Turkish Archives of Otorhinolaryngology

Case Report

Turk Arch Otorhinolaryngol
DOI: 10.4274/tao.2026.2025-12-10

Otorrhagia in Chronic Otitis Media: An Unexpected Presentation of Internal Carotid Artery Rupture

Alina Martín Fernandes[1], Guilherme Marques Rios[1], Filipa Armada Ferreira[1], Daniela Ribeiro[1], Miguel Quintas-Neves[2], Miguel Sá Breda[1]

[1]Braga Local Health Unit, Department of Otorhinolaryngology and Head and Neck Surgery, Braga, Portugal
[2]Braga Local Health Unit, Department of Neuroradiology, Braga, Portugal

Abstract

Internal carotid artery rupture in the middle ear is very rare and can be life-threatening. We report the case of a 78-year-old male with a history of chronic otitis media who presented with spontaneous, high-volume otorrhagia. Computed tomography imaging revealed a dissection of the petrous segment of the internal carotid artery with an associated pseudoaneurysm. As the rupture of the pseudoaneurysm was considered the cause of otorrhagia, endovascular stenting was performed. After hospital admission for monitoring and antibiotic treatment, the patient underwent subtotal petrosectomy, with no further episodes of hemorrhage.

Keywords: Chronic otitis media, internal carotid artery, otorrhagia, pseudoaneurysm, case report

ORCID IDs of the authors:
A.M.F. 0000-0002-6001-1049
G.M.R. 0000-0001-9450-8988
F.A.F. 0000-0002-2793-1476
D.R. 0000-0002-8464-9653
M.Q-N. 0000-0002-8183-5717
M.S.B. 0000-0002-4462-7046

Cite this article as: *Fernandes AM, Rios GMi, Ferreira FA, Ribeiro D, Quintas-Neves M, Sá Breda M. Otorrhagia in chronic otitis media: an unexpected presentation of internal carotid artery rupture. Turk Arch Otorhinolaryngol. [Epub Ahead of Print]*

Corresponding Author:
Alina Martín Fernandes, MD;
alina.martin.fernandes@gmail.com

Received Date: 16.12.2025
Accepted Date: 02.03.2026
Epub: 08.06.2026

Introduction

Internal carotid artery dissection occurs when blood enters the tunica media through a tear in the tunica intima, creating an intramural hematoma that may compromise the integrity of the arterial wall (1). Although uncommon, this process can, in certain situations, progress to arterial rupture, particularly in intracranial segments where the vessel wall is thinner and has less elastic support, leading to the formation of a pseudoaneurysm that cannot withstand high arterial pressures (2).

Otorrhagia in chronic otitis media is considered a relatively common finding due to the persistent mucosal inflammation characteristic of this condition. However, rupture of the internal carotid artery within the middle ear represents an exceptionally rare and severe complication, with only a few cases documented in the literature (3).

High-resolution computed tomography (CT) angiography is the first-line diagnostic modality in this context, which may be complemented by magnetic resonance angiography. Digital subtraction angiography remains the gold standard and offers the advantage of simultaneous therapeutic intervention (4). Management is usually medical, although endovascular or surgical approaches may be required in selected cases (4-6).

We describe the case of a patient with chronic otitis media who presented with otorrhagia, later found to be caused by a rupture of the petrous segment of the internal carotid artery

following a pseudoaneurysm that developed after carotid dissection. Although rare cases of otorrhagia due to internal carotid artery bleeding from carotid canal erosion by chronic otitis media have been described, our report highlights the acute and life-threatening nature of this presentation.

Case Presentation

We report the case of a 78-year-old male with a history of non-cholesteatomatous chronic otitis media of the right ear with approximately a decade of evolution, characterized by intermittent otorrhea, for which surgical treatment had been previously recommended at another institution but declined by the patient. No prior radiological imaging of the temporal bone was available. His additional medical history included medically controlled arterial hypertension, dyslipidemia, and type 2 diabetes mellitus. The patient presented to the emergency department with spontaneous (i.e., without trauma) high-volume otorrhagia from the right ear, unresponsive to compressive measures.

