

# Megadolicho basilar artery as a cause of asymmetrical sensorineural hearing loss - case report

## Dolicomega da artéria vértebro-basilar como causa de perda auditiva neurosensorial assimétrica - relato de caso

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### SUMMARY

**Introduction:** At the differentiated diagnosis of asymmetrical sensorineural hearing losses, vascular disorders are present, one of which is megadolicho basilar artery. This disease is generally asymptomatic, and when symptoms are found, they can be caused by a compression or ischemia. Clinically, sensorineural hearing loss, tinnitus, headache, facial hypoesthesia, trigeminal neuralgia, vertigo, diplopia and facial palsy, among others, are likely to occur. The image examination of choice for its diagnosis is nuclear magnetic resonance. The megadolicho basilar artery therapy can be surgical or conservative, according to the associated findings. A multidisciplinary approach, including a neurologist, neurosurgeon and an otorhinolaryngologist is recommended for a proper administration of the case.

**Objective:** Report the case of a patient with asymmetrical sensorineural hearing loss, diagnosed of megadolicho basilar artery.

**Case report:** JBS, 57-year-old white male with a history of asymmetrical sensorineural hearing loss and bilateral whistle-like tinnitus for several years. The otorhinolaryngologic evaluation, including otoscopy, anterior rhinoscopy and oral pharynx, was normal.

**Final Comments:** The treatment consisted in following up with the patient, controlling the tinnitus by drugs and using an individual sound amplification apparatus on the left ear.

**Keywords:** basilar artery, tinnitus, sensorineural hearing loss.

### RESUMO

**Introdução:** No diagnóstico diferencial das perdas sensorioneurais assimétricas fazem parte os distúrbios vasculares e dentre essas alterações encontra-se o dolicomega da artéria vértebro-basilar. Habitualmente essa doença é assintomática e quando há sintomas esses podem ser causados por compressão ou isquemia. Clinicamente podem ocorrer: perda neurosensorial, zumbido, cefaleia, hipoestesia facial, neuralgia trigeminal, vertigem, diplopia e paralisia facial entre outros. O exame de imagem de escolha para seu diagnóstico é a ressonância nuclear magnética. A terapia do dolicomega da artéria basilar pode ser intervencionista ou conservadora dependendo dos achados associados. A abordagem multidisciplinar incluindo neurologista, neurocirurgião e otorrinolaringologista para adequada condução do caso é recomendada.

**Objetivo:** Relatar o caso de um paciente com perda auditiva neurosensorial assimétrica cujo diagnóstico foi de dolicomega da artéria basilar.

**Relato do Caso:** JBS, 57 anos, sexo masculino, branco com história de hipoacusia neurosensorial assimétrica e zumbido tipo apito bilateral há vários anos. Exame otorrinolaringológico apresentando otoscopia, rinoscopia anterior e orofaringe normais.

**Comentários Finais:** O tratamento consistiu de acompanhamento do paciente, controle do zumbido com medicação e uso de um aparelho de amplificação sonora individual na orelha esquerda.

**Palavras-chave:** artéria basilar, zumbido, perda auditiva neurosensorial.

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## INTRODUCTION

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The findings of an asymmetrical sensorineural loss must always survey a group of diagnostic hypotheses, as well as the preparation of a clinical thinking to investigate the several apparent causes. Retrocochlear diseases are an integral part of the differentiated diagnosis of sensorineural hearing losses, such as: acoustic neuroma, brain cancer, congenital intradural epidermoid cysts, nonacoustic posterior fossa schwannomas, vertebrobasilar dolichoectasias, aneurysms, arteriovenous malformations, lipomas, hemangiomas and osteomas (1,2).

When investigating these cases, the following exams can be requested in the form of an evaluation: study of brainstem auditory evoked potentials (BAEP) and nuclear magnetic resonance (NMR) (3). In literature, some authors are choosing to perform BAEP firstly and, subsequently, in suggested cases of retrocochlear disease, NMR. Another tendency indicates NMR as a selection exam, since there are false-negative cases when performing BAEP. Accordingly, a decrease in the cost caused by an initial BAEP screening would not compensate for the late diagnosis of these affections and likely complications thereof.

