

Neuroimaging Highlight

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Altered Mental Status and a Retro-auricular Mass

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A 29-year-old woman was found lying unconscious in the shower. There was a two-day history of headache and dizziness. In the emergency room, she was initially stuporous (Glasgow Coma Scale 10/15), afebrile, bradycardic and hypertensive. She exhibited roving, conjugate eye movements, left facial paresis (including frontalis), left ptosis, diffuse hypotonia, extensor plantar responses bilaterally and a 1.5 cm warm, fluctuant mass with surrounding erythema behind the left ear (Figure 1). Otoscopy revealed a bulge in the posterior wall of the left external auditory canal.

A CT scan without contrast revealed an oval lesion with a hypodense centre and surrounding edema in the left cerebellar hemisphere, non-communicating hydrocephalus with com-

pression of the fourth ventricle, a right midline shift, and effacement of cisterns (Figure 2). There was a 1.5 cm area of complete erosion on the posterior aspect of the left temporal bone and rupture of the anterior wall of the petrous bone in the left middle fossa (Figure 3). Infused CT showed ring enhancement of the cerebellar lesion. The petrous bone appeared



Figure 1: 2.5 x 1.5 cm warm, erythematous, edematous post auricular mass.

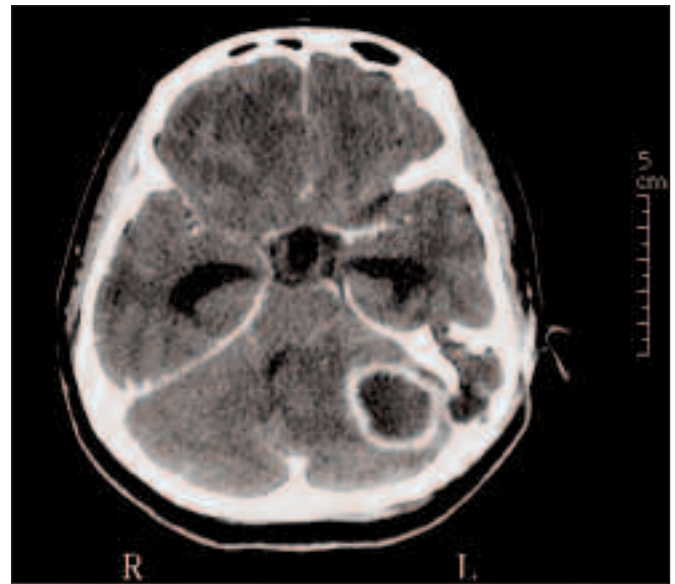


Figure 2: CT scan showing a left-sided ring enhancing abscess with surrounding edema causing a mass effect and displacement of the fourth ventricle and hydrocephalus with dilatation of the third ventricle and lateral horns. View also shows sigmoid sinus thrombosis as seen from the absence of enhancement in the area of the left sigmoid sinus.

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Figure 3: Bone window on CT scan showing erosion of the semicircular canals, cochlea, and labyrinthitis ossificans (sclerosis, likely longstanding) in the region of the lateral semicircular canals and cochlea. Scan also shows soft tissue completely expanding to fill the mastoid and erode through the petrous temporal bone (interrupted line).

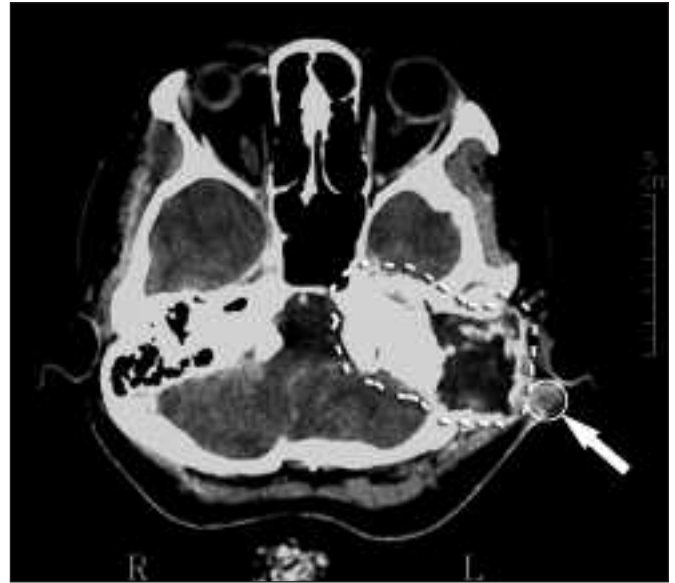


Figure 4: CT scan showing left subcutaneous nodule (solid line, white arrow), bony debris and complete destruction of the inner ear and mastoid with irregular opacification of these areas (interrupted line).