CT angiography revealed an interruption of the bony cortex in the right carotid canal, involving the medial wall of the tympanic cavity. Additionally, irregular filling of the internal carotid artery was observed, extending from just above the common carotid bifurcation to the petrous carotid canal over a length of 58-mm, suggestive of dissection of the internal carotid artery with an associated pseudoaneurysm measuring 1.3-mm at the level of the petrous segment (Figures 1-3).

For this reason, diagnostic angiography was further performed, followed by endovascular stenting with a PK Papyrus covered stent (4×15 mm; Biotronik AG, Berlin, Germany), a balloon-expandable, cobalt-chromium, single-layer covered stent with a polyurethane membrane (Figure 4).

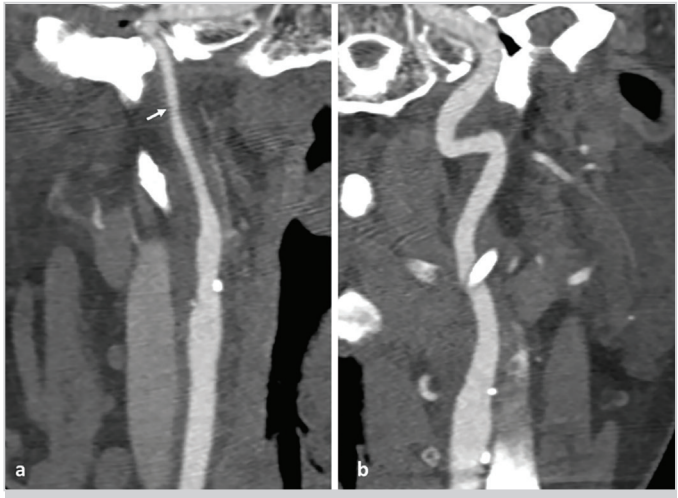

Figure 1. Computed tomography angiography reconstruction of the right (a) and left (b) internal carotid arteries, showing a diffuse thinned lumen in the former, suggestive of a carotid dissection (arrow), when compared with the contralateral carotid artery

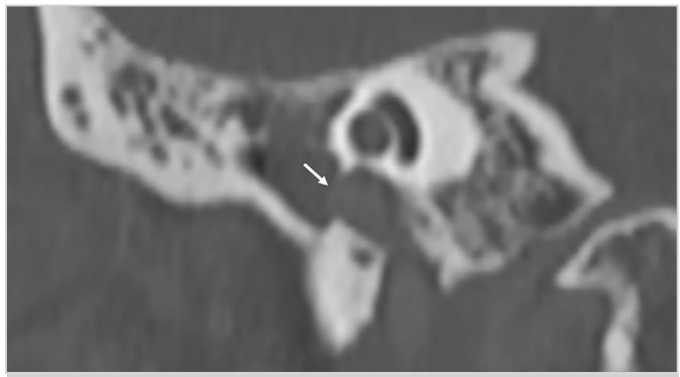

Figure 2. Coronal CT section of the right temporal bone showing dehiscence of the petrous carotid canal (arrow)
CT: Computed tomography

Figure 3. Digital subtraction angiography (DSA)-maximum intensity projection (MIP), 8.5 mm, showing a tiny pseudoaneurysm (arrow) as the probable cause of the carotid rupture

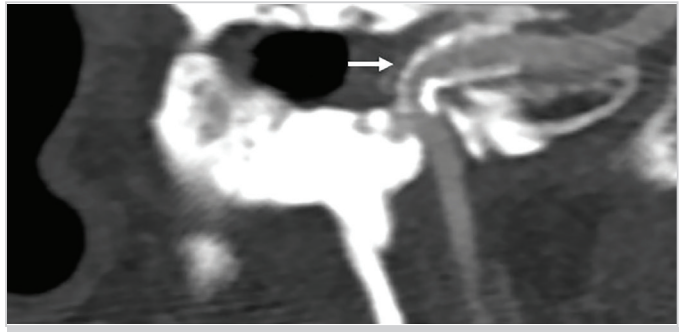

Figure 4. Computed tomography angiography reconstruction showing the carotid stent (arrow)

