Unusual presentation of more common disease/injury

Subacute bacterial endocarditis secondary to mastoiditis: a rare complication

Caroline Patricia Smith, Conor Jackson, Rosemary Stewart

Department of ENT, Antrim Area Hospital, Antrim, UK

Correspondence to Caroline Patricia Smith, caroline_smith19@hotmail.co.uk

Summary

Mastoiditis can result from untreated otitis media. If unrecognised, it can result in life-threatening complications. We present a 69-year-old woman with a history of left-sided otitis media admitted to intensive care unit following collapse with a decreasing Glasgow Coma Scale. Myringotomy and ventilator insertion revealed pus in the middle ear, which grew Group A *Streptococcus*. Her fever persisted and blood samples cultured Group A *Streptococcus*. Echocardiogram confirmed subacute bacterial endocarditis. Subacute bacterial endocarditis is a rare complication of mastoiditis. A literature review detected no previous case reports. A high suspicion of potential complications can prevent morbidity and mortality.

BACKGROUND

Acute otitis media, if untreated, can progress to mastoiditis. Mastoiditis has a number of well-recognised complications with significant morbidity and potential mortality. We present a case of acute otitis media with mastoiditis which was complicated by infective endocarditis.

CASE PRESENTATION

A 69-year-old woman presented to A&E accompanied by her daughter with a 24 h history headache, dizziness, confusion and vomiting. Glasgow Coma Scale on presentation was 12 and she had fever with a temperature of 38.5°C.

While being assessed, the patient had a witnessed seizure and became unresponsive. She required intubation and transfer to the intensive care unit (ICU).

On contacting the patient's general practitioner for further information it became apparent that the patient had a 4-week history of left-sided earache treated unsuccessfully with courses of amoxicillin, clarithromycin, sofradex drops and otomise.

INVESTIGATIONS

Prior to ICU admission an emergency CT brain was carried out showing soft tissue density in the left mastoid air cells suspicious of mastoiditis, with no intracranial pathology. A full septic screen was carried out including lumbar puncture which had no growth on Gram staining and no organisms seen (figure 1).

TREATMENT

The patient was treated with intravenous aciclovir, cefotaxime, amoxicillin and benzylpenicillin on advice from microbiologist.

OUTCOME AND FOLLOW-UP

An ear nose and throat referral was made on day 2. The patient remained feverish. Examination of the right ear was

normal, with a dull tympanic membrane on the left, dull moist attic and normal postauricular area. Myringotomy and vent insertion was performed in ICU revealing pus in the middle ear. This was swabbed and sent to microbiology, and gentamicin with hydrocortisone ear drops were started. A mastoidectomy was not performed at this time as the patient was thought to be unstable. An MRI was unfortunately not available on site to exclude the possibility of venous sinus thrombosis.

Blood culture results grew Group A *Streptococcus* sensitive to benzylpenicillin and ceftriaxone and intravenous antibiotics were adjusted accordingly. Cardiovascular

Figure 1 CT showing soft tissue density in the left mastoid air cells suspicious of mastoiditis, with no intracranial pathology.

examination revealed a systolic murmur which had not been documented previously in the patient's notes.

On day 3, the results for the middle ear swab became available which also grew Group A *Streptococcus*. Echocardiography was performed showing calcification and vegetation of the aortic valve in keeping with a diagnosis of subacute bacterial endocarditis (SBE; figure 2).

The patient was successfully extubated and transferred to the coronary care unit the next day for ongoing care and 6 weeks of intravenous antibiotics to treat SBE. She developed transient atrial fibrillation and acute renal failure during admission. Serial audiograms were performed which showed a resolving left-sided hearing loss. A transoesophageal echocardiogram was carried out prior to discharge showing no vegetations (figure 3). The total duration of inpatient stay was 43 days.

DISCUSSION

Despite major advances in diagnosis and treatment, infectious endocarditis remains a serious disease with significant morbidity and mortality of more than one-third within the first year of diagnosis.¹

The management of this disease was improved greatly when antibiotic therapy was introduced in the 1940s; however, mortality has not significantly decreased since the 1970s.¹ This is thought to be due to the increasing age of patients and healthcare-associated infective endocarditis. The frequent causative agents are now often aggressive staphylococci, resistant enterococci or fungi.^{1 2}

Common causes of deaths related to infective endocarditis (IE) include heart failure, stroke, multiorgan dysfunction and sepsis as well as sudden death.^{1 2}

Echocardiography plays a central role in the diagnosis of IE to detect endocardial involvement. It often demonstrates valve lesions and is also important for the assessment of tissue destruction such as abscesses, fistulae, perforations and avulsion of chordae tendinae.³

Transthoracic echocardiography (TTE) is the initial investigation of choice and should be carried out as soon as possible in suspected cases with weekly scanning thereafter to assess resolution or possible complications.¹⁻⁴

Transoesophageal echocardiography is useful in cases of negative TTE with high clinical suspicion, poor TTE quality, prosthetic valves or intracardiac device and positive TTE.^{1 2} In complex cases new imaging techniques such as three-dimensional echocardiography, multislice CT, positron emission tomography molecular imaging and MRI are emerging techniques to assist diagnosis.¹

Early assessment of prognosis is recommended in those diagnosed with IE to identify patients at high risk. Strong predictors for negative outcomes include large or enlarging vegetations, paravalvular extension of infection, pulmonary hypertension and high brain natriuretic peptide and troponin levels. This may help with decision-making for management that is, medical/surgical and admission to ICU/critical care unit.^{1 2 4}

Treatment should be initially with broad spectrum intravenous antibiotics following blood cultures, with the antibiotics adjusted as necessary when a causative organism has been identified. Prompt antibiotic therapy can avoid severe sepsis, multiorgan dysfunction and sudden death.¹

The Duke criteria⁵ is a well-known tool used to aid diagnosis of IE. It is a collection of major and minor criteria. Minor criteria include pyrexia and predisposing factors such as prosthetic valve and intravenous drug use. However, echocardiography and blood cultures are the cornerstone in diagnosing IE and although the Duke criteria is useful for classification, it does not replace clinical judgement.²

Surgical intervention is indicated in patients with heart failure, uncontrolled infection or to prevent embolism² with the aim being to resect all infected tissues and valve repair if possible.¹

Close long-term follow-up is recommended in patients diagnosed with IE due to the potential complications that can extend beyond patient discharge.¹

There are numerous well-recognised complications of mastoiditis including meningitis, brain abscess and lateral sinus thrombosis. IE is a rare complication of mastoiditis. A literature review detected no previous case reports. A high suspicion of potential complications can prevent morbidity and mortality.

Figure 2 Initial transthoracic echocardiography showing calcification and vegetation of the aortic valve.

Figure 3 Transoesophageal echocardiography performed following treatment showing no vegetation of the aortic valve.

Learning points

- ▶ Mastoiditis can result from untreated otitis media. If unrecognised, it can result in life-threatening complications.
- ▶ Subacute bacterial endocarditis is a rare complication of mastoiditis.
- ▶ A high suspicion of potential complications can prevent morbidity and mortality.

Competing interests None.

Patient consent Obtained.

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