

Recurrent temporal petrositis

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Abstract

The objective of this paper is to present and discuss the common features of temporal petrositis and the different approaches to its management. Petrositis used to be common before the antibiotic era. It can be associated with life-threatening complications. The management of this problem used to be by an aggressive surgical approach. However, recent reports are describing good results with more conservative medical treatment and minimal surgical intervention, with the reservation of more aggressive surgical interventions for chronic or refractory cases.

Key words: Temporal Bone; Infection; Abducens Nerve; Child

Introduction

Petrositis used to be very common at the beginning of the 20th century. However, with the availability of antibiotics mid-century, this infection is now rare. The incidence of acute petrous apicitis is reported to be approximately two in 100 000 children with acute otitis media.¹

Thirty per cent of petrous bones have air cells extending into the apex.² However, petrous apex pneumatization is not essential for the spread of the infection.³ Petrous apicitis could be as a result of direct extension due to bone destruction or by way of venous channels.⁴

The petrous apex may be involved with either acute or chronic temporal bone infection. The infection may spread outside the petrous apex to affect the meninges, cranial nerves, or even cause encephalitis or brain abscess.

Temporal petrositis may present with the triad of otorrhoea, pain in the distribution of the Vth cranial nerve and abducens palsy, classically known as Gardenigo's syndrome.³ However presence of all of these findings is not essential to indicate the presence of temporal petrositis. The presence of abducens palsy is not a very consistent finding in the patients with petrous apicitis, and should not be relied on to make the diagnosis.⁵

Asymptomatic petrositis may complicate acute or chronic mastoiditis. In a chronically suppurative ear, the presence of deep ipsilateral earache may indicate the presence of petrous apicitis.⁵ The presence of infected air cell tracts during the mastoidectomy, especially those filled with granulation tissue, leading to the apex may indicate the involvement of the petrous apex.⁵ The associated pain could be due to dural involvement over the petrous apex, direct irritation of the Gasserian ganglion, or referred pain from the ear.⁶

The involvement of the VIth cranial nerve is thought to be as a result of inflammation of the nerve as it passes through Dorello's canal under the petroclinoid ligament.^{5,6} Petrous apicitis may also present with facial nerve palsy and vertigo.⁷

In this paper a presentation of a child with recurrent petrositis and recurrent VIth cranial nerve palsy is reported.

Case report

The patient was an eight-year-old Sudanese boy, who was known to have suffered from recurrent bilateral ear infection for approximately three years. The left side was involved more commonly than the right side.

At the age of six years the child developed an acute left ear infection that was associated with severe left earache. At the time there was no otorrhoea nor fever. Ear examination revealed an acutely infected left ear with an erythematous and bulging tympanic membrane. It was associated for the first time with left VIth cranial nerve palsy, and double vision appearing in the left lateral gaze (Figure 1).

Right ear examination revealed only fluid behind an intact tympanic membrane. The remainder of the ENT, head and neck and general examination were normal. Initially the child was treated with amoxycillini-clavulanic acid for one week. This resulted in resolution of the earache; however, there was still some limitation of the eye movement on the involved side. The left tympanic membrane was slightly bulging, with some fluid in the left middle-ear cavity.



FIG. 1

Demonstrates limited ocular movement of the left eye in the left lateral gaze.

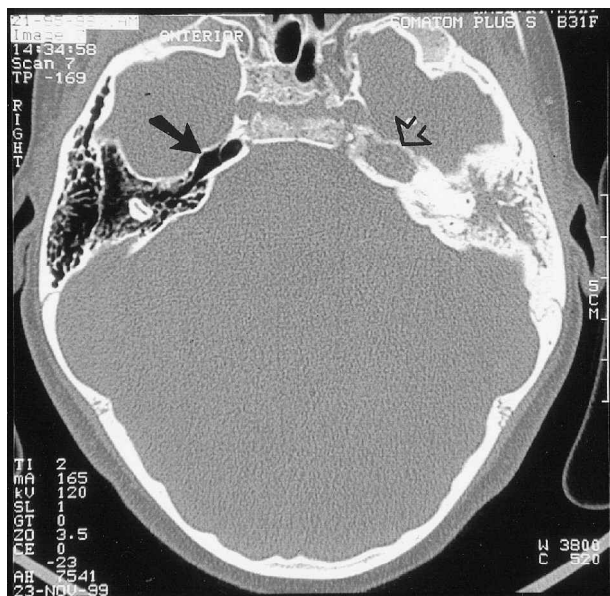


FIG. 2

CT scan of the temporal bone; demonstrates the extensive pneumatization of the petrous apex bilaterally. Opacification of left mastoid and petrous apex (open arrow), non-involved right petrous apex (black arrow).

Computed tomography (CT) scan showed extensive pneumatization of the petrous apex bilaterally, with opacification of the air cells in the left mastoid and left petrous apex (Figure 2). Left myringotomy and aspiration of thick secretion from the middle-ear cavity and insertion of a ventilation tube was performed. The ocular movement was back to normal in one week following this intervention. The ventilation tube, however, was extruded one year later. The child developed two attacks of ear infection within three months after tube extrusion. The last attack was associated with deep-seated left headache and paralysis of the left VIth cranial nerve with diplopia on left lateral gaze. There was erythema of the left tympanic membrane, which was intact.