Following hospital admission for monitoring and antibiotic treatment, no further hemorrhagic episodes occurred. Audiometric evaluation during hospitalization revealed a profound mixed hearing loss in the right ear. Ear examination revealed a pars tensa perforation of the tympanic membrane, accompanied by inflamed middle ear mucosa, while the external auditory canal was normal, without inflammatory tissue or bony exposure.

The patient subsequently underwent a subtotal petrosectomy, which confirmed the bony dehiscence of the carotid canal, with exposure of the petrous segment of the internal carotid artery (Figure 5). The dehiscent area was reinforced using bone pâté and fibrin glue, the Eustachian tube was obliterated, the external auditory canal was closed, and the petrosectomy cavity was obliterated with abdominal fat.

After receiving loading doses of 300 mg of both clopidogrel and aspirin, the patient was maintained on dual antiplatelet therapy (clopidogrel 75 mg daily and aspirin 150 mg daily) for three months, followed by aspirin 150 mg daily as single therapy. His postoperative course was uneventful, and he remained asymptomatic for six months; however, he subsequently suffered a stroke secondary to occlusion of the right internal carotid artery, ultimately resulting in his demise.

Written informed consent was obtained from a family member acting as the patient's legal representative for the publication of this case report in accordance with institutional and ethical standards.

Discussion

Internal carotid artery dissection with an associated pseudoaneurysm in the petrous segment is an extremely rare but potentially life-threatening condition (3). In this case, the initial presentation with spontaneous otorrhagia was unusual and posed a diagnostic challenge. Imaging studies, particularly CT angiography and digital subtraction angiography, were essential for the accurate diagnosis and timely intervention with endovascular stenting, effectively controlling the bleeding and stabilizing the vessel.

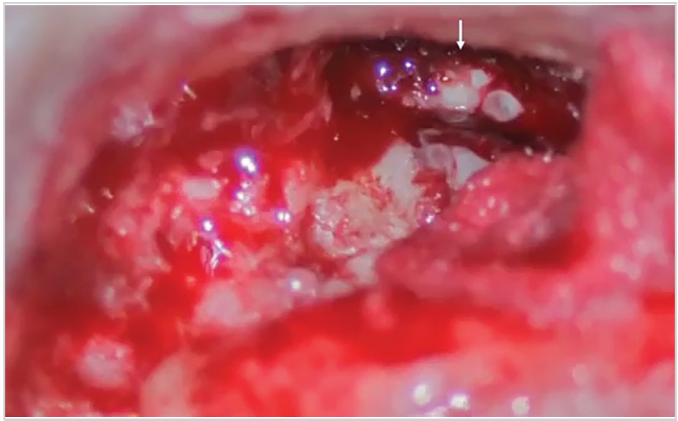

Figure 5. Right petrosectomy cavity showing a dehiscent carotid canal with exposure of the internal carotid artery (arrow)

Surgical management through subtotal petrosectomy was crucial in providing long-term protection of the exposed carotid artery (7,8). Given the bony dehiscence and proximity of the internal carotid artery to the middle ear, the risk of external aggressions, including trauma and recurrent infections, remains significant. The petrosectomy allowed complete exclusion of the middle ear cavity, thus isolating the artery from these potential hazards. This approach represents the only reliable method to safeguard the carotid artery in such anatomical circumstances, as conservative management alone would not eliminate the risk of recurrent hemorrhage or vessel injury.

Although surgical intervention is invasive and reserved for selected cases, in this context it was justified by the need to prevent further complications, ensuring vascular protection and patient safety, as well as to definitively controlling chronic otitis media in an ear without functional hearing.

