Case 12569

Eurorad

Pseudoaneurysm of the internal carotid artery: a late complication of otomastoiditis

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Section: Neuroradiology
Area of Interest: Ear / Nose / Throat Head and neck
Vascular
Procedure: eLearning
Procedure: Embolisation
Imaging Technique: CT-Angiography
Imaging Technique: MR
Imaging Technique: MR-Angiography
Imaging Technique: Catheter arteriography
Imaging Technique: CT
Special Focus: Aneurysms Abscess Case Type: Clinical
Cases
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Vélez, S
Patient: 70 years, female

Clinical History:

Our patient is a 70-year-old female hospitalized in Intensive Care Unit (ICU) with a sepsis following otomastoiditis. After right open mastoidectomy surgery, there is a complication with a deep parapharyngeal space abscess and inflammatory changes surrounding the right Internal Carotid Artery (ICA). The findings persist in following controls.
Imaging Findings:

CT of the temporal bone shows occupation of the right middle ear and mastoid cells, erosive lysis and ill-defined irregular edges of the petrous apex, suggesting right petrous apicitis (Fig 1).
Inflammatory changes in deep parapharyngeal space and surrounding right ICA persist over time in successive controls with spasm and decrease in diameter of the artery (Fig 2).
MRI control after four months (Fig 3) shows a parapharyngeal abscess and a vascular dilatation image adjacent to the right ICA proximal to the entrance in the skull base as a late complication of otomastoiditis. It is confirmed with CT angiography (Fig 4). After conventional arteriography (Fig 5a) the lesion was successfully treated by coil embolization (Fig 5b).
Discussion:

Pseudoaneurysms of the extracranial Internal Carotid Artery (ICA) are a rare but potentially lethal complication. False aneurysms or pseudoaneurysms means that there is a leak through the wall of the artery and therefore the blood is contained by the adventitia or surrounding perivascular soft tissue. They lack a true wall and develop when a thrombus and fibrous tissue capsule forms in response to injury to all layers of the arterial wall. The injury may result from several mechanisms including trauma, infections, inflammation or radiation. Chronic otomastoiditis, pharyngeal infections and cholesteatomas have been implicated in the development of these aneurysms [1], [2]. In our case it was the consequence of a late complication after four months of a process of otomastoiditis with

inflammatory changes in deep parapharyngeal space.
ICA pseudoaneurysms of infectious aetiology probably originate secondary to adventitial infection of the artery because of closeness to the middle ear rather than hematogenous seeding. The natural evolution is progressive enlargement of the lesion with high risk of rupture.
Infected aneurysm is a serious clinical condition that is associated with significant morbidity and mortality. The risk of rupture is higher than the rupture risk of a true aneurysm [3]. The lack of structural integrity of the wall of a pseudoaneurysm may result in rapid expansion because of the turbulent flow and poor support of the wall.
Treatment consists of antibiotic therapy combined with surgical therapy [4]. Direct surgical repair with preservation of the ICA may be technically difficult and is associated with relatively high morbidity and mortality. Endovascular coil embolization or stent placement with preservation of the artery is the alternative treatment.
In our case, coil embolization of the pseudoaneurysm was successfully performed with complete obliteration of the cavity and without suffering permanent neurological sequelae. The endovascular method provides an effective, relatively low-risk treatment for these lesions.
Differential Diagnosis List: Pseudoaneurysm of the internal carotid artery as a late complication of otomastoiditis., ICA dissection, True aneurysm

