

Acute Petrous Apicitis - A Case Report

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Abstract: *Petrous apicitis is a rare and potentially life-threatening condition and the incidence is reported to be approximately 2 per 100,000 children with acute otitis media (AOM)¹. They can produce a triad of retro-orbital pain, sixth cranial nerve paralysis, and otorrhea (Gradenigo's Syndrome) but only a minority of patients with petrous apicitis exhibit the full triad in the post-antibiotic era². Here we report a case of complete triad of Gradenigo Syndrome following AOM treated with minimal surgical intervention.*

Keywords: Petrous apicitis, AOM, Gradenigo Syndrome, conservative management

1. Introduction

The petrous apex represents one of the most surgically inaccessible areas of the skull base, so the diagnosis and management of lesions in this area are particularly challenging for Otorhinolaryngologists³.

The petrous apex is a pyramidal projection of bone that comprises the most medial portion of the temporal bone. The lateral base of this pyramid is defined by the inner ear, the eustachian tube, and the intratemporal carotid artery⁴. Otitis media is the most common bacterial infection in children. Complications became rare in the era of antibiotics but can be life-threatening^{5,6}. One of such complication is petrous apicitis (PA) which became an uncommon complication in the era of antibiotics and rarely affects children. Petrous apex infections can lead to cavernous sinus thrombosis, intracranial abscess, cranial nerve palsy and meningitis.

2. Case Report

10 year old girl was brought to ENT casualty with c/o left ear and eye pain for the past 3 days and double vision and left ear discharge for the past 2 days. She gave history of recent upper respiratory tract infection and intermittent left ear block for the past 1 month. On clinical examination, the child was afebrile and alert. Left ear canal was filled with mucoid discharge obscuring the view of tympanic membrane (TM), and mastoid was tender on palpation. Left lateral rectus palsy (**Fig.1**) noted with mild proptosis and normal vision. There were no symptoms of meningeal irritation or nystagmus and facial nerve function was normal bilaterally. All other ENT and systemic examinations were within normal limits. Blood investigations showed neutrophilic leucocytosis with elevated CRP and the ear discharge was sterile in culture.

Started on IV antibiotics (Meropenem and Vancomycin) and other supportive measures of intercellular septa and lateral wall of carotid canal. Proceeded with MRI Brain (**Fig.3**) and MRV, demonstrating post contrast enhancement of left mastoid and petrous apex, inflammatory dural thickening in

left Meckel's cave, mild osteomyelitic skull base inflammation in pterygoid plates and greater wing of sphenoid with a negligible collection in parapharyngeal space. No evidence of dural venous sinus thrombosis.



Figure 2: HRCT Temporal bone showing soft tissue density from left mastoid to petrous apex



Figure 1: Left LR palsy

Emergency HRCT Temporal Bone (**Fig.2**) was taken, soft tissue density noted in the left mastoid extending to petrous apex through postero-superior air cell tract with erosions

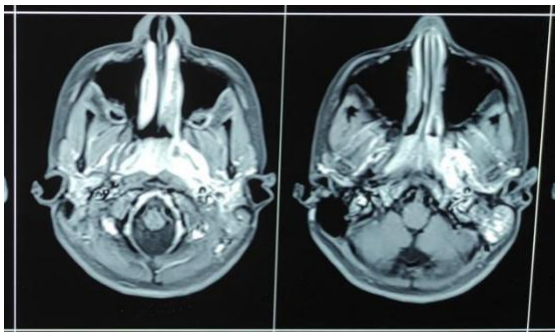


Figure 3: MRI Brain showing lesion in the left mastoid and petrous with osteomyelitis of pterygoid plates and sphenoid bone

Pure Tone Audiogram (PTA) showed left conductive hearing loss of 46dB. Left otoendoscopy done, congested TM with localised bulge seen (**Fig.4**) from where glue was draining, glue sent for culture & sensitivity, result came as sterile.



Figure 4: Left Otoendoscopic picture

The child underwent left mastoid exploration under GA. Intra-operatively cellular mastoid with glue filling entire mastoid and middle ear noted (**Fig.5**). Glue suctioned out, wash given and drainage obtained, Cortical Mastoidectomy completed. Post-operative period were uneventful and discharged on POD-9.



Figure 5: Left Cortical Mastoidectomy showing glue suctioning

On follow up there is complete resolution of lateral rectus palsy (**Fig.6**). Repeat PTA showed normal hearing. Otoendoscopy showed only grade 1 retraction of TM (**Fig.7**).

Repeat MRI imaging taken showed significant resolution of pathology (**Fig.8**) with minimal oedema in left petrous bone and mastoid.



Figure 6: Follow up -complete resolution of left lateral rectus palsy



Figure 7: Retracted TM on follow up, no signs of congestion or bulge

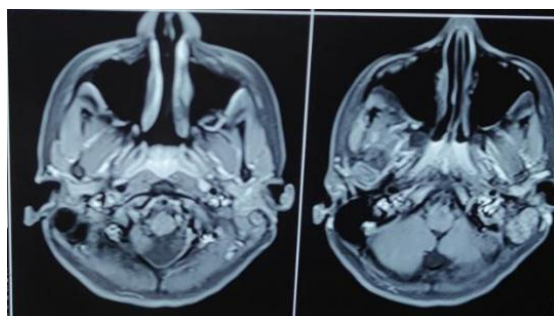


Figure 8: Repeat MRI Brain showing significant resolution of pathology

3. Discussion

Petrous apicitis is the inflammation of pneumatised spaces of petrous portion of temporal bone⁷. It is a rare complication of AOM with an incidence of 0.002%¹. The clinical features include deep orbital pain, ear discharge and diplopia together known as Gradenigo triad. Complete triad is uncommon in the post antibiotic era but present in our case.

In most individuals, petrous apex is poorly pneumatized, but when pneumatization does occur, air cells extend into the petrous pyramid in two main groups. A posterior group of cells that are in continuity with the mastoid antrum and epitympanum, that cluster around the semicircular canals at the base of the pyramid, and that extend medially to the petrous apex and an anterior group of cells that extends from the mesotympanum, hypotympanum, and protympanum and passes around the cochlea to the petrous apex⁷. In our case the infection spread through posterior air cell tract.

The anatomic complexities and the necessity to work around the labyrinth and the carotid artery make treatment of petrous apex air cell disease arduous task. A review of the English-language literature for Gradenigo Syndrome or petrous apicitis revealed only 48 publications concerning this condition, most in the otolaryngology press⁸.

Timely intervention may allow conservative management to succeed, avoiding the need for surgery. Acute petrous apicitis being a rare entity, high degree of suspicion is needed during clinical practise. Despite the fact that aggressive surgical techniques have historically been used to treat petrous apicitis, recent literature describes good results with more conservative medical treatment and minimal surgical intervention^{4,9,10}.

With this case report, we hope to highlight that even with rare and threatening complications of acute otitis media such as petrous apicitis, extensive surgical intervention like petrous apex approach surgeries is not always a necessity.

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