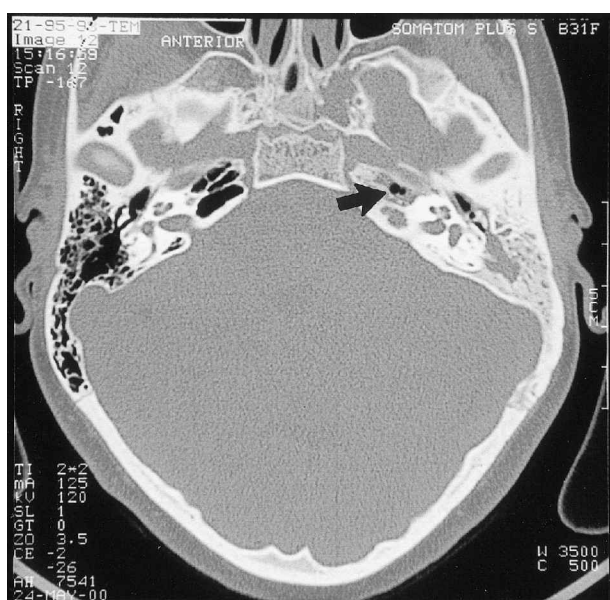


FIG. 3

CT scan demonstrating the resolving petrositis (black arrow) after antibiotic course and performing myringotomy and insertion of ventilation tube.

Treatment with cefaclor was initiated and left myringotomy and insertion of a ventilation tube was repeated. A mucopurulent fluid was aspirated from the middle-ear cavity. Complete ocular mobility was regained in 10 days after insertion of the ventilation tube. CT scan was repeated two weeks after this intervention (Figure 3).

We followed the patient for nine months after the second intervention, the ventilation tube again came out. Fluid accumulated behind the left tympanic membrane. However, there were no signs of acute ear infection. Prophylactic myringotomy and insertion of a ventilation tube was performed for the third time.

Discussion

The signs and symptoms of Gradenigo's syndrome could be the result of petrous bone pathology other than petrositis.⁶ Tumours of the petrous apex such as meningioma, neuroma, or metastases, as well as cholesteatoma, intracranial aneurysm could be the underlying pathology.

Temporal petrositis used to be associated with very severe complications before the antibiotic era. These complications included, labyrinthitis, meningitis, intracranial abscess formation, retropharyngeal abscess, venous sinus thrombosis, haemorrhage secondary to carotid artery erosion, cranial nerve palsies and diplopia.^{4,6}

The commonest cause of diplopia is infranuclear cranial nerve palsies secondary to diabetes or microvascular disease.⁸ However, other uncommon causes of diplopia, such petrous apicitis, could be the underlying cause.

Treatment of patients with petrositis is a very challenging problem. The surgical approach to the petrous apex had evolved since the beginning of the 20th century, mostly with aggressive surgery. Goris⁹ in 1903, and Streit¹⁰ in 1903 advocated an extradural middle cranial fossa approach to the petrous apex. Uffenorde¹¹ in 1918 used the more aggressive approach of radical mastoidectomy and labyrinthectomy to drain the petrous apex. Eagleton¹² in 1931 presented more than one approach to the petrous apex, by extradural middle cranial and posterior cranial fossa, labyrinthectomy, and beneath the posterior semicircular canal. Ramadier¹³ in 1933 and Lempert¹⁴ in 1937, advocated entering the apex through a triangular area between the cochlea, middle cranial fossa dura, and internal carotid artery. Dearmin¹⁵ in 1937 used an approach beneath the labyrinth and behind the facial nerve through the mastoid.

Now with the availability of antibiotics, control of petrous apex infection is more efficacious. However, spread of the infection beyond that area is still seen in some patients.

Recent reports have documented good results by using more conservative therapy of high dose broad-spectrum antibiotics with intracranial penetration and less aggressive surgery.¹ Minotti *et al.*,³ in their review of literature, recommended treating patients with acute temporal apicitis and abducens nerve palsy conservatively, using intravenous antibiotics combined with myringotomy and large-bore tympanostomy tubes.

This approach worked very well in our patient. Resolution of the problem was achieved twice using this conservative management. However, the patient still had recurrent features of Gradenigo's syndrome with the succeeding ear infection after extrusion of the ventilation tube.

More aggressive surgical intervention is reserved for patients with refractory problems and those who demonstrate signs of chronic temporal apicitis.

Chronic petrositis may produce permanent mucosal thickening as a result of fibrous proliferation. This could result in central cystic spaces surrounded by thickened and diseased mucosa that are difficult to treat.¹⁶ This may result in failure of conservative management in some cases, and repeated infection in others.

In conclusion, petrositis used to be common before the antibiotic era. It can be associated with life-threatening complications. The management of this problem used to be with aggressive surgical approaches. However, recent reports describe good results with more conservative medical treatment and minimal surgical intervention, with reservation of more aggressive surgical interventions for chronic or refractory cases.

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The author takes responsibility for the integrity of the content of the paper.

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