

Mycotic Aneurysm of the Cervical Internal Carotid Artery: A Rare Complication of Chronic Cholesteatomatous Otomastoiditis

Dr Dhamnia*, Dr Benkaddour, Dr Nassar and Dr Imrani

Department of Radiology, CHU Avicenne, Rabat, Morocco

***Corresponding Author:** Dr Dhamnia, Department of Radiology, CHU Avicenne, Rabat, Morocco.

Received: June 29, 2026; **Published:** July 24, 2026

Abstract

Mycotic aneurysms of the internal carotid artery are rare but potentially life threatening vascular complications, most often related to systemic infection, septic emboli, or direct extension from adjacent infectious processes. Cervical involvement of the internal carotid artery is particularly uncommon, and cases secondary to chronic cholesteatomatous otomastoiditis remain exceptionally rare. Early diagnosis is essential because these lesions carry a high risk of rupture, thromboembolism, and neurological deterioration.

We report the case of a 60 year old male presenting with acute pulsatile cervical swelling and headache in the setting of long standing untreated chronic otomastoiditis with recurrent otorrhea. Clinical examination revealed lower cranial nerve involvement and biological tests demonstrated significant inflammatory syndrome. Computed tomography of the temporal bone showed extensive mastoid destruction with erosion of the carotid canal. CT angiography of the neck demonstrated a saccular aneurysmal dilation of the cervical segment of the internal carotid artery with irregular contours and surrounding inflammatory tissue. Magnetic resonance imaging confirmed the aneurysm and identified an associated cholesteatomatous lesion with adjacent dural thickening, without evidence of cerebral ischemia or venous thrombosis.

The diagnosis of mycotic aneurysm of the cervical internal carotid artery secondary to chronic cholesteatomatous automastoiditis was established based on imaging findings and clinical context. The patient was managed with broad spectrum intravenous antibiotics and referred for endovascular treatment. During the procedure, neurological deterioration occurred following guidewire placement, leading to discontinuation of the intervention. Despite supportive management, the patient experienced rapid clinical deterioration and died a few hours later.

Mycotic aneurysms of the cervical internal carotid artery remain extremely rare, with most data derived from isolated case reports and small series. Chronic otomastoiditis with cholesteatoma represents an unusual but important cause through local bone erosion and direct vascular wall infection. Radiological imaging plays a central role in early detection, assessment of complications, and therapeutic planning. Multimodality imaging including CT, CT angiography, and MRI is essential to evaluate vascular involvement, inflammatory extension, and associated intracranial complications.

This case highlights the importance of considering vascular complications in advanced otomastoiditis and underscores the need for rapid multidisciplinary management. Early recognition may improve outcomes and prevent catastrophic complications in this rare but potentially fatal condition.

Keywords: *Mycotic Aneurysm; Internal Carotid Artery; Automastoiditis; Cholesteatoma; Osteolysis; Cervical ICA*

Introduction

Mycotic aneurysms of the internal carotid artery are rare but potentially life-threatening vascular lesions. These aneurysms typically develop secondary to bacteremia, septic emboli, or direct extension of adjacent infectious processes. Cervical involvement of the internal carotid artery is particularly uncommon, and most available data originate from isolated case reports and small case series.

Recent literature emphasizes the rarity of this condition. A literature review by de Boer, *et al.* identified 48 cases of mycotic internal carotid artery aneurysms reported across 38 publications. Similarly, Hanger and Baker reported that the internal carotid artery represented 47.4 percent of infective extracranial carotid artery aneurysms. Earlier studies estimated approximately 100 cases reported over several decades, highlighting the exceptional nature of this pathology [1-3].

Among rare etiologies, chronic cholesteatomatous otomastoiditis may cause direct extension of infection to adjacent vascular structures through progressive bone erosion. This mechanism may lead to infection of the arterial wall and subsequent aneurysmal dilation.

Early recognition is crucial because mycotic aneurysms carry a high risk of rupture, thromboembolism, and neurological complications.

This study reports a rare case of cervical internal carotid artery mycotic aneurysm secondary to chronic cholesteatomatous otomastoiditis and highlights the importance of multimodal imaging in diagnosis and management.

Case Presentation

This study presents a single case report of a 60 years old male patient presenting with pulsatile cervical swelling.

Clinical evaluation included neurological examination, otoscopic examination, and laboratory analysis of inflammatory markers.

Radiological evaluation included:

- Temporal bone computed tomography.
- CT angiography of the neck.
- Magnetic resonance imaging with contrast.
- Diffusion weighted imaging sequences.