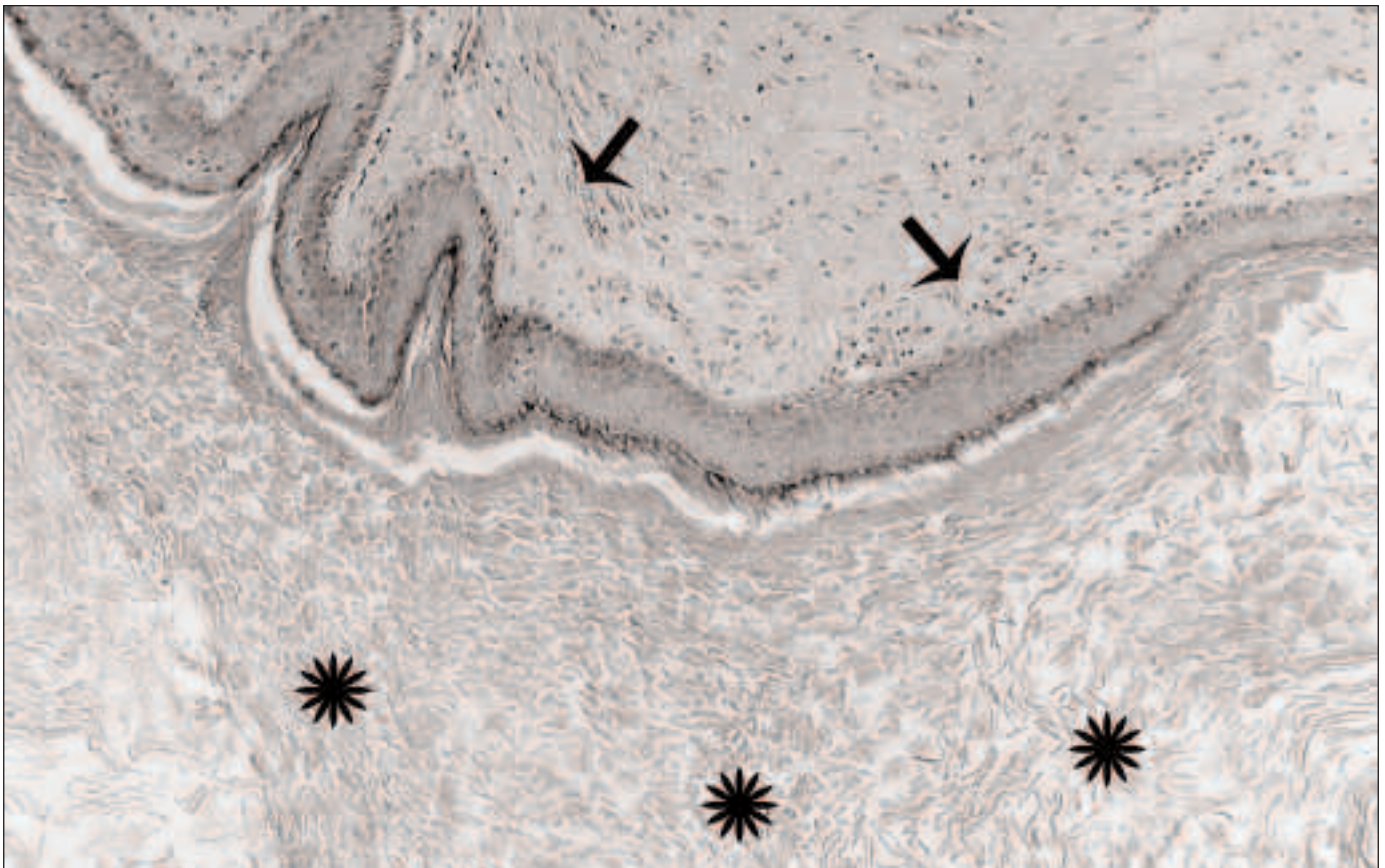


Figure 5: Histology of mass found in left ear. Hematoxylin & Eosin stain showing benign squamous cell lining epithelium (black arrows) and keratinous content (asterix) typical of a cholesteatoma.

hyperdense, and the left middle ear was destroyed by a mass extending into the external auditory canal (Figure 4). An occluded left maxillary sinus exhibited irregular enhancement. The impression was that of a left cerebellar abscess arising from left mastoiditis or inner ear infection complicated by obstructive hydrocephalus.

