Tonsillitis
The worst-case scenario

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As a GP working in your own practice and the local emergency department, you frequently see patients who present with a sore throat and associated symptoms.

The case

A 19-year-old girl presents to the emergency department (ED) with three days of sore throat. She has had associated headache, nausea, subjective fevers and malaise. Today her headache has been getting worse throughout the day, so she presented to hospital. She saw her GP 24 hours ago and was started on cefalexin 500 mg four times daily. She has recently travelled interstate to compete in a triathlon, but has not travelled internationally. She has no known infectious contacts. She has no known medical diagnoses and takes no regular medications.

On examination, the patient is febrile (temperature, 38.0°C) with blood pressure 126/69 mmHg, heart rate 108 beats per minute, oxygen saturation 96% on room air and respiratory rate 18 breaths per minute. She looks unwell and miserable. Her mucous membranes are slightly dry. She has bilaterally enlarged red tonsils with a visible purulent exudate, which is possibly worse on the right side than the left side. There is no evidence of palatal involvement or uvula deviation. She has mild cervical lymphadenopathy and is able to swallow her saliva, but winces as she swallows. There are no other abnormalities on cardiovascular, respiratory or gastrointestinal examination.

Investigations and treatment

You place an intravenous cannula and take blood samples for testing. While you wait for the test results you give the patient intravenous (IV) dexamethasone 8 mg to decrease the swelling and help her to swallow, one litre of Hartmann's solution over one hour, benzylpenicillin 2.4 g and lidocaine (lignocaine) oral liquid 10 mL to gargle. She is admitted to the ED short stay unit (SSU) for intravenous rehydration and analgesia.

Her results are returned and show a white cell count of 24×10^9/L (reference range [RR], 4.0 to 11.0×10^9/L), haemoglobin level of 165 g/L (RR, 130 to 180 g/L), platelet count of 162×10^9/L (RR, 150 to 400×10^9/L), neutrophil count of 3.65×10^9/L (RR, 2.0 to 7.5×10^9/L) and lymphocyte count of 20.42×10^9/L (RR, 1.5 to 4.0×10^9/L). An infectious mononucleosis qualitative screen is positive for Epstein-Barr virus (EBV) infection.

You re-review the patient and observe that she has ongoing difficulty swallowing. She has no rash or other complications. You arrange combined admission under the ear, nose and throat and general physicians. No bed is available on the ward, so the patient remains in the ED SSU overnight. You check on her the next day and note that her pain has worsened and has now moved to the middle of her anterior neck. She has had fever to 38.3°C overnight and is still having difficulty swallowing, due to pain. On examination, her throat is still red, with no signs of quinsy. There is submandibular lymphadenopathy. She is able to stick out her tongue but it is very painful to do so.

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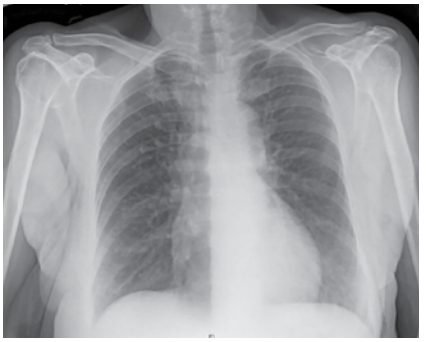
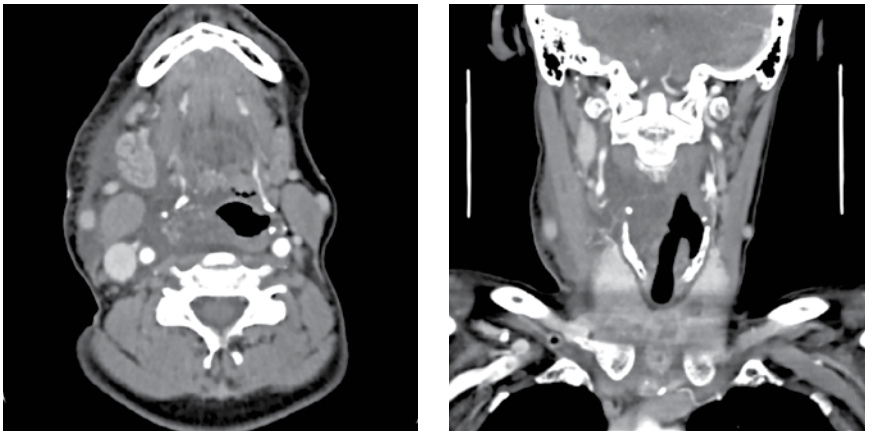


Figure 1. Chest x-ray showing narrowing of the trachea, no consolidation in the lung fields and no mediastinal widening.



Figures 2a and b. CT neck soft tissue with intravenous contrast (a, left, axial view; b, right, coronal view). The images indicate right tonsillitis complicated by a tonsillar abscess with marked soft tissue thickening and stranding of the oropharyngeal mucosa. There is a retropharyngeal abscess extending from the oropharynx down to the level of the glottis. There is no discrete collection. The airway is patent but narrowed and displaced to the left.

