

A Case Report

OSTEOMYELITIS OF THE TEMPORAL BONE IN A YOUNG CHILD: A DIAGNOSTIC AND CLINICAL CHALLENGE.

Boghossian Sh. M.*

University of Newcastle, Newcastle, UK

Abstract

Osteomyelitis of the temporal bone is a rare clinical condition. It is common in operations involving the base of the skull, in tuberculosis and in immunocompromised patients. The report shows a unique case whereby a fully immunocompetent patient presents with periauricular exudation of an unclear aetiology. The case raised questions whether the patient, who was originally from the Arabian Peninsula, had acquired a tropical infection or some novel disease, or possibly immunosuppression. After a lengthy series of investigations a diagnosis of osteomyelitis of the temporal bone was diagnosed.

Keywords: immunocompetence, leishmania, lymphadenopathy, mandibular condyle, mastoidectomy, mycobacteria, myringotomy, osteomyelitis, sequestrum, temporal bone.

Introduction

A.A. was a young girl of Yemeni parents: born in Yemen and moved to the UK at the age of 2. At the age of 3 she presented to her community doctor with a swelling in her left external auditory canal and a carbuncle on her left cheek. The doctor, who initially examined her, found no lymph node swelling. He prescribed her Neomycin, Gramicidin and Triamcinolone Acetonide as ear drops and oral ofloxacin for 2 days. The swelling did not improve and thus she was referred to the district general hospital to be seen by a paediatrician. Her history was reviewed again. A.A. was born to healthy parents and her developmental milestones were normal for her age. At the age of 1 she had a similar episode of auricular discharge in Yemen. However, her past medical notes from Yemen were not available at the time of admission.

Physical examination: Playful and engaging, her hearing was normal, afebrile with normal cranial nerve examination and no lymphadenopathy. A carbuncle was noted on her left cheek (Figure 1).

Treatment: Fucidic acid and Flucloxacillin as an empiric therapy.

Plan: Collect swabs from cheek and auditory canal for culture and sensitivity including mycobacteria.

Blood Analysis: An elevation of white cell count with pronounced lymphocytosis was

revealed; the rest of parameters were normal.

An ENT/ORL opinion was sought. The ENT (Ear, Nose and Throat) doctor examined patient's ear and mopped it dry. Gentamycin ear drops were instilled. Two days after initial admission, a paediatric MRI scan under sedation was undertaken which showed that a tract had formed from the parotid gland emptying externally onto the skin. Additionally there was a high signal in the



Figure 1. An encrustation anterior to the auditory canal.

Address for correspondence: Mr. Shahe Boghossian
University of Newcastle Cookson Building
MRG Group, 4th floor, Newcastle, UK
E-mail: Shahe.boghossian@ncl.ac.uk

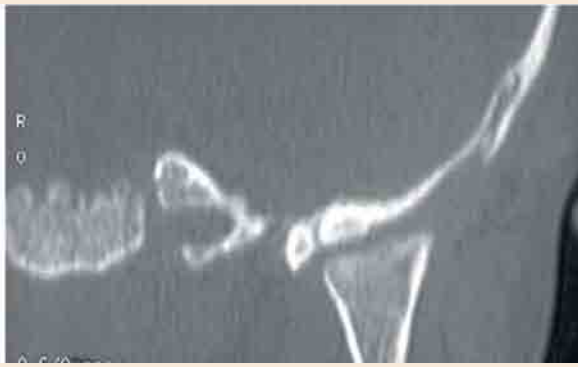


Figure 2. MRI scan showing an enhancement of the signal of the mandibular condyle.

mandibular condyle (Figure 2). The following day she was taken again to operating theatre for another examination under anaesthesia. A polyp was found in the external auditory meatus, which was taken out and a wick soaked in chloraminphenicol was put in place. The result of the bacterial culture came back showing heavy growth of non-MRSA *Staphylococcus aureus* sensitive to flucloxacillin and fucidic acid. The carbuncle on her face dried out and she was sent home with oral flucloxacillin with a follow up appointment in one week.

After 3 days of discharge *A.A.* referred back again due to exudation from her ear as well as new swelling behind her ear. She was taken immediately to theatre. On examination, the exudative tract from the ear canal ended blindly underneath the zygomatic process of the temporal bone. Pus was also coming from the posterior part of the ear canal, and hence a myringotomy was performed. The post-auricular swelling was cut open (limited cortical mastoidectomy) and 5 ml of pus were evacuated and a loose piece of bone was removed (Figure 3). All the samples were sent for bacterial and fungal screen. A drain was left at the site of the cortical mastoidectomy. After three days of continued oral antibiotics she was discharged to be followed up in one week.