The patient's risk factors, together with antiplatelet therapy alone, may have been insufficient to prevent the fatal thrombotic event. Furthermore, although the patient remained asymptomatic, scheduled follow-up imaging at 3-6 months could have provided valuable information on stent patency and early detection of any in-stent stenosis, thereby guiding further management.

Conclusion

Otorrhagia in the setting of a pseudoaneurysm rupture of the internal carotid artery is extremely rare and unusual, making it a bizarre clinical manifestation that can easily be overlooked. Early diagnosis and combined endovascular and surgical management are paramount for optimal patient outcomes. Subtotal petrosectomy can be regarded as an essential surgical procedure to protect the internal carotid artery in the setting of petrous segment dissection with subsequent pseudoaneurysm formation and bony dehiscence exposing the vessel to the middle ear. At the same time, it allows definitive treatment of the underlying chronic otitis media. By excluding the middle ear, this surgery effectively shields the carotid artery from external insults, such as trauma and infections, while also eliminating the chronic infectious focus, thereby reducing the risk of potentially fatal hemorrhagic events.

Ethics

Informed Consent: Written informed consent was obtained from a family member acting as the patient's legal representative for the publication of this case report in accordance with institutional and ethical standards.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.M.F., D.R., M.S.B., Concept: A.M.F., Design: A.M.F., Data Collection and/or Processing: A.M.F., G.M.R., F.A.F., M.Q-N., Analysis or Interpretation: A.M.F., M.Q-N., Literature Search: A.M.F., M.S.B., Writing: A.M.F., G.M.R.

Conflict of Interest: The authors declare that they have no conflict of interest.

Financial Disclosure: The authors declare that this study has received no financial support.

Main Points

- Spontaneous otorrhagia can be the first sign of a petrous internal carotid artery dissection with pseudoaneurysm, even in patients with simple chronic otitis media.
- Computed tomography angiography and digital subtraction angiography are essential for accurate diagnosis and timely endovascular intervention.
- Balloon-mounted covered stenting provides immediate vessel stabilization while preserving the parent artery in fragile or dissected segments.
- Subtotal petrosectomy offers long-term protection of the exposed carotid artery, excluding the middle ear from trauma or infection and definitively treating chronic otitis media.

References

1. Schievink WI. Spontaneous dissection of the carotid and vertebral arteries. N Engl J Med. 2001; 344: 898-906. [Crossref]
2. Krings T, Choi IS. The many faces of intracranial arterial dissections. Interv Neuroradiol. 2010; 16: 151-60. [Crossref]
3. Petri M, Dinescu V, Necula V, Cosgarea M. Otorrhagia as the initial presentation of an internal carotid artery aneurysm in the middle ear: case presentation. Clujul Med. 2016; 89: 297-300. [Crossref]
4. Nazzal M, Herial NA, Macnealy MW. Diagnostic imaging in carotid artery dissection: a case report and review of current modalities. Ann Vasc Surg. 2014; 28: 739.e5-9. [Crossref]
5. Urasyanandana K, Songsang D, Aurboonyawat T, Chankaew E, Withayasuk P, Churojana A. Treatment outcomes in cerebral artery dissection and literature review. Interv Neuroradiol. 2018; 24: 254-62. [Crossref]
6. Atiiga P, Lakshminarayan R, Nejadhamzeeigilani H. Utilisation of a balloon-mounted coronary stent in the treatment of a patient with petrous carotid artery dissection. BMJ Case Rep. 2024; 17: e258854. [Crossref]
7. Spiessberger A, Baumann F, Kothbauer KF, Aref M, Marbacher S, Fandino J, et al. Bony dehiscence of the horizontal petrous internal carotid artery canal: an anatomic study with surgical implications. World Neurosurg. 2018; 114: e1174-9. [Crossref]
8. Li KL, Agarwal V, Moskowitz HS, Abuzeid WM. Surgical approaches to the petrous apex. World J Otorhinolaryngol Head Neck Surg. 2020; 6: 106-14. [Crossref]