You order a CT scan of the soft tissue of the neck with IV contrast and inform the ear, nose and throat physician that you are concerned the patient has developed a retropharyngeal abscess. You broaden her antibiotic coverage to cefazolin 2 g IV every six hours and metronidazole 500 mg IV every 12 hours. You give another 12 mg of dexamethasone IV and move her to the resuscitation bay for close airway observation. You prepare a difficult-airway plan and ensure that equipment, including a video laryngoscope, fibreoptic tube and rapid sequence intubation medications, is at the bedside. You order a chest x-ray using a portable machine (Figure 1). You escort the patient for the CT scan, which shows right tonsillitis complicated by a tonsillar abscess and a retropharyngeal abscess extending from the oropharynx down to the level of the glottis (Figures 2a and b). She is transferred to the high dependency unit and taken to the operating theatre the following day for drainage of the retropharyngeal abscess and intraoperative intubation. Her blood culture results are delayed by several days, but show no growth. She is monitored closely and makes a full recovery after 14 days.

Case discussion

An interesting question in this case is whether this illness was due to both bacterial superinfection of the EBV-infected tonsillitis and the secondary development of a retropharyngeal abscess, or whether the acute EBV infection was an incidental finding and the patient had an early retropharyngeal abscess. It can be difficult to differentiate clinically between viral and bacterial causes of a sore throat and many of the symptoms of retropharyngeal abscess are present

TABLE. CLINICAL SYMPTOMS AND SIGNS OF EPSTEIN-BARR VIRUS TONSILLITIS, BACTERIAL TONSILLITIS AND RETROPHARYNGEAL ABSCESS[1]

	Epstein-Barr virus tonsillitis	Bacterial tonsillitis	Retropharyngeal abscess
Clinical symptoms	• Severe pain • Dysphagia/odynophagia • Dysphonia	• Severe pain • Dysphagia/odynophagia • Dysphonia	• Severe pain • Dysphagia/odynophagia, dysphonia • Dyspnoea
Systemic signs	• Fever • Hoarse voice	• Fever • Hoarse voice	• Fever • Toxic appearance • Muffled voice (‘hot-potato’ voice) • Chest pain (mediastinal extension)
Localised signs	• Cervical lymphadenopathy	• Cervical lymphadenopathy	• Neck stiffness, torticollis, refusal to extend neck due to pain • Neck swelling • Cervical lymphadenopathy

1. FEATURES IN ADOLESCENTS AND ADULTS THAT INCREASE THE LIKELIHOOD OF A DIAGNOSIS OF INFECTIOUS MONONUCLEOSIS[3]

- Presence of posterior cervical, inguinal or axillary lymphadenopathy
- Palatine petechiae
- Splenomegaly
- Atypical lymphocytosis

in all three of these diseases (Table).[1]

EBV infection is common, with seroprevalence studies suggesting 90% of adults have been infected by 40 years of age.[2] In developed countries, primary EBV infection tends to occur in adolescence and early adulthood (Box 1).[3] Younger children may present with similar symptoms of EBV infection to adults but usually have milder or subclinical presentations. There is no difference in epidemiological infection rates based on sex or race, and no time of year is associated with increased infection rates. The incubation period for EBV is 30 to 50 days.

The Australian Therapeutic Guidelines suggest that symptoms such as high fevers, tender cervical lymphadenopathy, tonsillar exudate and absence of cough can be used as indicators of streptococcal infection;[4] however, similar features are also stated to be symptoms of EBV infection.[2] Antibiotic use is indicated in high-risk patients presenting with sore throat (Box 2).[4]

The clinical picture is made more complex by the complications of antibiotic administration in patients with EBV. There is a widely documented phenomenon of rash developing after administration of antibiotics in patients with EBV. The rash is described as morbilliform or maculopapular, worse on extensor surfaces and pressure points, developing seven to 10 days after administration of beta-lactam antibiotics (ampicillin, amoxicillin and, less frequently, cephalosporins). This contrasts to the faint maculopapular, nonitchy rash that often presents on the trunk or upper arms before extending to the face and forearms, which is likely a viral exanthem.[5]

The phenomenon of postampicillin rash in patients with EBV was first reported in the 1960s with a high incidence of 80 to 100% in those exposed to antibiotics. Recent data suggest the incidence has declined to around 30%.[6] The exact mechanism causing this rash is still unknown; however, some experts suggest it is a hypersensitivity reaction not an allergy, as the rash does not appear when ampicillin is readministered in the same patient without the acute EBV infection. Alternatively, a direct toxic effect or transient immunostimulation by the virus could be the cause.[7]

The clinical picture is made more complex by the complications of antibiotic administration in patients with Epstein-Barr virus

Retropharyngeal abscess is most common in children under 5 years of age who develop suppurative cervical lymphadenitis secondary to an upper respiratory tract infection. In adults, it occurs less often and is more commonly caused by trauma to the posterior pharynx that leads to inoculation of the retropharyngeal space, leading to abscess formation.[8] Most retropharyngeal abscesses are polymicrobial, with *Streptococcus pyogenes* (group A streptococcus), *Staphylococcus aureus*, *Fusobacterium* and *Haemophilus* species and other respiratory anaerobic organisms most commonly found in cultures.[9]

Although mortality from sepsis does occur with a retropharyngeal abscess, the most common cause of concern is airway obstruction. Occasionally, extension along the retropharyngeal space can result in mediastinal extension of the abscess, which is associated with a significantly higher mortality rate. Treatment is focused on protecting the airway from obstruction with intubation (often fibreoptic) if required (in the operating theatre if time allows), source control with surgical drainage and broad-spectrum intravenous antibiotics, and sepsis care. MT

2. HIGH-RISK PATIENT GROUPS IN WHOM ANTIBIOTICS ARE INDICATED IF PRESENTING WITH SORE THROAT[4]

- Patients aged 2 to 25 years of age in communities with a high incidence of rheumatic fever
- Patients of any age with pre-existing rheumatic heart failure
- Patients with scarlet fever

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