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Supra-auricular cutaneo-cutaneous fistula

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Abstract

A case of cutaneo-cutaneous fistula superior to the external auditory canal extending from the mastoid skin to the skin over the zygoma is reported. The adult patient presented with recurrent discharge and swelling of the skin over the zygoma and mastoid bones. Definitive treatment was in the form of complete excision of the fistula tract.

Keywords

Mastoid abscess; zygomatic abscess; fistula; sinus; CT imaging.

Introduction

Fistulae or sinuses around the pinna may be congenital or acquired. Congenital sinuses are usually pre-auricular sinuses caused by defective embryologic development of the pinna; first branchial arch fistulae are much rarer (only 8% of all branchial anomalies)[1]. Acquired fistulae may develop as a result of tumours or infection such as mastoiditis. Complications of mastoiditis caused by extension of infection beyond the mastoid itself are well recognised[1–3]. Lateral extension may result in a subperiosteal abscess, inferior extension into the digastric groove in a Bezold abscess[4], posterior extension into the occipital bone in a Citelli abscess, and anterior extension of infection may lead to zygomatic abscess[5]. The incidence of subperiosteal abscess secondary to mastoiditis has been reported in the literature to be as high as 50%. The management of cutaneous mastoid fistulas can be difficult because the surrounding necrotic edges make primary closure difficult[6].

This case report describes an acquired fistula between the skin over the mastoid and the skin over the zygoma. To the best of our knowledge, this is the first report of such a fistula. A literature search using the PubMed, Ovid and Cochrane databases was conducted using the following keywords: fistula, mastoiditis, otitis media, abscess.

Case report

A 37-year-old female smoker attended as a tertiary referral complaining of a discharge from behind and in front of the right ear. The patient initially developed a swelling over the mastoid

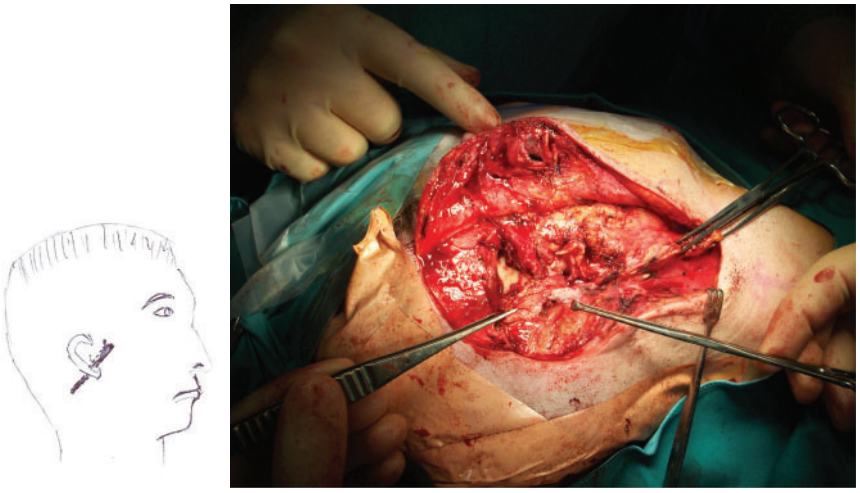

Fig. 1. The tract was traced from the skin over the mastoid process, superiorly to the EAC, and onto the skin over the zygoma.

with a diagnosis of acute mastoiditis and a subperiosteal abscess over a year previously, which was incised and drained (although there are no scans to confirm mastoiditis). Subsequently the patient developed recurrent discharging sinuses over the mastoid and zygoma which were treated with oral antibiotics. She was investigated with computed tomography (CT) and magnetic resonance imaging (MRI) scans. CT revealed lytic changes in the anterior right petrous bone also involving the temporomandibular joint (TMJ) fossa. An MRI scan showed soft tissue swelling and petrous bone destruction, with enhancement within the swollen right peri-auricular tissue around the TMJ and mastoid ear cells.

At exploration under anaesthesia, a Fisch type B incision was performed and the external auditory canal (EAC) was transected[7]. The tract was traced from the skin over the mastoid process, superiorly to the EAC, and onto the skin over the zygoma (Fig. 1). The fistula tract was excised in its entirety. A partial superior parotidectomy was required to identify the facial nerve branches, although the temporal branch had to be sacrificed because it was running through oedematous and infected tissue surrounding the fistulous tract. Cortical mastoidectomy revealed no middle ear pathology, although the tympanic membrane itself was retracted and myringosclerotic. Open exploration of the TMJ revealed only an osteophyte, with no obvious connection to the fistula. Microbiology reported no culture growth from specimens sent during surgery.

Radiology comments

An axial short time inversion recovery (STIR) study showed a T2 hyperintense tract (arrows) on the right, superior to the pinna (Fig. 2). Coronal T1 post-contrast showed a non-enhancing tubular structure adjacent to the right mastoid consistent with a tract (Fig. 3). An axial T1 post-contrast study showed a tubular non-enhancing abnormality consistent with a tract (Fig. 4).

