CASE REPORT

Potential life-threatening complication of tonsillectomy: cervicofacial surgical emphysema

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SUMMARY

A 30-year-old woman presented to the accident and emergency department 3 days post-tonsillectomy with bleeding from the tonsillar fossa and left-sided facial swelling. The patient denied any dysphagia or breathing difficulties but experienced pain on neck movement. On examination, although the bleeding had stopped on reaching the emergency department, a small clot was noted in her left tonsillar fossa. A left facial/submandibular swelling was seen, which had been present since her operation and was slowly enlarging. Flexible nasendoscopy showed a mild left sided oropharyngeal swelling but was otherwise normal. She was treated initially with antibiotics and hydrogen peroxide gargles. After 24 hours of observation and a slight worsening of the swelling she underwent a CT of the neck. This showed widespread indurated subcutaneous surgical emphysema, originating from the left tonsillar bed. Following a period of observation and improvement in her symptoms, she was discharged home with safety netting.

BACKGROUND

Tonsillectomy is a commonly performed operation. Its complication by 'cervicofacial surgical emphysema' is rare, but potentially life threatening. Although rare, clinicians should be aware of this complication for its appropriate and early management. Our patient was treated conservatively and did not deteriorate. We also discuss the probable causes of post-tonsillectomy cervicofacial surgical emphysema.

CASE PRESENTATION

A 30-year-old woman underwent a tonsillectomy for recurrent tonsillitis in a tertiary centre. During her operation, she was noted to have grade III fibrotic tonsils, and her left tonsillar bed had bled slightly more than expected. She presented to the accident and emergency department 3 days later with bleeding and small clots that had started overnight, and a left-sided facial swelling. Her bleeding had settled on admission, although she had severe throat pain and nausea. She had no relevant medical history, no regular medications or allergies but was a current smoker.

On examination, she had a large left submandibular swelling, which had been present immediately postoperatively and was described as enlarging. She denied any difficulty in breathing or swallowing. The swelling was diffusely tender, with no

fluctuance or firmness. Crepitus, however, was felt overlying the swelling. Aside from a small clot with no active bleeding in her left tonsillar fossa, her oral cavity appeared normal on examination. More specifically, there was no evidence of oral/dental infections. Her blood results were unremarkable, with a haemoglobin of 107g/L, a marginally raised white cell count of $11.2 \times 10^9/L$, and a C reactive protein of 26 mg/L.

She was commenced on oral co-amoxiclav to treat a possible secondary bacterial infection, and hydrogen peroxide gargles were used to clear the small clot from her left tonsillar fossa.

The following day, she had worsening pain on swallowing, and an increase in the facial swelling. Flexible nasendoscopy was performed, showing a mild swelling in the left oropharynx and a normal larynx. Her case was discussed with the on-call consultant who recommended CT imaging.

INVESTIGATIONS

A CT scan of the neck with contrast was performed, which showed the left side of the face and neck to be distended by widespread surgical emphysema (figure 1). This originated in the left tonsillar bed and tracked into the deep and superficial spaces along the pterygoid muscles (figure 2). No additional collection or haematoma was identified. The left submandibular gland was slightly enlarged,

Figure 1 Axial CT scan showing facial swelling and surgical emphysema.

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Figure 2 Axial CT scan showing deep extent of surgical emphysema and its communication with the tonsillar fossa.

most likely representing inflammatory changes associated with sialadenitis. Her airway was slightly displaced to the right but remained patent.

DIFFERENTIAL DIAGNOSIS

Our differential diagnoses included haematoma (static or expanding), and a postoperative collection. After CT imaging, it was clear that she had developed surgical emphysema postoperatively.

TREATMENT

The patient was treated conservatively, with only the aforementioned prophylactic antibiotics, hydrogen peroxide gargles, and analgesia. Hydrogen peroxide gargles, however, were stopped once the diagnosis of cervicofacial surgical emphysema was made, in case of worsening.

OUTCOME AND FOLLOW-UP

Her symptoms improved the following day, and she was discharged home to complete a 7-day course of oral co-amoxiclav. Safety netting was put in place and she was counselled that her swelling should decrease in size with time, and that no follow-up would be required.

