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Pre-tracheal air cyst

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Abstract
Pre-tracheal air cysts or aeroceles are rare complications of tracheostomy. This is believed to be the first reported case in an adult presenting with a pre-tracheal air cyst 12 years after a tracheostomy. Only three case reports in children have been reported to date. The pathogenesis and treatment options are discussed and a method of managing this condition is suggested.

Key words: Cysts; Trachea; Tracheostomy; Adult; Post-Operative Complications

Introduction

Complications in tracheostomies range from 10 to 33 per cent.[1] Late complications include tracheal stenosis, tracheocutaneous fistula, tracheoesophageal fistula and tracheoinominate artery fistula.[2] The authors present a rare case of a pre-tracheal aircyst or aerocele occurring 12 years post-tracheostomy.

Case report

A 39-year-old female presented to the Accident and Emergency Department with a 24-hour history of a gradually progressive soft anterior neck swelling. The swelling was tender and she complained of a sensation of tightness in her throat on swallowing. She was suffering from an upper respiratory tract infection and had a cough but had no other significant medical complaints.

Twelve years previously, she had been involved in a road traffic accident sustaining head injuries requiring admission to the Intensive Therapy Unit and a tracheostomy. After a slow recovery period she was decannulated and allowed home. A week after her discharge, she was re-admitted with stridor secondary to laryngeal oedema. A second tracheostomy was performed. She was decannulated four months later but had a persistent tracheocutaneous fistula that was closed surgically. She had remained problem free for 10 years until her current presentation.

On physical examination, she was apyrexial and undistressed. There was a 4 cm by 5 cm soft fluctuant midline neck swelling superior to the tracheostomy scar. The skin over the swelling was erythematous and tense but there was no crepitus in the surrounding tissues (Figure 1). Fibre-optic examination with a flexible laryngoscope and a chest X-ray were unremarkable. The swelling was aspirated yielding air, but reformed when the patient coughed.

The patient was admitted and given intravenous antibiotics. A computed tomography (CT) scan revealed a large gas collection lying in the midline immediately anterior to the trachea (Figure 2). The tracheal wall was thin but appeared intact.

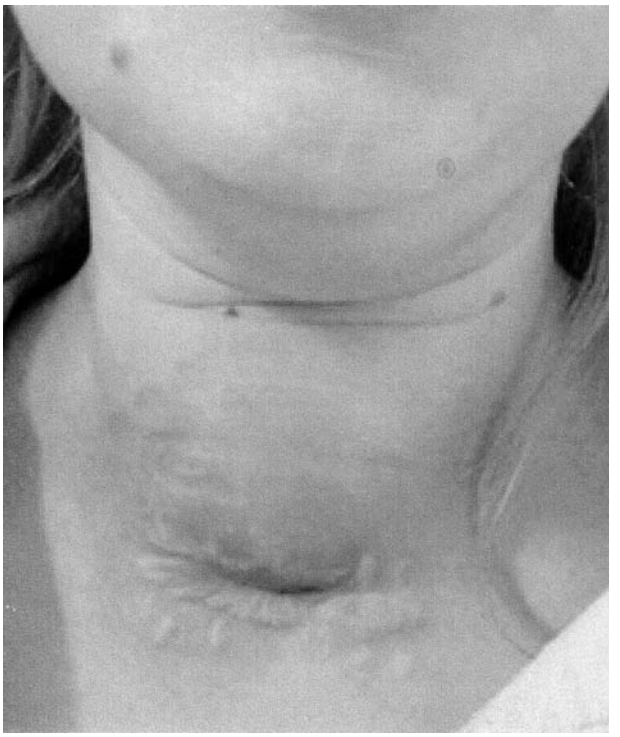

Fig. 1
Direct frontal photograph of patient showing an anterior neck swelling superior to a tracheostomy scar.

The cyst was incised under local anaesthetic, deflated and a pressure dressing applied to prevent its reformation. A bacteriological swab taken from the wound did not grow any bacteria. The patient was discharged home after three days. A small fistula at the incision site was present at a

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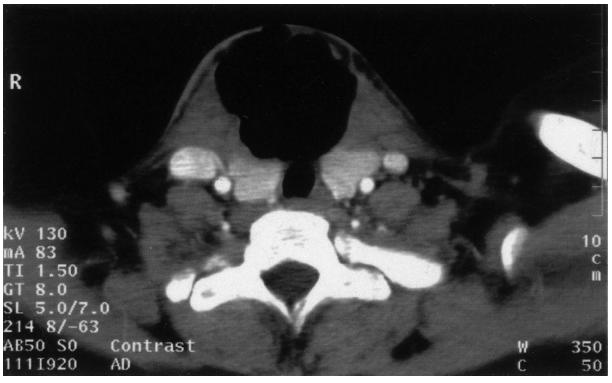

FIG. 2

Axial computed tomography scan of neck showing a collection of air anterior to the trachea.

two-week clinic review. The wound was dressed with an airtight dressing and the fistula and cyst had resolved within six weeks.

- **An aerocele in the soft tissues has been previously reported as a complication of tracheostomy in children and have all been reported as occurring shortly following decannulation**
- **The authors claim that this is the first report of such a cyst in an adult**
- **In addition, in this case, the patient presented with this complication 12 years following the original surgery**

Discussion

Pre-tracheal air cysts following tracheostomy are extremely rare. Only three paediatric case reports have been reported previously.[3, 4, 5] All three children had required prolonged tracheostomies and developed tracheocutaneous fistulas shortly after decannulation. In all these cases the cysts developed within a month of closure of the fistulas.

Lotan *et al*. postulate that the cutaneous end of a tracheocutaneous fistula closes over with granulation tissue, while the tracheal end remains open, thus creating a sinus tract and a possible source of the cyst.[3] The mechanism of formation of the air cyst as suggested by Rosbe *et al*. is thought to be due to a small defect in the anterior tracheal wall, which acts as a ball valve, allowing air to escape into the overlying soft tissue.[4]

In this case, it seems likely that the increasing subglottic pressure due to the coughing action together with structural weakness of the anterior tracheal wall, led to the patient developing a pre-tracheal air cyst. This was easily demonstrated with immediate re-accumulation of air when the patient coughed.

There have been different approaches in the treatment of tracheocutaneous fistulas as well as these cysts. This case and all three cases described in the literature had their tracheocutaneous fistulas closed surgically. Rosbe *et al*. advocated excision and exploration of the cyst, identification of the fistulous tract and placement of a drain for 24 to 48 hours.[4] The authors' approach was similar to that of Bent *et al*.[5] They found that simple decompression and pressure dressings were an effective way of obliterating the cyst. Bent *et al*. advocated the use of a drain in addition to the pressure dressings.[5]

Conclusion

A pre-tracheal air cyst is a rare late complication of tracheostomy. All the cases described had a previous history of a tracheocutaneous fistula after prolonged tracheostomy that required surgical closure. The diagnosis should be considered in the presence of a soft tissue swelling in the vicinity of an old tracheostomy scar. The authors have demonstrated that these cysts can be managed successfully in adults by aspiration drainage and pressure dressings. It is recommended that surgical excision be reserved for persistent or recurrent cysts.

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