Imaging analysis focused on identifying:

- Bone destruction.
- Vascular abnormalities.
- Infectious lesions.
- Intracranial complications.

The diagnosis was established based on clinical, biological, and radiological correlation.

Results and Discussion

A 60 years old male presented with acute pulsatile cervical swelling associated with headache. The patient had a history of untreated chronic otomastoiditis with recurrent otorrhea.

Neurological examination revealed lower cranial nerve paresis without focal motor deficit. Laboratory findings showed elevated inflammatory markers including leukocytosis and increased C reactive protein.

Temporal bone CT demonstrated extensive destruction of mastoid air cells with erosion of the carotid canal.

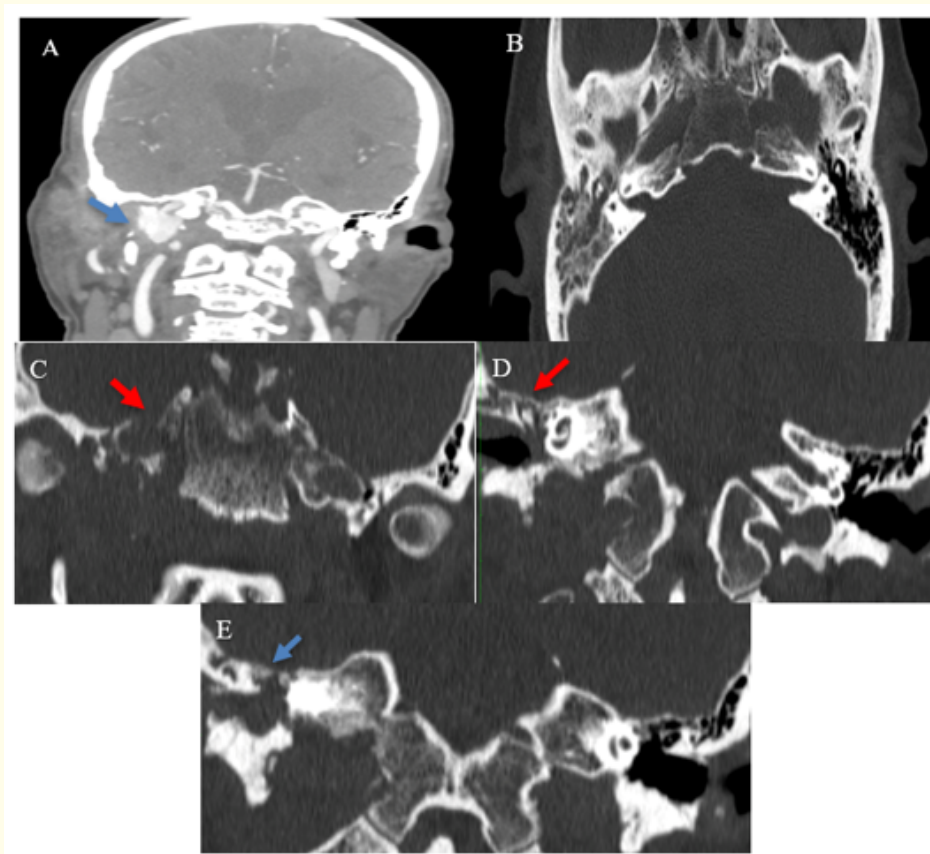


Figure 1: CT images of the temporal bone and carotid artery.

A: Coronal contrast-enhanced CT angiography in the arterial phase showing a saccular aneurysm (blue arrow) with irregular contours involving the cervical segment of the right internal carotid artery, just inferior to its entry into the petrous canal.

B: Axial. C: Coronal non-contrast CT image (Bone window) showing opacification of the right mastoid air cells and middle ear cavity.

C: Coronal non-contrast CT image (Bone window) Erosion of the proximal carotid canal, (Red arrow) consistent with osteolysis secondary to chronic otomastoiditis.

C and D: Coronal non-contrast CT image (Bone window): Additional bony defects were observed at the level of the tegmen tympani (Red arrow) and tegmen antri (Blue arrow).

CT angiography of the neck revealed a saccular aneurysmal dilation involving the cervical segment of the internal carotid artery with irregular contours and surrounding inflammatory tissue.

MRI confirmed the aneurysm and demonstrated an associated cholesteatomatous lesion with diffusion restriction and adjacent dural thickening.

