Surgical Emphysema – An unusual complication of Balloon Eustachian Tuboplasty

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Balloon dilatation of the Eustachian Tube has gained popularity in recent years as a safe, minimally invasive technique for treating chronic obstructive dysfunction of the Eustachian Tube. We present a case of surgical emphysema of the neck and mediastinum after an uncomplicated balloon Eustachian tuboplasty.

Case Report

37 year old gentleman underwent balloon Eustachian tuboplasty under general anaesthesia for chronic obstructive dysfunction of the Eustachian tube. The anaesthetic and procedure was uncomplicated and he was discharged home the same day. Post-operative instructions were to avoid Valsalva manoeuvres and strenuous exercise.

Day 4 post-operatively he was readmitted by ambulance into the resuscitation room with gross swelling of the neck bilaterally extending to the anterior chest. There was no airway compromise. This has occurred suddenly and painlessly after running up a flight of stairs. He had been frequently 'popping' his ears as was his usual technique to deal with ear discomfort. Palpation revealed extensive crepitus of bilateral necks and anterior chest to the level of the xiphisternum. Flexible nasoendoscopy showed no airway compromise. Vital signs remained within expected parameters.

Imaging

Chest X-ray was unremarkable. CT scanning of the neck and chest revealed extensive surgical emphysema throughout the anterior and deep neck spaces with extension into the mediastinum down to the subcarinal level. There was no vascular or endobronchial compression and no pneumothorax.

The site of the mucosal breach could not be definitively identified on CT scanning however was suspected to be a mucosal breach of the cartilaginous right Eustachian tube (see image above). After 48 hours of clinical observation with prophylactic antibiotics repeat CT scanning was performed which showed partial resolution of free air. He was discharged without issue after 3 days of observation. At 3 month review he remained well with complete resolution of his Eustachian tube symptoms.

Complications of Balloon Eustachian Tuboplasty (BET)

The Eustachian Tube is approximately 35mm in length and 3mm in diameter with a bony lateral and cartilaginous medial part.⁽¹⁾ The cartilaginous medial end is instrumented during the procedure. The assumed mechanism of injury is microperforation during the procedure. Some authors have postulated that patients with chronic obstructive dysfunction of the Eustachian tube may have congenitally narrower Eustachian tubes and therefore may be at higher risk of microperforation during dilatation.⁽²⁾ It is impossible to say in how many cases this occurs as microperforations heal rapidly. However if a Valsalva manoeuvre is performed post-operatively this would be sufficient to force air through these perforations into the surrounding potential spaces in the neck and mediastinum, as in our case.

In the largest study of BET in the literature, a review of over 3500 procedures, 10 cases of cervicofacial emphysema were seen with 3 extending to the mediastinum. None of these patients had an adverse clinical outcome in the long-term.⁽³⁾ Surgeons performing this procedure need to be aware that, although rare, BET carries a potentially life threatening post-operative complication and must ensure that patients are counselled appropriately. Of paramount importance are clear post-operative instructions to avoid any activity that could produce the effect of a Valsalva manoeuvre and to seek medical attention should surgical emphysema occur. There is as yet no long term consensus on the clinical effectiveness of BET as an intervention for chronic obstructive dysfunction of the Eustachian tube.

References

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