

## Images of Interest / Imagens de Interesse

**Cholesteatoma of the External Auditory Canal: A Common Entity at a Rare Site***Colesteatoma do Canal Auditivo Externo: Entidade Comum num Local Raro*João Vieira<sup>1</sup>, Marta Silva<sup>1</sup>, Sofia Dutra<sup>1</sup>, Paula Carneiro<sup>1</sup>, Pedro Cordeiro<sup>1</sup><sup>1</sup>Hospital do Divino Espírito Santo de Ponta Delgada EPE, Ponta Delgada, Portugal

## Address

João Vieira  
 Serviço de Radiologia  
 Hospital do Divino Espírito Santo  
 Avenida Dom Manuel I  
 9500-370 Ponta Delgada, Portugal  
 e-mail: joaopsvieira@gmail.com

Received: 02/06/2024

Accepted: 20/07/2024

Published: 31/08/2025



## Abstract

External auditory canal cholesteatoma is a rare entity when compared with the middle ear cholesteatoma. Despite the rarity, the radiologist should be aware of the main imaging findings for the differential's diagnosis and how to stage the lesion for the correct surgical management.

This article describes a 51-year-old male patient with progressive right ear dull pain and hearing loss. In this context, a plain high-resolution temporal bone computed tomography scan was obtained, showing a well-defined soft tissue attenuating lesion in the external auditory canal with bone wall erosions and small bone flecks inside the lesion.

The patient was submitted to a canaloplasty, which confirmed the diagnosis.

## Keywords

Cholesteatoma; Middle ear; Ear canal; Hearing loss; Tomography.

## Resumo

O colesteatoma do canal auditivo externo é uma entidade rara quando é comparada com o colesteatoma do ouvido médio. Embora a raridade da lesão, o radiologista deverá estar atento aos principais achados imagiológicos de forma a definir corretamente os diagnósticos diferenciais e realizar o correto estadiamento, o qual tem implicação no tratamento cirúrgico do paciente.

Apresentamos um artigo que detalha a história de um homem com 51 anos que descrevia dor progressiva no ouvido direito e perda auditiva. Neste contexto, realizou uma tomografia computadorizada de alta resolução focando o osso temporal direito, demonstrando uma lesão de tecidos moles no canal auditivo externo, com erosões ósseas da parede e pequenos fragmentos ósseos no seu interior.

O paciente foi submetido a canaloplastia, tendo sido confirmado o diagnóstico de colesteatoma do canal auditivo externo.

## Palavras-chave

Colesteatoma; Ouvido médio; Canal auditivo; Perda auditiva; Tomografia.

## Case Report

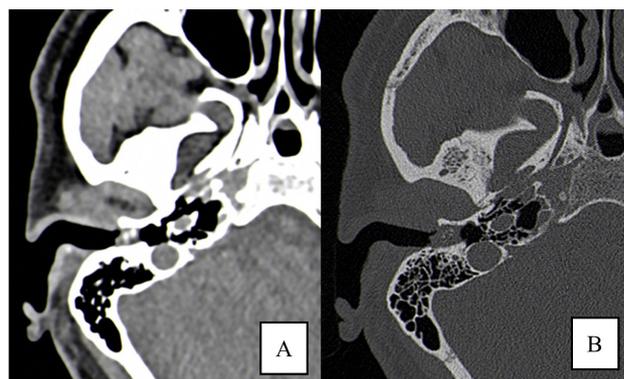
A 51-year-old immunocompetent man presented with one-year history of progressive right ear dull pain and hearing loss. The patient reported no history of previous head trauma, surgery or radiation.

A plain high-resolution temporal bone computed tomography (CT) scan was obtained. A unilateral soft tissue attenuating lesion was present in the posterior-inferior aspect of the right external auditory canal (EAC). Using the bone window setting, it was possible to visualise an area of focal bone erosion of the EAC associated with small bone flecks sequestered within the mass. It is important to note the facial nerve canal and mastoid cells were preserved.

The patient was successfully submitted to a canaloplasty, removing the lesion.(Fig. 1)

## Discussion

An EAC cholesteatoma is an inflammatory lesion containing defoliating keratin lined by keratinized stratified squamous epithelium with associated periostitis and bone erosion. Such lesion is rare compared to the middle ear cholesteatoma, with an overall incidence rate of 0.30 per year per 100,000 inhabitants.<sup>1</sup>



**Figure 1** – (A) High-resolution CT of temporal bone in axial section depicts a lesion of the right EAC on the soft tissue window setting. (B) High-resolution CT of temporal bone in axial section depicts a lesion of the right EAC on a narrowed window width setting. There is erosion of posterior wall and bony sequestrum within the lesion.