The patient was intubated and managed with intravenous mannitol and antibiotics. An external ventricular drain was inserted, the cerebellar abscess was resected and left total mastoidectomy was performed. Pathological evaluation of the mastoid tissue revealed cholesteatoma (Figure 5) with bacterial superinfection. Cultures of the post-auricular mass and cerebellar abscess grew *Proteus mirabilis*. There was gradual resolution of her suppressed mental status, left ptosis, aberrant eye movements, pathological reflexes and cerebellar dysfunction. A left facial palsy and conductive hearing loss persisted.

Intracranial complications of cholesteatoma are uncommon and include meningitis, venous sinus thrombosis, cranial nerve palsies, intracranial abscess and otitic hydrocephalus.¹ Extracranial complications include mastoiditis, subperiosteal abscess and Bezold's abscess, a deep soft tissue infection of the neck. Otogenic intracranial complications of chronic and acute otitis media include meningitis (35% of cases), extradural abscess (24%), lateral sinus thrombosis (18%), cerebral abscess (13%), cerebellar abscess (7%), hydrocephalus (2.8%) and cavernous sinus thrombosis (0.2%).² There are rare reports of obstructive hydrocephalus complicating cholesteatoma, some of which exhibit overlapping features with those of our patient.³⁻¹⁰ However, we are aware of no published cases of cholesteatoma presenting in an adult in conjunction with cerebellar abscess, acute obstructive hydrocephalus, hyporesponsiveness, hearing loss, facial paralysis, mastoiditis and a visible or palpable post-auricular mass. Superinfected cholesteatoma complicated by cerebellar abscess and acute obstructive hydrocephalus should be considered in the differential diagnosis of adult patients presenting with altered levels of consciousness and a retro-auricular mass.

REFERENCES

1. Munz M, Farmer JP, Auger L, O'Gorman AM, Schloss MD. Otitis media and CNS complications. *J Otolaryngol*. 1992; 21:224-6.
2. Kuczkowski J, Mikaszewski B, Starzynska A. Epidemiology of Otogenic intracranial complications treated at the Otolaryngology Department of Medical University of Gdansk in the years 1948-1996. In: Tos M, editor. Proceedings third international symposium on recent advances in otitis media Copenhagen 1-4 June, 1997, Kugler, Amsterdam, 1997.
3. Endo T, Su CC, Nakagawa A, Numagami Y, Jokura H, Shirane R, et al. [Recurrent cerebellar abscess secondary to middle ear cholesteatoma: case report]. *No Shinkei Geka - Neurological Surgery*. 2002; 30(4):431-5.
4. Clasen BP, Mahlo HW. [Internal occlusive hydrocephalus following cholesteatoma]. *HNO*. 1990; 38(9):345-7.
5. Lee GT. Otitic hydrocephalus. *Singapore Med J*. 1986; 27(1):77-9.
6. Kuczkowski J, Mikaszewski B. Intracranial complications of acute and chronic mastoiditis: report of two cases in children. *Int J Pediatr Otorhinolaryngol*. 2001; 60(3):227-37.
7. Aberbach A, Joachims HZ, Goldsher M. A neck mass as an unusual complication of aural cholesteatoma. *Ear Nose Throat J*. 1988; 67(10):780-1.
8. Hughes GB, Damiani KA, Kinney SE, Levine HL. Aural cholesteatoma presenting as a large neck mass. *Otolaryngol Head Neck Surg*. 1980; 88(1):34-6.
9. Moisa II, Danziger EJ, Brauer RJ. Subperiosteal and Bezold's abscesses complicating cholesteatoma: a case report. *Otolaryngol Head Neck Surg*. 1987; 97(4):399-402.
10. Furukawa K, Arai E, Kobayashi T, Takasaka T. [A case of Bezold's abscess associated with cholesteatoma]. *Nippon Jibiinkoka Gakkai Kaiho*. 1992; 95(12):1901-5.