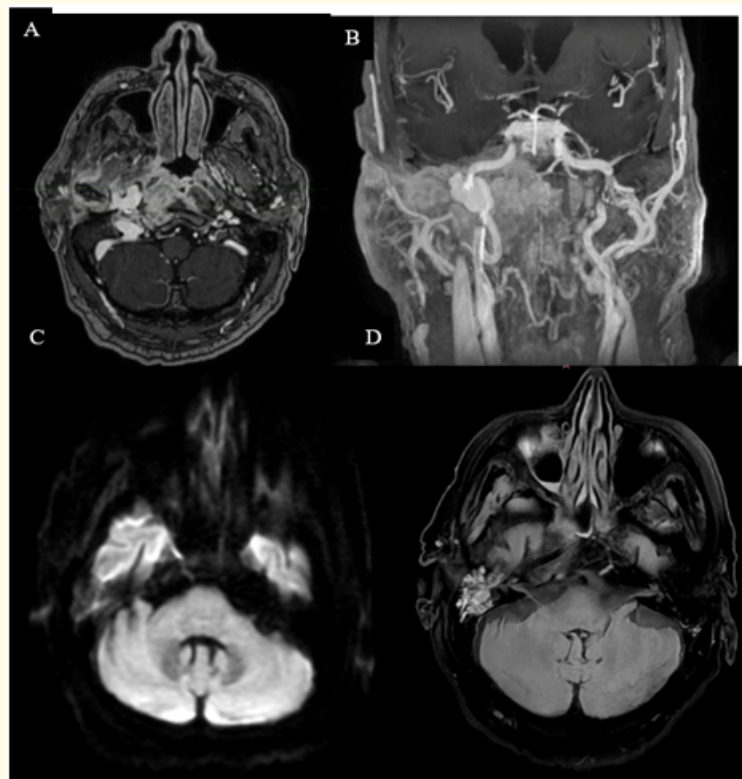


Figure 2: MRI characterization of the aneurysm and middle ear cholesteatoma.

- A: Axial contrast-enhanced fat-saturated T1-weighted image (Arterial phase) confirming the presence of a saccular aneurysm with irregular margins in the cervical portion of the right internal carotid artery (Arrow).*
- B: Coronal contrast-enhanced fat-saturated T1-weighted image (MIP reconstruction) showing the same aneurysm, located just below the petrous entry point of the carotid artery (Arrow).*
- C: Axial diffusion-weighted imaging (DWI) sequence revealing marked diffusion restriction within the right middle ear cavity, consistent with a cholesteatomatous lesion.*
- D: Axial T2-weighted FLAIR image showing a corresponding hyperintense signal in the right middle ear, further supporting the diagnosis of a cholesteatoma.*

No evidence of cerebral infarction or cavernous sinus thrombosis was identified.

A diagnosis of mycotic aneurysm of the cervical internal carotid artery secondary to cholesteatomatous otomastoiditis was established.

Mycotic aneurysms result from infection of the arterial wall leading to weakening and progressive aneurysmal dilation. These lesions carry a high risk of rupture, embolization, and neurological complications.

Cholesteatomatous otomastoiditis is a destructive middle ear disease characterized by keratinizing epithelium, chronic infection, and progressive bone resorption. In advanced cases, infection may extend to adjacent vascular structures including the internal carotid artery through bone erosion.

Radiological imaging plays a central role in early diagnosis. CT and MRI allow identification of:

- Saccular aneurysm.
- Vessel wall irregularity.
- Perivascular inflammatory changes.
- Bone erosion.
- Associated abscess formation.

Prompt multidisciplinary management is required including antibiotics and vascular intervention. Treatment options include endovascular exclusion or surgical repair depending on anatomical considerations and clinical status [4-7].

In the present case, broad spectrum intravenous antibiotics were initiated and endovascular management was attempted. However, neurological deterioration occurred during the procedure, leading to discontinuation of the intervention. The patient subsequently deteriorated and died a few hours later.

This case highlights the severity of this rare complication and emphasizes the importance of early diagnosis and multidisciplinary management.

Conclusion

Mycotic aneurysm of the cervical internal carotid artery is an extremely rare but life-threatening complication of chronic cholesteatomatous otomastoiditis. Multimodal imaging including CT, CT angiography, and MRI plays a crucial role in diagnosis and therapeutic planning. Early recognition and multidisciplinary management are essential to improve patient outcomes and prevent catastrophic complications.

Conflict of Interest

The authors declare no conflict of interest.

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Volume 9 Issue 4 August 2026

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