Discussion

The head and neck develop from the branchial arches and pouches. First branchial arch derivatives are the incus, malleus, maxilla, zygoma, part of the temporal bone and the mandible. The first branchial pouch develops into the middle ear cavity and Eustachian tube. Branchial cleft anomalies represent a defect in the development of the neck area of the embryo. First branchial cleft anomalies are uncommon and typically present as pre-auricular sinuses or fistula. They may communicate with the external auditory meatus[8]. A first branchial cleft anomaly presenting as a post-auricular cyst has also been documented in the literature[9].

This case was unusual in that the fistula was cutaneo-cutaneous in nature extending as a single tract from the mastoid to the pre-auricular region. The fistula in this case may be a rare first branchial cleft anomaly. A CT scan of the head and neck has been reported to be a useful first-line investigation in establishing the diagnosis in such cases[10].

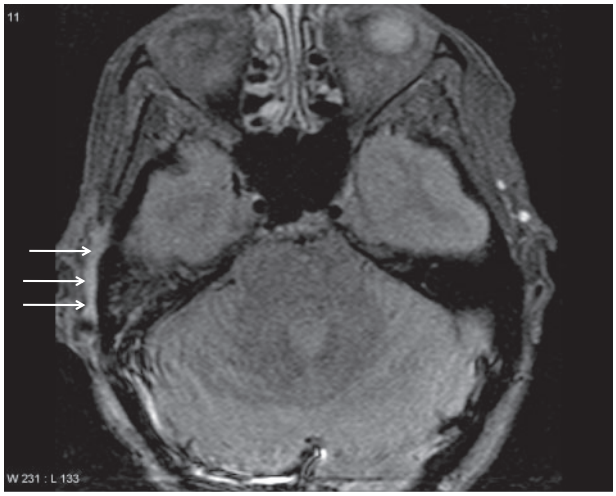

Fig. 2. STIR study showed a T2 hyperintense tract (arrows) on the right, superior to the pinna.

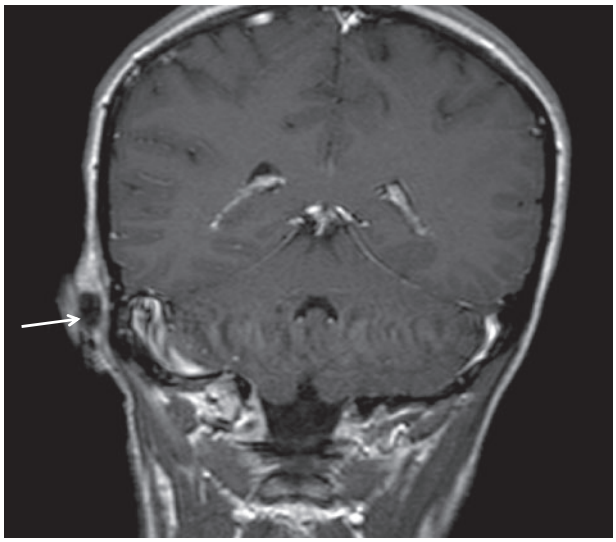

Fig. 3. Coronal T1 post-contrast showed a non-enhancing tubular structure adjacent to the right mastoid consistent with a tract.

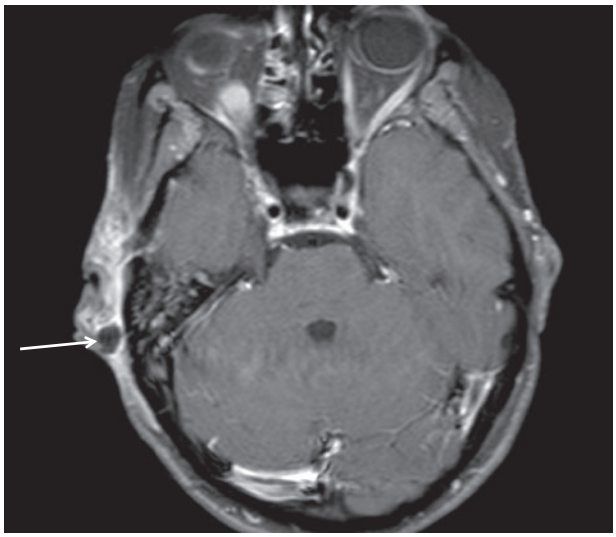

Fig. 4. An axial T1 post-contrast study showed a tubular non-enhancing abnormality consistent with a tract.

Teaching point

Any recurrent swellings, sinuses or cysts in the pre-auricular or post-auricular areas should alert a clinician to the possibility of branchial cleft anomalies. Early recognition of these highly unusual cases is paramount to prevent delay in diagnosis, treatment and complications.

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