

Acute tonsillitis complicated by retropharyngeal and thyroid abscess infected with de-repressed β lactamase *Citrobacter mutans*

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Abstract

An unusual presentation of acute tonsillitis complicated by retropharyngeal and thyroid abscess is reported. Spontaneous rupture of retropharyngeal abscess resulted in necrotic fistulae between the pharyngeal wall and the retropharyngeal space.

Key words: Tonsillitis; Retropharyngeal Abscess; Thyroid; Abscess; *Citrobacter*

Introduction

We present a case of acute tonsillitis complicated by retropharyngeal and thyroid abscess in a female patient with no previous thyroid disease and a normal immunological profile.

Case report

A 30-year-old female with a previous history of recurrent tonsillitis was referred by her general practitioner with acute tonsillitis not responding to oral antibiotics. Other than viral meningitis she had had no major illness in the past. On examination acute exudative tonsillitis and a predominantly right-sided tender anterior neck swelling at the level of the thyroid gland with overlying erythema was noted. She had an elevated white blood cell (WBC) count with negative monospot test. She responded well to 48 hours of intravenous benzylpenicillin and metronidazole and the neck swelling was resolving. She was discharged on oral antibiotics and placed on the waiting list for tonsillectomy.

However, two days later she was re-admitted with increasing dysphagia, muffled speech, mild dyspnoea and coughing-up of brownish fluid. She had a fever of 39°C. Throat examination revealed an inflamed pharynx and pooling of saliva in the hypopharynx on fibre-optic endoscopy. She had a prominent tender neck swelling with overlying erythematous skin in the region of the thyroid gland. Blood investigations showed a high neutrophil count and a raised erythrocyte sedimentation rate (ESR). Lateral soft tissue X-ray neck revealed the presence of gas within the soft tissues of the neck, both anterior and posterior to the trachea with reversal of the cervical spine curvature.

The retropharyngeal gas shadow extended along the length of the cervical spine almost into the thoracic inlet (Figure 1). Chest X-ray was normal. Computed tomography (CT) scan revealed a large retropharyngeal and a

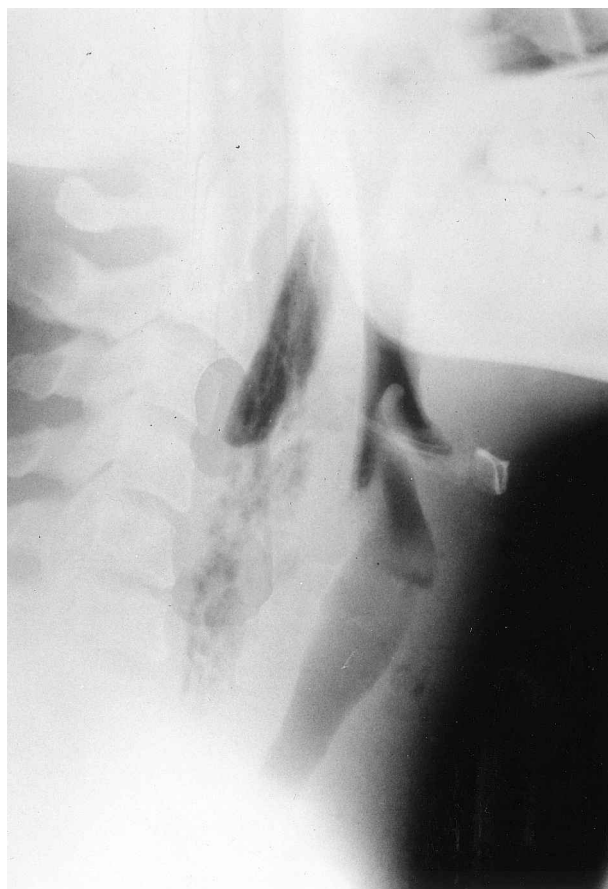


Fig. 1

Lateral soft tissue neck revealing extensive gas anterior and posterior to trachea.

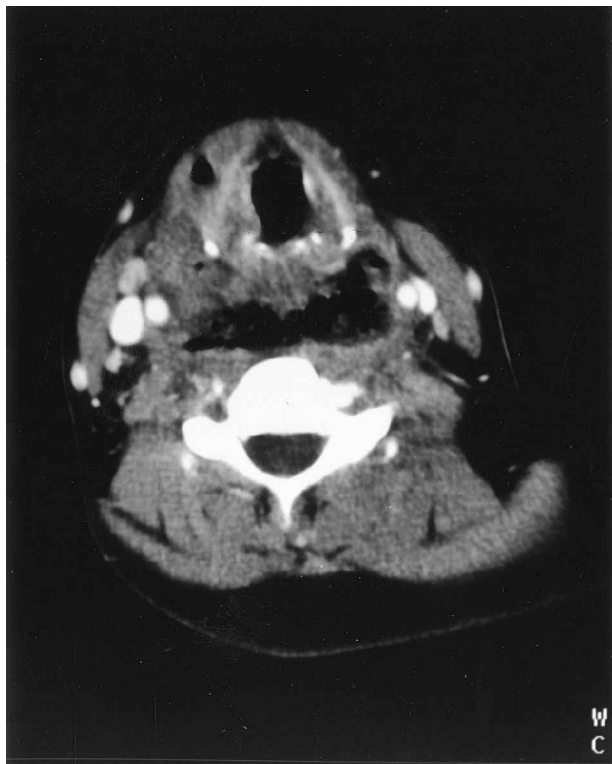


Fig. 2

CT neck revealing a large retropharyngeal and a right thyroid abscess.

