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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/16636
DOI URL: <http://dx.doi.org/10.21474/IJAR01/16636>



RESEARCH ARTICLE

LABYRINTHINE FISTULA : A SEVERE COMPLICATION OF CHOLESTEATOMA

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Manuscript Info

Manuscript History

Received: 10 February 2023

Final Accepted: 14 March 2023

Published: April 2023

Key words:-

Labyrinthine, Fistula, Cholesteatoma,
Semicircular Canal

Abstract

The labyrinthine fistula is a severe complication of chronic otitis media with cholesteatoma. It is the consequence of a progressive erosion of the endochondral bone covering and closing the labyrinth by the cholesteatoma matrix. As the labyrinth is connected to the cochlea, a labyrinthine fistula can lead to sensorineural hearing loss in addition to vertigo. Computed tomography imaging of the petrous bones is systematic, specifying the seat and extension of the cholesteatoma, and evaluating the extent of bone lysis. We report the case of a young female patient who presents a chronic otitis media with cholesteatoma complicated by a labyrinthine fistula and a left temporal brain abscess.

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Introduction:-

Middle ear cholesteatoma is an inflammatory pseudotumor of epidermal type invading the cavities of the middle ear and presenting a double potential of desquamation on the surface and bone lysis in depth (1). Which can lead to a labyrinthine fistula, it most often affects the lateral semicircular canal. Symptoms and clinic examination are neither sensitive nor specific for the disease (2). Computerized Tomography scan (CT scan) performed in the preoperative assessment of cholesteatoma predicts a high suspicion of labyrinthine fistulas (3).

Casereport

18-year-old patient with a history of recurrent left-sided otorrhea that did not respond to treatment, without decreased hearing, vertigo or tinnitus, the evolution was marked by the occurrence of intense headaches with left-sided otalgia and visual disturbances. Physical examination was normal; the otological examination did not show any visible lesion in the pavilion or the external auditory canal. Complete head and neck physical examination was significant for cholesteatoma filling the right external auditory canal with moderate granulation tissue. A CT scan of the petrous bones was performed showing on the left a filling of the tympanic and mastoid cells. There was also a rupture of the tegmen antri, ossicular lysis, demineralization of the tympanic attic wall (Figure 1), as well as a rupture of the lateral semicircular canal wall related to a labyrinth fistula (Figure 2). On the right, the external auditory meatus showed a cerumen plug in its internal part with respect for the aerichypodensity of the eardrum, the antrum and the mastoid cells the ossicular chain was normal, as well as the tegmen, the wall of the cubicle and the anatomical elements of the inner ear. Cerebral CT scan showed the presence of a hypodense left temporal area, rounded, well limited, enhancing in the peripheral shell after contrast injection related with an abscess (figure 3). The patient was admitted to the neurosurgery department where she underwent drainage of the abscess followed by antibiotic therapy for one month and was then transferred to the otolaryngology department for management of chronic cholesteatomatous otitis media complicated with labyrinthine fistula

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Captions legends:

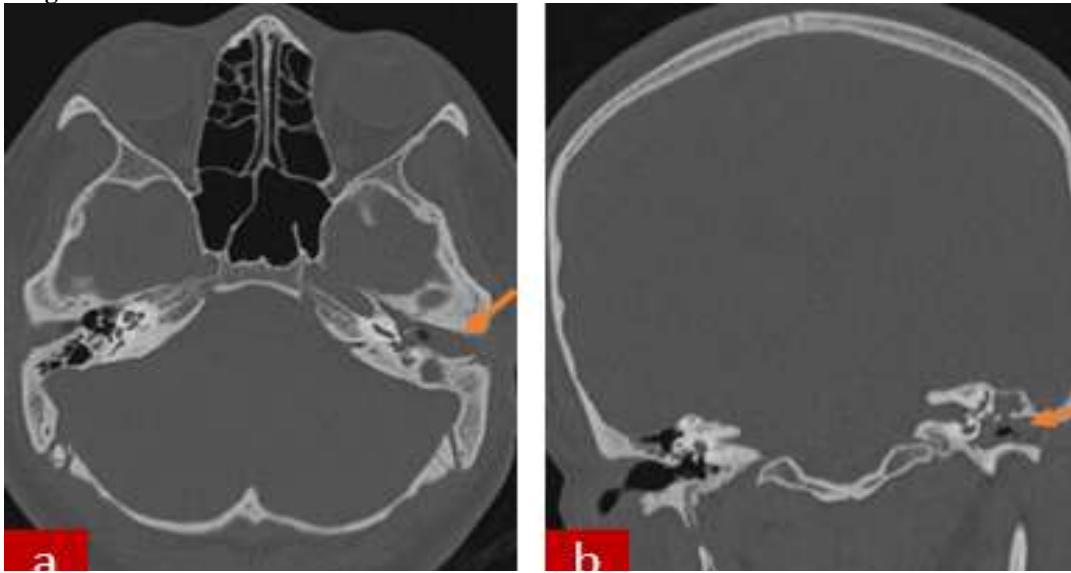


Figure 1:- Bone window CT scan of petrous bone in axial (a) and coronal (b) sections, showing a filling of the external auditory canal, tympanic cavity and mastoid cells with ossicularlysis.

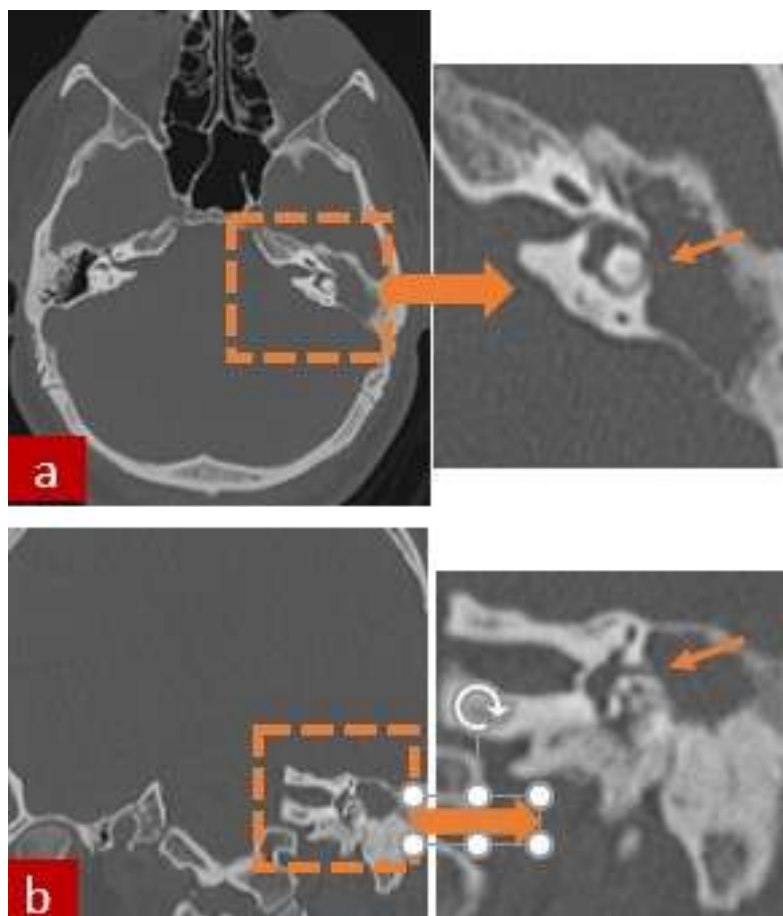


Figure 2:- Bone window CT scan of petrous bone in axial (a) and coronal (b) sections with zooming, showing rupture of the wall of the lateral semicircular canal : labyrinthine fistula.

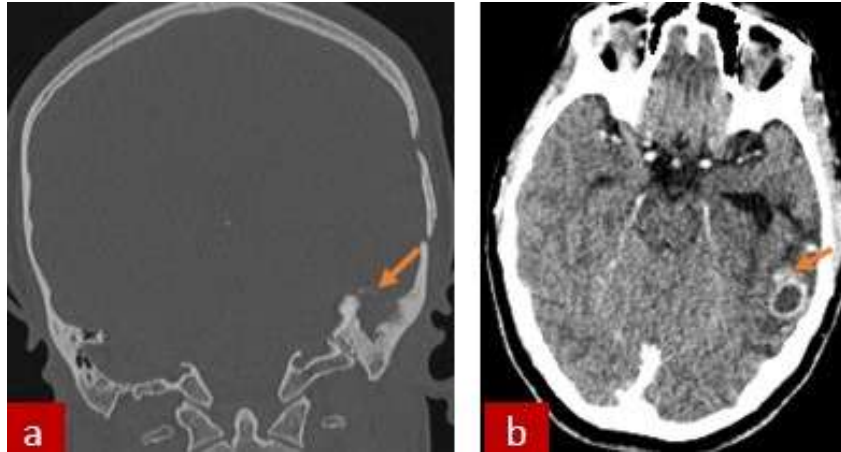


Figure 3:- Cerebral CT scan in coronal section, bone window (a) showing a filling of mastoid cells with rupture of tegmenantri. In brain window, axial section (b) there is a well-limited rounded left temporal lesion with annular enhancement after injection related to an abscess surrounded by a patch of edema.