Cholesteatoma can be classified according to aetiology as idiopathic and secondary forms (poststenotic, posttraumatic, postinflammatory, radiogenic, postobstructive, and posttumorous). The idiopathic form usually presents on the floor of the EAC, whereas the secondary form can occur in any other aspect of the canal.<sup>2</sup>

The clinical presentation is usually an elderly man with otorrhea and chronic dull pain. Conductive hearing loss is usually minimal.<sup>1</sup>

Radiological evaluation followed by surgical confirmation leads to correct diagnosis and staging. High-resolution temporal bone CT scan is the imaging modality of choice when cholesteatoma is clinically suspected.<sup>3</sup>

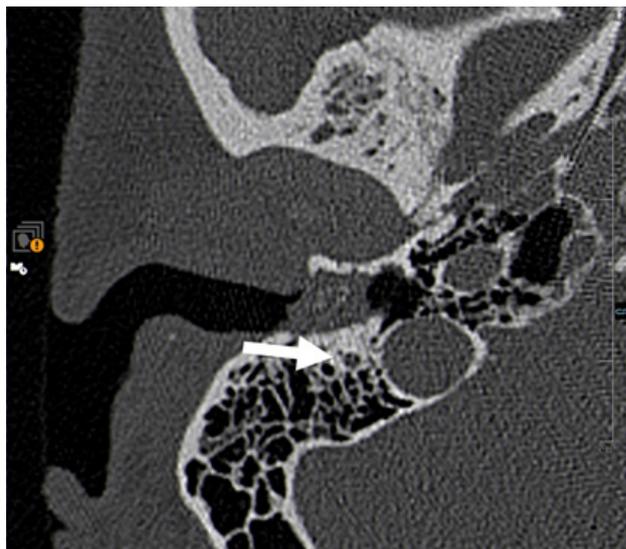
EAC cholesteatoma presents on CT as a sharply margined expansile soft tissue attenuating lesion with bone erosions and small bone flecks within the lesion. These bone flecks are better visualized in narrow window width settings (Fig. 2).<sup>3</sup>



**Figure 2** – Coronal temporal bone CT image shows an EAC cholesteatoma as a soft-tissue mass in the inferior EAC, with associated erosion of the subjacent bone and small bone flecks inside the lesion.

In this case, the middle ear cavity and the facial nerve canal are uninvolved (3mm distance) and is classified as Stage I according to the CT classification system of Shin et al. (stage I - cholesteatoma of the EAC only; stage II: invasion of the tympanic membrane and the middle ear; stage III: involvement of the mastoid air cells; stage IV: lesions beyond the temporal bone).<sup>3</sup>

The management of the EAC cholesteatoma depends on the extent of the lesion, which should be assessed by CT. Canaloplasty is indicated for stage I lesions and it was performed in our case. Advanced stages may require a more radical approach with mastoidectomy or petrosectomy (Fig. 3).<sup>3</sup>



**Figure 3** – High-resolution CT of temporal bone in axial section depicts a lesion of the right EAC. Note the posterior bone erosion, without involvement of the mastoid air cells or the facial nerve canal (arrow).

Other differential diagnoses include inflammatory, infective (malignant otitis externa), and neoplastic processes (squamous cell carcinoma). The keratosis obturans (KO) is the most closely related condition and difficult to distinguish based only on otoscopic examination. However, KO presents as a soft tissue plug in the bilateral EACs, without focal bone erosion of the canals.<sup>4</sup>

In summary, the radiologist should be aware of the main clues to the diagnosis such as the presence of a well-defined soft tissue attenuating lesion in the EAC with bone wall erosions and small bone flecks inside the lesion being the main CT features of EAC cholesteatoma.

#### Ethical Disclosures / Divulgações Éticas

*Conflicts of interest:* The authors have no conflicts of interest to declare.

*Conflitos de interesse:* Os autores declaram não possuir conflitos de interesse.

*Financing Support:* This work has not received any contribution, grant or scholarship.

*Supporte financeira:* O presente trabalho não foi suportado por nenhum subsídio ou bolsa.

*Confidentiality of data:* The authors declare that they have followed the protocols of their work center on the publication of data from patients.

*Confidencialidade dos dados:* Os autores declaram ter seguido os protocolos do seu centro de trabalho acerca da publicação dos dados de doentes.

*Protection of human and animal subjects:* The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

*Proteção de pessoas e animais:* Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pelos responsáveis da Comissão de Investigação Clínica e Ética e de acordo com a Declaração de Helsínquia da Associação Médica Mundial.

#### References

1. Owen HH, Rosborg J, Gaihede M. Cholesteatoma of the external ear canal: etiological factors, symptoms and clinical findings in a series of 48 cases. *BMC Ear Nose Throat Disord.* 2006;6:16.
2. Dubach P, Hausler R. External auditory canal cholesteatoma: reassessment of and amendments to its categorization, pathogenesis, and treatment in 34 patients. *Otol Neurotol.* 2008;29:941-8.
3. Chawla A, Ezhil Bosco JI, Lim TC, Shenoy JN, Krishnan V. Computed tomography features of external auditory canal cholesteatoma: a pictorial review. *Curr Probl Diagn Radiol.* 2015;44:511-6.
4. Heilbrunn ME, Salzman KL, Glastonbury CM, Harnsberger HR, Kennedy RJ, Shelton C. External auditory canal cholesteatoma: clinical and imaging spectrum. *AJNR Am J Neuroradiol.* 2003;24:751-6.