BioSCIENCE Case Report
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Surgical treatment of Gradenigo's syndrome

Tratamento cirúrgico da síndrome de Gradenigo

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PALAVRAS-CHAVE: Síndrome de Gradenigo. Paralisia do nervo abducente. Otite média aguda. Apicite petrosa. Petrosite.

INTRODUCTION

Gradenigo syndrome (GS) was first described by Guiseppe Gradenigo in 1907, and is characterized by the triad: otitis media complicated with otorrhea, facial pain in the trigeminal nerve region, and abducens nerve palsy.[1] This condition can be explained by the dissemination, by contiguity, of the middle ear infection to the apex of the petrous part of the temporal bone through aerated bone cells. In areas close to the petrous apex, passages of the abducens and trigeminal nerves are located, which can lead to paralysis and pain in the area of innervation of these.[2]

Diagnosis includes detailed history, thorough physical examination, and neurological evaluation. Imaging exams such as computed tomography and magnetic resonance imaging are essential for the differential diagnosis as well as to aid in therapeutic decision and surgical planning.

The treatment is still controversial. Most authors are in favor of early surgical intervention, while new reports have described satisfactory results with conservative treatment alone.

With the advent of potent antibiotics, complications of ear infections have become increasingly rare, and the incidence of GS has been decreasing. It is currently considered a rare but potentially fatal disease.

The objective of this article is to report a clinical case of GS as a complication of acute otitis media.

CASE REPORT

This report was approved by the Ethics Committee of the Hospital de Clínicas of the Federal University of Paraná - Curitiba, PR, Brazil - under opinion number 6.553.230.

A young 13-year-old boy presented with an initial clinical picture of severe frontal headache for about 1 month, evolving 2 weeks later with worsening of the headache associated with right otalgia, high fever and diplopia. He sought emergency medical attention and was referred to a tertiary service. On physical examination, the patient was in regular general condition, feverish, and presented paralysis of the 6th cranial nerve on the right. Other aspects of preserved extrinsic ocular mobility. Left otoscopy was within normal ranges, and the right showed an intact tympanic membrane, but bulging and hyperemic. He did not present phlogistic signs in mastoids or signs of peripheral facial paralysis. Computed tomography of the ears and mastoids and skull showed signs of acute otomastoidopathy on the right, complicated by collection involving the petrous apex and promoting regional osteolysis. There was also an association with asymmetric enhancement involving Meckel's cavum, Dorello's canal, and cavernous sinus on the right, which is probably reactional in nature. Based on the clinical and radiological findings, the diagnosis of Gradenigo syndrome was confirmed (Figures 1 and 2).

During hospitalization, ceftriaxone and metronidazole were initiated. The patient developed intolerance to metronidazole, which was replaced by clindamycin. On the 3rd day, with no improvement in the condition with clinical measurements, he underwent mastoidectomy and tympanotomy with placement of a ventilation tube on the right, a procedure performed without complications.

On the first postoperative day, he reported improvement in headache, and he still had diplopia and paralysis of the abducens nerve. After 14 days of hospitalization, he was discharged from the hospital with complete improvement of symptoms. There

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was total involution of the paralysis of the 6th cranial nerve on the right.

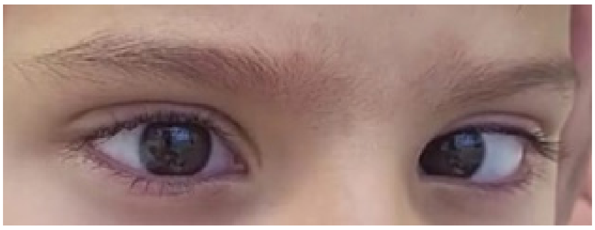

FIGURE 1 — Image of abducens nerve palsy on the right.

FIGURE 2 — Axial computed tomography scan demonstrating the involvement of the right temporal bone, including the petrous apex region (*).

DISCUSSION

The patient presented classic signs and symptoms of GS. However, studies show that only 13-42% of patients with petrous apicitis have the complete triad.[1,2]

Most cases result from acute otitis media and can be explained by the anatomy of the petrous portion of the temporal bone. The spread of the infection from the middle ear to the petrous apex occurs through aerated cells, which are found in 80% of people in the mastoid and in only 30% in the apex of the petrous part.[3] The apex is separated only by the dura mater of the ganglion of the trigeminal nerve and the canal of Dorello, through which the abducens nerve passes, making them more vulnerable to extradural inflammation in petrous apicitis. Retroorbital/facial pain is a result of trigeminal nerve involvement, and diplopia occurs due to involvement of the abducens nerve, which innervates the lateral rectus muscle. Cranial nerve involvement may take time to appear, occurring from 1 week to 3 months from the onset of otitis.[4]

Imaging studies are essential for the diagnosis of petrosal apex lesions, differential diagnoses, therapeutic decision, surgical planning, as well as confirmation or exclusion of intracranial complications. CT scan may show bone erosions and aerated cell opacification. MRI is useful for evaluating soft tissue injuries, and can provide more details, including the cause of the injury, nerve and meningeal involvement, possible underlying osteomyelitis, and neoplastic lesions.[5]

Possible intracranial complications include meningitis, intracranial abscess, or cavernous sinus thrombosis. In addition, it can affect other cranial nerves such as facial, trochlear, vestibulocochlear, vagus, oculomotor, glossopharyngeal, or accessory. Ophthalmologic complications such as papilledema, proptosis, and spread through the sympathetic plexus around the carotid artery leading to Horner's syndrome have also been described.[4]

There is no consensus in the literature regarding the treatment of GS. Because it is potentially fatal, most authors recommend early surgical intervention with tympanotomy with ventilation tube associated or not with surgical drainage of the mastoid. However, some recent studies have demonstrated success in conservative treatment with the use of broad-spectrum antibiotics, reserving surgical treatment for conditions refractory to conservative therapy or those with signs of a chronic process.[1]

Thus, it is believed that cases should be evaluated individually taking into account the clinical evolution and associated surgical risks. In this case, we opted for a combination of surgical intervention and antibiotic therapy, with significant improvement of all signs and symptoms.

Authors' contributions
José Fernando Polanski – Conceptualization, Writing (original draft)
Erika Yumi Nakagawa – Research, Methodology
Louise Ferreira Iunklaus – Methodology, Research
Arthur Ricardo Carminatti Ortinã – Investigation, Writing (original draft)
Carolina Rodrigues Laranjeira Vilar – Conceptualization, Methodology
Enzo Zanelato – Research, Conceptualization
Eduardo de Barros Sarolli – Supervision, Writing (original draft)

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