on the 4<sup>th</sup> post operative day. The surgical emphysema resolved completely within 8 days after surgery. He was perfectly alright in follow up 1 month after surgery.

#### Discussion

Surgical emphysema is a complication of a variety of surgical procedures performed in the upper aerodigestive tract. But in tonsillar surgery it is a rare event. Tonsillectomy is the commonest operation done by the ENT surgeons. Though there are several methods of tonsillectomy, dissection method is the most widely practised among all. Dissection causes breach of pharyngeal mucosa but that does not account for subsequent surgical

emphysema. To develop emphysema air must find its way through the pharyngeal musculature into the subcutaneous tissue planes<sup>7</sup>.

Recurrent attacks of acute tonsillitis or Peritonsillar abscess lead to excessive fibrosis at the tonsillar bed which makes the procedure difficult. In such circumstances dissection may tear the pharyngeal muscle and opens an avenue for air entry into subcutaneous tissue planes. Pharyngeal musculature may act as gate valve to allow unidirectional air entry into the tissue plane till fibrin deposit and slough formation appears to seal the leakage. The chance of tearing pharyngeal musculature in dissection method is more but there are reports of cases in newer method like electrocauterization and argon beam laser where tissue damage is very minimal<sup>8</sup>. Excessive coughing, straining, vomiting, convulsion and restlessness at recovery might have added to it. Manual ventilation after extubation or Valsalva maneuver in immediate post operative period can increase the intrapharyngeal pressure and raises the possibility of developing emphysema<sup>6</sup>. Occasionally a laceration in the posterior pharyngeal wall secondary to intubation or Boyle Davis mouth gag may be the cause<sup>7</sup>. Air can be forced into the fascial planes of the neck and along the trachea into the mediastinum. In pneumomediastinum gas can escape into the abdominal cavity through diaphragmatic apertures and cause pneumoperitoneum<sup>7</sup>. In the literature there are sporadic case reports of surgical emphysema developed after dental surgery and temporomandibular joint surgery<sup>6</sup>. In such situations subcutaneous emphysema is to be differentiated from haemorrhage, allergic reactions and angioneurotic oedema. Careful palpation is likely to elicit crepitus in subcutaneous emphysemas against above other conditions of rapid onset. X-ray soft tissue neck may be done to confirm it. A chest X-ray should always be obtained in these cases as Pneumothorax would suggest a deeper origin rather than a break in pharyngeal wall<sup>7</sup>. Most cases of surgical emphysema are benign and self limiting, however severe life threatening sequelae are possible. These include tracheal compression, pneumopericardium, impaired venous return and fatal hypotension<sup>9</sup>.

General management in such situation requires frequent careful assessment of the extent of the subcutaneous emphysema and the airway. It is possible that organisms from oropharyngeal area

may migrate through the muscular breach and therefore broad spectrum antibiotic should be used. Pneumothorax and pneumomediastinum need exclusion. Monitoring of cardio-respiratory function requires ECG and oxygen saturation monitoring. Supplemental oxygen may facilitate resorption of nitrogen down a favorable concentration gradient, thus hastening recovery<sup>6</sup>. Intravenous fluids may be required where Odynophagia is significant. Patient should refrain from strenuous exertion, coughing and straining until resolution. Very rarely patients need surgical measure like Thoracotomy to relieve trapped air<sup>5</sup>. Careful dissection in tonsillar fossa to avoid pharyngeal muscular damage may help to avoid such complication.

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