Conservative Treatment of Delayed Tracheal Perforation Following Thyroidectomy

Abstract

Objectives: To report on a patient who underwent a total thyroidectomy and re-presented three weeks later with significant subcutaneous emphysema due to a tracheal perforation.

Case report: A 42 year old man underwent a thyroidectomy to remove a papillary carcinoma. He re-presented three weeks later with a fluctuant anterior neck swelling which was reducible and increased in size on raised intra-thoracic pressure. A lateral neck x-ray showed a large pocket of air and a subsequent CT scan showed a small defect in the anterior tracheal wall. This was visualised with a rigid bronchoscopy and found to be a pin-sized perforation. The patient was managed conservatively and the swelling resolved over a period of 2 to 3 weeks.

Conclusions: Delayed post thyroidectomy tracheal perforation is a very rare complication. In this case the patient had no respiratory compromise and so conservative management was seen to be the best management option.

Keywords
Tracheal perforation, thyroidectomy
the swelling. The swelling did however quickly re-accumulate, so a chest and a lateral soft tissue x-ray were performed. This clearly showed a significant sized subcutaneous pocket of air (Figure 1).

With this degree of subcutaneous emphysema, a provisional diagnosis of delayed tracheal perforation was thought to be the most likely cause. A CT scan was arranged to look at the area in greater detail and this confirmed the presence of a small defect in the anterior tracheal wall which allows communication of air between the trachea and the thyroid bed producing an area of subcutaneous tissue emphysema measuring 5.3x6.2x2.0 cm (Figure 2).

Having confirmed a tracheal perforation, a rigid bronchoscopy was deemed appropriate after a consultation with a thoracic surgeon in order to directly view the perforation and decide how best to manage it. The perforation was seen to be a tiny ‘pin-hole’ sized defect during bronchoscopy under general anaesthetic. It was then decided to treat the condition conservatively as the patient was not in any respiratory compromise.

The patient was reviewed one week later and he was found to be asymptomatic regarding the neck swelling, which only appeared if he were to cough or sneeze. Another review of the patient after a further two weeks showed that the swelling had completely resolved and the patient was now asymptomatic.

**Discussion**

Total thyroidectomy is a safe procedure with low complication rates. In experienced hands, it is thought that the overall rate of complication is around 5%. Common complications include hypoparathyroidism, recurrent laryngeal nerve injury, wound infection and wound haematoma. Tracheal injury is a much rarer event and can occur intra-operatively or develop up to a few weeks postoperatively. The rate of tracheal perforation was found to be 0.06% according to a study conducted by Gosnell et al. The study retrospectively examined thyroidectomy data for 45 years. The authors found that only 7 tracheal perforations occurred out of 11917 operations, all of which were identified and repaired intra-operatively. One of the cases was readmitted with subcutaneous emphysema and similarly to our case, was managed with conservative treatment alone.

A thorough search in the English language literature found only one similar case of delayed tracheal rupture. In this case the patient re-presented seven days postoperatively to the Emergency Department and was managed with intubation, CT scan and urgent wound exploration showing an anterior tracheal defect which was repaired surgically. In this case, a total thyroidectomy was performed for the treatment of Graves Disease with clinical thyrotoxicosis. As in our case the patient was being treated for papillary carcinoma, it was important to ensure complete thyroid tissue removal to prevent recurrence and this may have increased the risk of subsequent tracheal necrosis.

Delayed tracheal perforation is thought to be due to tracheal necrosis resulting from devascularisation of the tracheal wall by the possible use of diathermy at the time of surgery. Intra-operatively this can commonly occur in the posterior-lateral tracheal wall around the ligament of Berry, following diathermy, or as a result of suturing vessels in this area. It may be difficult to detect a small defect on visual inspection of the trachea and it is preferable for the wound to be instilled with saline before closure, to identify any air leaks. Should perforation be missed or occur after closure, the patient may present in the following days with subcutaneous emphysema, wound infection or respiratory compromise. Serious sequelae are tension pneumothorax and pneumomediastinum which will need urgent exclusion and intervention.

Management of such condition depends largely on the degree of respiratory distress the patient exhibits and is most likely proportional to the size of the defect and the severity of the subcutaneous emphysema. An urgent chest x-ray and/or a lateral neck soft tissue x-ray should be obtained to exclude pneumothorax and identify the swelling in the neck. A CT scan of the neck to identify the degree of subcutaneous emphysema and to assess the location and size of the perforation is helpful. It is
useful to perform a bronchoscopy to directly view the perforation and plan further management. At this point a decision can be made as to whether to re-explore the wound for surgical closure or whether conservative management is reasonable.

The urgency regarding taking the patient to the operating theatre will mainly depend on the clinical presentation. In our case, the patient remained stable and was taken to theatre the following day for rigid bronchoscopy at which point the perforation was seen to be small and so conservative management was indicated. This shows a different clinical picture when compared to the other reported case where the patient presented as an emergency. In this case the airway had to be secured, then operated on immediately where the wound had to be reopened and the defect repaired.

Tracheal perforation associated with thyroidectomy is rarely seen. But awareness of the potential for this complication to happen should not be forgotten. Our case demonstrates that conservative treatment is a successful management option for patients who are clinically stable.

Conflict of Interest
All authors have no conflict of interest to declare. No extraneous funding was obtained.

References