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## CASE REPORT

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JBS, 57-year-old white male, showing a history of hearing loss and bilaterally-whistling tinnitus for a number of years. Otorhinolaryngological exam shows regular otoscopy, anterior rhinoscopy and oropharynx. Preceding masonic schistosomiasis diagnosed 12 years earlier, confirmed by a positive parasitological feces exam in two samples for *Schistosoma mansoni*. Other co-morbidities are denied. Tone and vocal audiometries have been performed and showed an asymmetrical hearing loss (Right ear: 500 Hz - 40 dB; 1000 Hz - 35 dB; 2000 Hz - 40 dB; 3000Hz - 40 dB; 4000 Hz - 35 dB; 8000 Hz - 50 dB. Left ear: 500 Hz - 65 dB; 1000 Hz - 65 dB; 2000 Hz - 70 dB; 3000Hz - 75 dB; 4000 Hz - 75 dB; 8000 Hz - 85 dB). A nuclear magnetic resonance was requested and showed a vertebrobasilar dolichoectasia and sinuosity to the left, protruding to the cerebellopontine angle in the posterior fossa, touching the ventral emergency portion of the 7<sup>th</sup> and 8<sup>th</sup> cranial pairs. Based on findings, it was diagnosed as vertebrobasilar dolichoectasia, and the neurosurgical evaluation was requested and rejected a likely surgical treatment, taking into consideration the topography of the lesion (high morbimortality) and intensity of symptoms. The selected procedure was to follow up with the case and prescribe clonazepam at a dose of 0.5 mg/day. Using an individual sound-amplification apparatus on the left ear was indicated.

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## DISCUSSION

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Vascular disorders are an integral part of the differentiated diagnosis of sensorineural asymmetrical hearing losses, among which there is a rare entity called vertebrobasilar dolichoectasia. Dolichoectasia is usually asymptomatic, however when symptoms are present, they can be caused by a compression or ischemia (4). Clinically, the following symptoms may occur: sensorineural hearing loss (however rare as an isolated symptom), tinnitus, headache, facial hypesthesia, trigeminal neuralgia, vertigo, diplopia and facial palsy, among others (5-9). In the studied case, the symptoms were moderate sensorineural hearing loss in the left ear together with a bilateral tinnitus, with no further signals or symptoms. The image exam of choice to reach a diagnosis is the nuclear magnetic resonance, which can demonstrate sinuosity, stenosis, thrombosis or dolichoectasia (10). At NMR, the patient showed a vertebrobasilar dolichoectasia. It was protruding to the cerebellopontine angle in the posterior fossa, and it was very close to the emergence of the facial and vestibule-cochlear nerves. There is a correlation between symptomatology and the findings of image exams. When only sinuosity is found without a dilatation, it is more likely to impair a cranial pair; yet, if a significant arterial dilatation is present, multiple impairments can occur with severe neurological deficits (11). At the time of diagnosis, this patient had neither an impairment of any cranial pairs other than the vestibulo-cochlear one nor associated neurological lesions. Occasionally, oligosymptomatic patients with slight hearing losses can be found, although having stressed dimension lesions. In 1986, NISHIZAKI et al surveyed 23 cases of vertebrobasilar dolichoectasia in a retrospective 10-year study, and they found pontine infarction (30%), vertebrobasilar insufficiency and facial spasm (17%), transient ischemic attack and cerebellar hemorrhage (4%) (12). The work implies that vertebrobasilar dolichoectasia is associated with brain ischemia and a prophylactic therapy against ischemic cerebrovascular accident would be indicated, even in asymptomatic cases. Nevertheless, the mechanical compression isolated by big-dimension dolichoectasia has been found to cause hearing loss without an association with the brainstem infarction (13). This finding looks similar to that found in the studied patient, since neither thrombosis nor atherosclerosis was found in the vertebrobasilar system, which would justify the described hearing loss. The hearing loss is also likely associated with a vestibular impairment, causing vertigo, visual disorders and oscillopsia associated with head movements and walking. These symptoms, however, were not found in the described patient. The vertebrobasilar dolichoectasia therapy will be surgical or conservative, according to the associated findings. Surgery can be hazardous because of the risk of causing a lesion in the small vases originated in the basilar artery, provoking

a vascular accident. Conversely, the therapy with platelet antiaggregants can be one of the strategies taken to decrease the likelihood of arterial thrombosis (14). It is essential to have a multidisciplinary approach including a neurologist, neurosurgeon and an otorhinolaryngologist, with a view to properly managing the case, since there is a wide range of clinical presentations of this disease, whose treatments of choice are still controversial (15).

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## CONCLUSION

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In cases of asymmetric sensorineural hearing loss with or without tinnitus, the differentiated diagnosis must be integrated by vascular-derived diseases, one of which is vertebrobasilar dolichoectasia, whose diagnosis will only be given after a proper investigation is performed.

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