Discussion:-

The labyrinthine fistula is a serious complication of chronic cholesteatomatous otitis media which results from a progressive erosion by the matrix of the cholesteatoma of the endochondral bone covering and closing the labyrinth (14), the cholesteatoma can lead to destruction of the cochleo-vestibular functions which can be complete or partial.(5) Labyrinthine fistula in chronic otitis media with cholesteatoma affect most often The horizontal semicircular canal (6). A classification was proposed by Palva and Johanson in 1986, classifying fistulas according to the severity of destruction of the otic capsule. (7). A more common classification of labyrinthine fistulas is based on the diameter of the fistula, reported in millimeters, which makes it possible to indicate which structures may be involved. For instance, a diameter of less than 2 mm is not likely to involve the endosteal membrane because the cholesteatoma matrix is still largely supported by the eroded edge of the bone. However, a fistula of more than 2 mm exposes more to a deep invasion. For clinical signs, half of the patients present vertigo, great rotatory vertigo is triggered by pressure on the tragus called « fistula sign or sign of Hennebert » which is a classic sign of the fistula, obtaining an acute vestibular syndrome due to pressure on the external acoustic meatus in case of labyrinthine fistula (8) but this sign is not sensitive and its found in the literature only in 22% to 53% of cases. (9) chronic otitis media with cholesteatoma may also cause intracranial complications such as meningitis, cerebral abscesses, subdural empyema and thrombophlebitis of the lateral sinus. In our case the patient presented a left temporal abscess drained. Computed tomography (CT) scan is now systematic in the preoperative assessment of cholesteatoma, to define the extent of the mass and the anatomy of the middle ear to rule out complications using millimetric incidences. In recent series, the sensitivity of the CT scan to detect labyrinthine fistula varies between approximately 85% to 100% (10)(11). Today, the preoperative high-resolution CT scan is a high performance tool for diagnosis of labyrinthine fistula. On the other hand, the CT scan does not allow to affirm with certainty that there is a perilymphatic fistula with rupture of the endosteum. The diagnosis of fistula can be made when the cholesteatomatous matrix is in direct apposition to the membranous portion of the labyrinth. The axial and coronal images should be carefully evaluated to demonstrate thinning of the cortex (12). In previous studies, MRI is not performed before the surgery of cholesteatoma with suspicion of labyrinthine fistula, but could be in future studies. The 3D-CISS sequence allows a preoperative evaluation of the integrity or invasion of membranous labyrinth. The 3D FLAIR reflects the inner ear dysfunction with labyrinthine fistulae, and predicts the functional prognosis better after the removal of cholesteatoma complicated by labyrinthine fistula.(13) Surgical management of a labyrinthine fistula in chronic otitis cholesteatomatosis by hydrodissection technique guarantees complete excision of the cholesteatomatous matrix which is the origin of the fistula (4) most authors favor total eradication of the cholesteatoma in one-stage surgery (14) to prevent the extension of bone resorption and the risk of suppurative labyrinthitis, except in very extensive or multiple fistulae. In some cases of extensive fistula, exclusion of lateral semicircular canal may be suggested. The location of labyrinthine fistula seems to have prognostic value for postoperative hearing. Thus, a cochlear or vestibular fistula which are rare would have a poorer prognosis than a semi-circular canal involvement, also the risk of hearing loss would be greater in the case of damage to the superior or posterior canal compared to damage of the external canal.(15,16)

Conclusion:-

Labyrinthine fistula is a severe complication of chronic otitis media with extended cholesteatoma and most commonly affects the lateral semicircular canal. High-resolution CT Scan is the method of choice for diagnosis with a sensitivity close to 100%, because there are no reliable preoperative symptoms of labyrinthine fistula, however, CT Scan cannot state with certainty a possible rupture of the endosteum which may compromise the functional prognosis. MRI investigation seems to be an interesting in this indication and should also be performed, with CT scan, in case of labyrinthine fistula complicating a cholesteatoma. Surgery with matrix excision is recommended except in special cases, it allows in more than 70% of cases to stabilize and improve bone conduction.

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