DISCUSSION

Tonsillectomy is one of the most common ENT surgical procedures. It is typically performed in adults for recurrent infections and/or complications such as peritonsillar abscesses. While very safe, it does have a number of risks, including postoperative haemorrhage, infection, pain and dental damage. Facial subcutaneous emphysema is a rare, but potentially life-threatening risk, which is estimated to occur in <1% off all procedures.¹ Facial swelling postoperatively is the most common presentation, with the majority of cases (75%) occurring on the day of surgery.² Other important differentials for postoperative swelling include

static or expanding haematoma, allergic reaction and necrotising fasciitis.²

While this is a seemingly benign complication that often resolves spontaneously,¹ there is a risk of developing pneumomediastinum. This most commonly presents with dysphagia, dyspnoea, chest or back pain and cyanosis, as a result of upper airway compression and impaired cardiorespiratory function.² Other serious subsequent complications include pneumothorax and cardiac tamponade.³

The aetiology of emphysema is typically divided into anaesthetic and surgical causes. Traumatic intubation or over inflation of an endotracheal tube cuff causing tracheobronchial or laryngeal trauma can, in combination with excessive positive pressure intubation, cause air to collect within the tissue.^{2,3}

From a surgical perspective, excessive trauma can occur during tissue dissection, in this case the tonsils, which is made more difficult by adhesions caused by recurrent infections. Injury to the mucosal surface and underlying superior pharyngeal constrictor muscles can provide a potential entrance for air. The visceral layer around the capsule can extend into the thorax, oesophagus and superior mediastinum, providing a route along which air and subsequently swelling, can spread.¹⁻³

Additionally, this complication can be difficult to predict and prevent, as it is often a result of undetected or unavoidable trauma. If there are concerns, patients should be given basic advice to avoid activities that can increase pharyngeal pressure such as coughing, vomiting, sneezing, nose blowing and the Valsalva manoeuvre. Careful dissection during surgery is also advised to help minimise this risk.²

Treatment for this condition is initially conservative. Patients should be monitored for signs of respiratory distress or cardiac compromise and are typically placed on prophylactic broad-spectrum antibiotics, to prevent infection spread from the oral cavity.² Medications to suppress cough and antiemetics may also play a role in preventing worsening of the emphysema. In patients that develop pneumomediastinum, specialist input, airway support and interventions such as thoracotomy may be required.²

A literature review from August 2018 identified 43 individually reported cases. These patients were typically young, with no

Learning points

- ▶ Before considering tonsillectomy, its indications should be strictly reviewed and confirmed, due to association with potentially life-threatening complications.
- ▶ During tonsillectomy, careful intraoperative dissection and avoiding positive pressure ventilation can help reduce the chance of the development of surgical emphysema.
- ▶ If postoperative surgical emphysema is suspected, appropriate investigations to confirm the diagnosis should be performed, and patients should be admitted for a period of observation in the first instance.
- ▶ If intraoperative tonsillar dissection is difficult, the patient should be advised to minimise activities like vomiting, coughing, sneezing and nose blowing for the early postoperative period.
- ▶ The use of hydrogen peroxide for post-tonsillectomy bleeding may contribute to the worsening of cervicofacial surgical emphysema and its use should be reviewed if there is reason to suspect this diagnosis.

identifiable gender bias found. Very few cases required intervention—three needed reintubation, two required a thoracotomy and one required a temporary tracheostomy.²

The conservative treatment and subsequent resolution of this case of cervicofacial surgical emphysema is in-keeping with previous cases reported in the literature.

In conclusion, awareness of this rare, but potentially serious complication is important for those undertaking, or managing patients that have undergone, tonsillectomy. Due to this, postoperative facial swelling, dyspnoea, chest or back pain should be further investigated. Both the cases reported above, and the relevant literature have highlighted that cervicofacial surgical emphysema can be managed conservatively in the first instance and that patients undergo a period of monitoring for potential worsening and need for subsequent intervention.

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