Almost 4 weeks after initial discharge, a case conference involving tropical medicine consultants, ENT, paediatricians and neurosurgeons was held. Given the fact that the patient originally hailed from Yemen, it could have been possible that she might have contracted some disease during childhood. The opinion of the tropical medicine consultant was to put her on high dose Clindamycin for 6 weeks. At this stage a computed tomography (CT) scan with contrast was done. The scan showed soft tissue swelling around the ear, the squamous

part of the temporal bone appeared to be thickened and moth eaten. A sequestrum measuring 8 mm was lying separately from the bone. There was a defect in the mastoid process suggesting a previous operation. Associated with this, the mandibular fossa and the mandibular condyle looked irregular. No collections were seen intra-cerebrally. The appearance suggested an osteomyelitis of the temporal bone (Figure 4).

The medical report from the patient's home country of Yemen had arrived detailing that at the age of 1, she had otitis media with rupture of the tympanic membrane, and she was put on antibiotics with no improvement. Six months later *A.A.* had similar problems and cortical mastoidectomy was undertaken which was limited to her age.

Almost 9 weeks after initial admission, all her symptoms had resolved. Her facial scar was healing well. There was no discharge from her ear canal. Her post auricular incision was healing well with a very small suture abscess. The patient was reviewed for one last occasion from a neurosurgeon who postulated that there is no connection between the sequestrum of the temporal bone and the swelling in the tympanomastoid region.

Finally after 10 weeks of lengthy investigations, *A.A.* was discharged back into the community with follow-up in 6 months.

Discussion

The case describes a situation whereby an immediate diagnosis of the temporal bone osteomyelitis could not be ascertained. The lengthy investigations were crucial to reach the correct diagnosis and not to throw in every empiric treatment modality available.

Patient's background opened further possibilities about her pathology. Although her ancestral

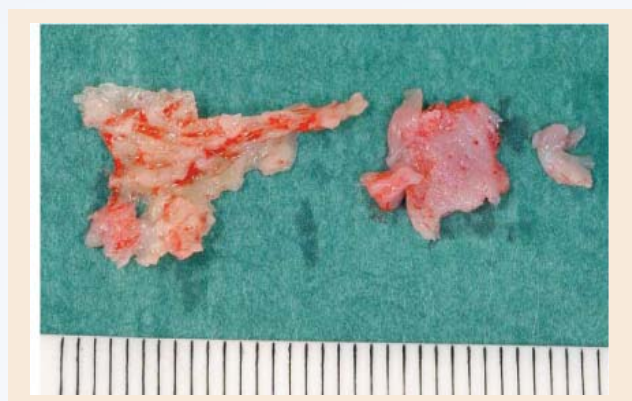


Figure 3. Loose piece of bone taken from the external auditory canal.



Figure 4. The loose piece of sequestrum in the temporal bone.

background was not investigated, it could have been possible that people from the Arabian peninsula have a genetically different white cell profile (Yemeni Jews) [Weingarten M. et al., 1993]. The proximity of Yemen to the Horn of Africa meant that tropical diseases could be a potential cause. Additionally lymphomas and leukaemia are well known to cause immunosuppression [Murray R. et al., 2008]. Possible alternative diagnosis could have been leishmaniasis [Lupi O. et al., 2009], histoplasmosis [Ferreira M.S., Borges A., 2009], hereditary immune deficiencies [Dragon-Durey M.A., Fremeaux-Bacchi V., 2006], actinomycosis [Brook I., 2008], cryptococcal abscess [Gologorsky Y. et al., 2007], tuberculous osteo-

myelitis [Mushkin A. et al. 2008,], fibrous dysplasia [Kusano T. et al., 2009] and inflammatory vascular conditions.

On its own temporal bone osteomyelitis is a rare clinical condition [Alva B. et al., 2009]. It can be acquired iatrogenically mainly through procedures involving the skull, epidural abscesses, cavernous sinus thromboses, in patients who are immunosuppressed either through medication, e.g. cortisol or metabolic syndromes like diabetes or through acquired infections like HIV [Chakaya J., 2008] or more recently with the use of bisphosphonate therapy [Wimalawansa, S, 2008]. Of particular interest would be diabetics who commonly have *Pseudomonas Aeruginosa* as the pathogenic organism [Tierney M.R., Baker A.S., 1995; Amorosa L., 1996]. .

Eventually after gathering all the data and intense scrutiny of the above conditions, a conclusive diagnosis of osteomyelitis of the temporal bone was confirmed. The unusual location of the lesion and the consistency of the discharge prompted surgical exploration. This exploration evacuated a piece of bone from the mastoid that was distinct from the temporal bone (spotted on CT). The CT and MRI scans helped us in the diagnosis but a sound clinical judgement was imperative to reach a proper diagnosis.

Pearls of Practice:

1- Use technology effectively but be aware of its limitations and do not jump in for surgery without assessing the repercussions.

2- Use sound clinical judgement and be aware that common things are common but once in a while we do get uncommon pathologies.

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