right thyroid abscess (Figure 2). The patient underwent neck exploration through a transverse skin incision. An abscess involving the right thyroid lobe and isthmus with pus tracking into surrounding structures was drained. Thyroid tissue was sent for histology. A corrugated rubber drain was placed in the abscess cavity. She was started on intravenous gentamicin and benzylpenicillin. The pus on culture revealed *Citrobacter freundii*, *Enterobacter cloacae* and *Streptococcus oralis*. It was negative for mycobacteria and actinomyces. Her antibiotic treatment was then modified accordingly, she was given cefotaxime, gentamicin, amoxicillin and metronidazole. Histology of the thyroid tissue revealed an extensive mixed inflammatory cell infiltration with evidence of tissue necrosis, pus and abscess formation with no evidence of previous thyroid disease. The serum thyroxine was raised and thyroid-stimulating hormone (TSH) was low. She remained pyrexial with worsening dysphagia which necessitated nasogastric tube feeding. Five days later due to worsening condition, she was taken back to theatre for neck re-exploration. A transverse neck crease incision was made, tissues were oedematous and tissue planes were difficult to identify. A large abscess of the right thyroid lobe extending into the isthmus with pus communicating with the retropharyngeal space medial to right carotid sheath was noted and drained. Pharyngoscopy revealed two areas of mucosal defects (fistulae) in the pharynx at the level of the pyriform sinus connected with the retropharyngeal cavity. These appeared to be necrotic defects due to the infection. Post-operatively she was given nasogastric feeds and kept nil orally. She was admitted to the intensive care unit and needed ventilatory support.

The immunological profile was normal and she was human immunodeficiency virus (HIV) negative. The pus on culture grew *Citrobacter freundii* resistant to β -lactam antibiotic for which it was initially sensitive. Cefotaxime, was therefore replaced with imipenem 1 gm tds in addition

to gentamicin, amoxicillin and metronidazole. Post-operative recovery was slow and she was on the intravenous antibiotic regime for approximately three weeks. Repeat CT scans done after four weeks revealed resolution of the abscess cavities. Repeat thyroid function tests revealed raised TSH (10.48 mU/l) and normal free thyroxine (T_4) (15.1 pmol/l) indicating subclinical hypothyroidism. She was discharged on nasogastric feeds. A repeat barium swallow four weeks later revealed normal appearance with healed fistulae. Oral feeds were commenced. Thyroid function returned to normal. No further problems were reported on follow-up in out-patients, one year later.

Discussion

The patient's immunological profile was normal and she had no previous thyroid disease. The bacteriology revealed a well-documented and interesting phenomenon namely de-repressed β -lactamase production by *Citrobacter* sp. This phenomenon is present in a number of 'coliform-type' micro-organisms such as *Enterobacter* spp, *Serratia* spp and *Morganella morganii* where there is usually a baseline β -lactamase production that increases to transient high levels in the presence of certain β -lactamase antibiotics (the inducer). Permanent hyperproduction (de-repression) can arise by mutation after initial induction when the micro-organism will be selected as a stable de-repressed mutant as in the case above. Amoxicillin and to a lesser extent cefotaxime are strong inducers and labile to β -lactamase, while although imipenem is a strong inducer, it retains its activity against these mutants.¹ This phenomenon is usually anticipated in immunocompromised patients with bacteraemia, pneumonia or patients with deep abscess(es).

Thyroid abscess(es) are usually bacterial in origin and were more frequent in the pre-antibiotic era. The thyroid gland's rich blood supply, encapsulation, high iodine content and generous lymphatic drainage may render it resistant to bacterial infection. The disease is more common in women usually between 20–40 years old. Pre-existing thyroid disease and immunocompromised status are pre-disposing factors for development of this infection.² Infection may reach the thyroid via haematogenous spread from distant sites, via the lymphatics as a result of local infections such as pharyngitis and mastoiditis, infection of contiguous structures, persistent thyroglossal ducts, internal fistulae near the thyroid and penetrating neck injuries. Thyroid abscess has been reported on a few occasions due to the presence of a congenital fistula between the thyroid gland and the pyriform sinus.^{3–6} The possibility of a congenital internal fistula between the pyriform sinus and thyroid gland in our case was raised, but ruled out on endoscopy, barium swallow and CT scans.

Acute retropharyngeal abscess in adults may be idiopathic, secondary to trauma, penetrating foreign body, tuberculosis of the cervical spine or via lymphatic spread of infection from the head and neck. Rarely it may follow an extension of infection from a peritonsillar abscess.⁷ Retropharyngeal abscess complicating acute purulent thyroiditis has been described.⁸ Retropharyngeal abscess following acute tonsillitis in adults is rare.

The most likely route of infection of the thyroid gland and retropharyngeal space in this case is lymphatic spread from the infected tonsils. Extensive pus collection in the retropharyngeal space led to the fulminant neck space infection and subsequent necrotic fistulae of the posterior pharyngeal wall. No risk factors for this unusual and severe suppurative infection were identified. The simultaneous

complications of thyroid and retropharyngeal abscess resulting in necrotic fistulae of pharynx following acute tonsillitis have not been described in the literature.

In conclusion, the rare possibility of retropharyngeal or thyroid abscess in patients presenting with acute tonsillitis should be considered. Preliminary investigation should include a lateral soft tissue neck X-ray. Further details of the abscess are shown well by CT.

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Ms S. Maini takes responsibility for the integrity of the content of the paper.

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