Delayed Intracranial Abscess after 3.5 Years of Acoustic Neuroma Surgical Removal

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Received 20 September 2013; Accepted 8 November 2013

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Abstract Brain abscess actually remains a threatening pathology despite of medical progress. A delayed brain abscess after an acoustic neuroma surgery by translabyrinthine approach is extremely rare in literature. We describe a case with petrous cavity and cerebellum abscesses by *Streptococcus milleri* that occurred 3.5 years after the surgical removal of an acoustic neuroma in an 11-year-old child. A high vigilance with a close monitoring and repeated imaging allows an appropriate decision for surgical intervention.

Keywords brain abscess; acoustic neuroma; translabyrinthine approach; *Streptococcus milleri*

1. Introduction

Surgical removal of acoustic neuroma (AN) remains one of several therapeutic modalities. Until now, a delayed brain abscess after an AN surgery by translabyrinthine approach is extremely rare in the literature [1]. The longest interval between the AN surgical removal and the occurrence of brain abscess was 16 months [4].

2. Case presentation

An 11-year-old child underwent a surgical removal by enlarged translabyrinthine approach of a left AN. The short-term postoperative evolution was marked by a subcutaneous cerebrospinal fluid collection at the operative site. It was rapidly resolved by a percutaneous puncture and compression bandage. However, he reported an occasional clear, odorless, water-like rhinorrhea of about some drops per day which disappeared spontaneously after some days. About 3.5 years later, he reported an apyretic, light headache, and a moderate pain of the left retroauricular scar after an episode of influenza. Neurologic and otologic findings revealed no anomaly. Blood and cerebrospinal fluid (CSF) analysis was also normal. Cerebral CT scanning demonstrated an aspecific filling of the left petrous cavity.

His clinical evolution rapidly deteriorated after 48 hours with signs of increased intracranial pressure without focal neurological deficit nor fever. A new blood analysis revealed an elevation of C-reactive protein and leukocyte count. Urgent cerebral CT scanning showed dilated intracranial ventricles associated with an abscess in the left petrous operated cavity (white arrow head) and a voluminous hypodense area without a well-defined ring in the left cerebella (black arrow head).

Figure 1: Cerebral CT scans after contrast infusion at the admission demonstrate a hypodense area with a well-defined ring in the left petrous operated cavity (white arrow head) and a voluminous hypodense area without a well-defined ring in the left cerebella (black arrow head).

On the 9th day, he deteriorated rapidly, presenting with an alteration of consciousness, marked somnolence,
lethargy, and stupor. Neurologic findings revealed an ataxia, nystagmus, unsteadiness and positional vertigo without focal neurological deficit. Cerebral CT scans showed a voluminous abscess in the left cerebellum with signs of brainstem compression. The evacuation of this abscess by a posterior fossa craniotomy approach was performed urgently.

Postoperatively, the evolution was favorable under a 6-week course of antibiotic treatment and a close monitoring with cerebral CT weekly until his discharge. The occlusion of left petrous cavity was realized at the end of antimicrobial therapy course. The latest control cerebral CT scanning revealed an absence of abscess after four years.

3. Discussion

Contiguous spread of ENT infections are the most frequent origin of brain abscess with a frequency ranging between 23% and 44% [3,5]. Among them, chronic supplicative otitis media is the most frequent otogenic etiology [2,3,5]. This intracranial complication was reduced over time thanks to early and effective management of ENT infections. The delayed brain abscess is an extremely rare complication of neurotologic intervention. To date, only two cases of delayed intracranial abscess after AN surgical removal were reported in the literature [4]. The longest interval between the surgery and the development of brain abscess is recorded as 16 months, while this complication occurred, in our case, 3.5 years after the surgery.

In our case, Streptococcus milleri was identified from samples aspirated during the surgery, whereas Staeecker et al. [4] related the identification of Pseudomonas aeruginosa. Streptococcus milleri is usually observed in brain abscesses of paranasal sinusitis or dental infection origin [3,5]. Until now, this germ, identified in brain abscess as otogenic origin, has not been reported in the literature. Indeed, Staphylococcus species or Pseudomonaceae are usually reported in postoperative brain abscesses whereas streptococcus species “non milleri” are frequently observed in brain otogenic origin abscesses [3,5]. Furthermore, the site of abscess could help to presume the source of intracranial extension and corresponding microorganisms. For example, abscesses of the temporal lobe or of cerebellar origin, usually develop from otogenic infection [3]. In our case, the localization of abscess and the microorganism identified did not correlate with frequently observed situations. Our hypothesis is that the microorganisms passed through the Eustachian tube (ET) and were a source of infection in the petrous cavity, which was obliterated with a combination of bone wax and abdominal fat 3.5 years ago during tumor removal. This occlusion may be defective over time, either spontaneously or by local infection (rhinopharyngitis) causing a re-permeability of the ET. The presence of rhinopharyngeal flora supports this hypothesis.

Absence of specificity of clinical and biological elements makes it difficult, in early detection, to diagnose and/or to distinguish brain abscess from other pathologies [3,5]. Imaging as CT or MRI play a major role in diagnostic and monitoring of brain abscess.

Treatment of brain abscess depends on its stage, clinical presentation, and imaging findings. In the early and late phases of cerebritis, antibiotic therapy alone with a close neurologic monitoring is recommended without surgery because the abscess is not well encapsulated [3]. Follow-up relies on clinical and biological assessments and on brain computed tomography scans, which must be frequently repeated during the first weeks of treatment.

The clinical deterioration on the 9th day in spite of the evacuation of the abscess on the 4th day may be explained by two different sites of abscesses (one in the left petrous cavity and the other in the cerebellum). The decision about the appropriate surgical approach with immediate surgical decompression should be performed for comatose patients or those with signs and symptoms suggestive of brain compression as our patient. The posterior fossa craniotomy with total excision of the abscess is traditionally recommended for cerebellar and brainstem abscesses [3]. Hence, a close monitoring plays an extremely important role in the management of brain abscess during the medical treatment phase.

4. Conclusion

Delayed brain abscess after AN removal is a serious and potentially lethal infectious complications which can occur in a very long term after the surgery. Early diagnosis using computed tomography and/or MRI, optimal timing of surgery, and appropriate use of antibiotics improved the outcomes. A high vigilance with a close monitoring and repeated imaging permits an appropriate decision for a surgical intervention.

Conflict of interest No potential conflict of interest relevant to this article was reported.

References