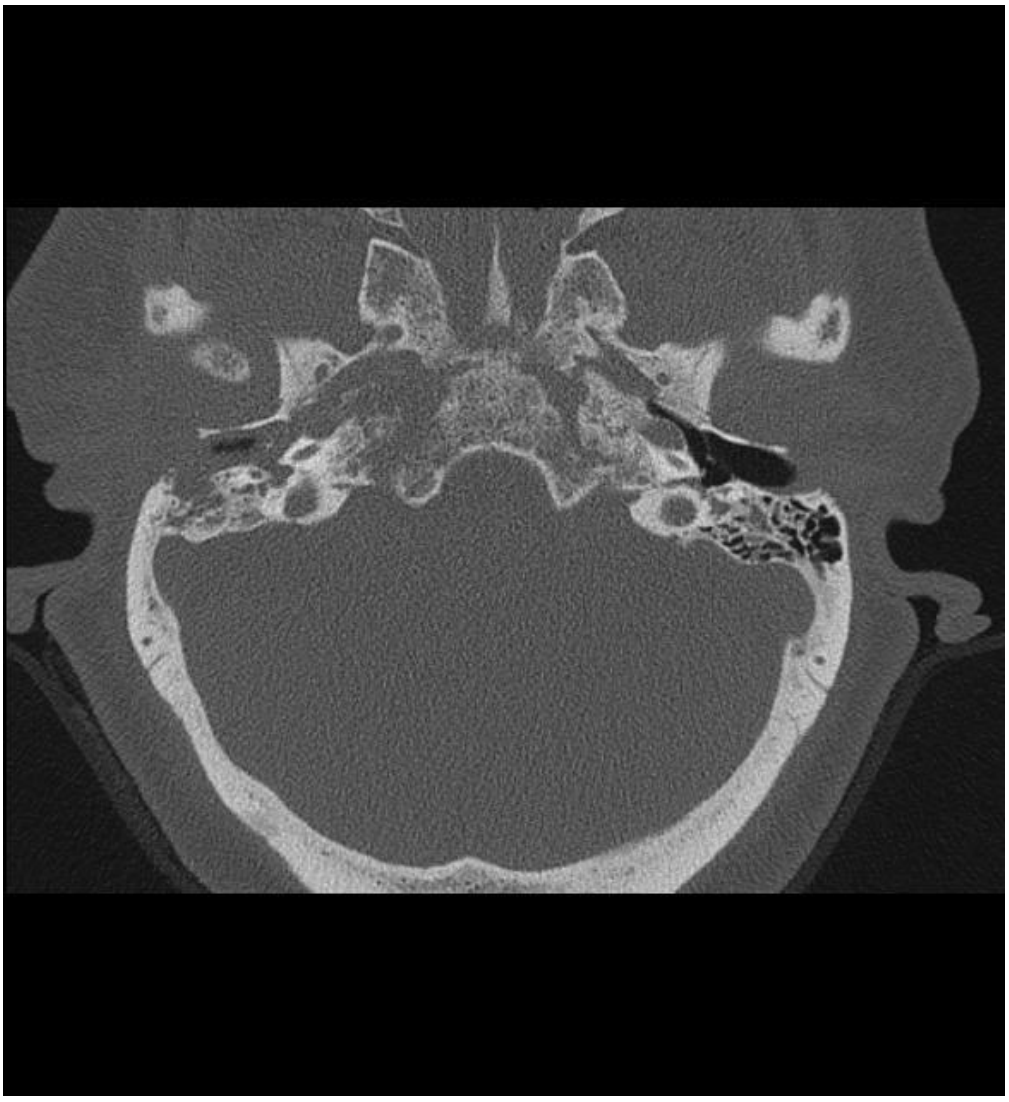
Final Diagnosis: Pseudoaneurysm of the internal carotid artery as a late complication of otomastoiditis.

References:

Iguchi H, Takayama M, Kusuki M, Nakamura A, Kanazawa A, Hachiya K, Yamane H. (2006) Carotid artery pseudoaneurysm as a rare sequela of surgery for laryngeal cancer. Acta Otolaryngol May;126(5):557-60 (PMID: 16698710)
Naik DK, Atkinson NR, Field PL, Milne PY. (1995) Mycotic cervical carotid aneurysm. Aust N Z J Surg Aug;65(8):620-1 (PMID: 7661813)
Baril DT, Ellozy SH, Carroccio A, Patel AB, Lookstein RA, Marin ML. (2004) Endovascular repair of an infected carotid artery pseudoaneurysm. J Vasc Surg Nov;40(5):1024-7 (PMID: 15557920)
Kadyrov NA, Friedman JA, Nichols DA, Cohen-Gadol AA, Link MJ, Piepgras DG. (2002) Endovascular treatment of an internal carotid artery pseudoaneurysm following transsphenoidal surgery. Case report. J Neurosurg Mar;96(3):624-7 (PMID: 11883853)

Figure 1

a



Description: Bone window. Occupation of the right middle ear and mastoid cells, erosive lysis and ill-defined irregular edges of the petrous apex suggesting right petrous apicitis. **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

b

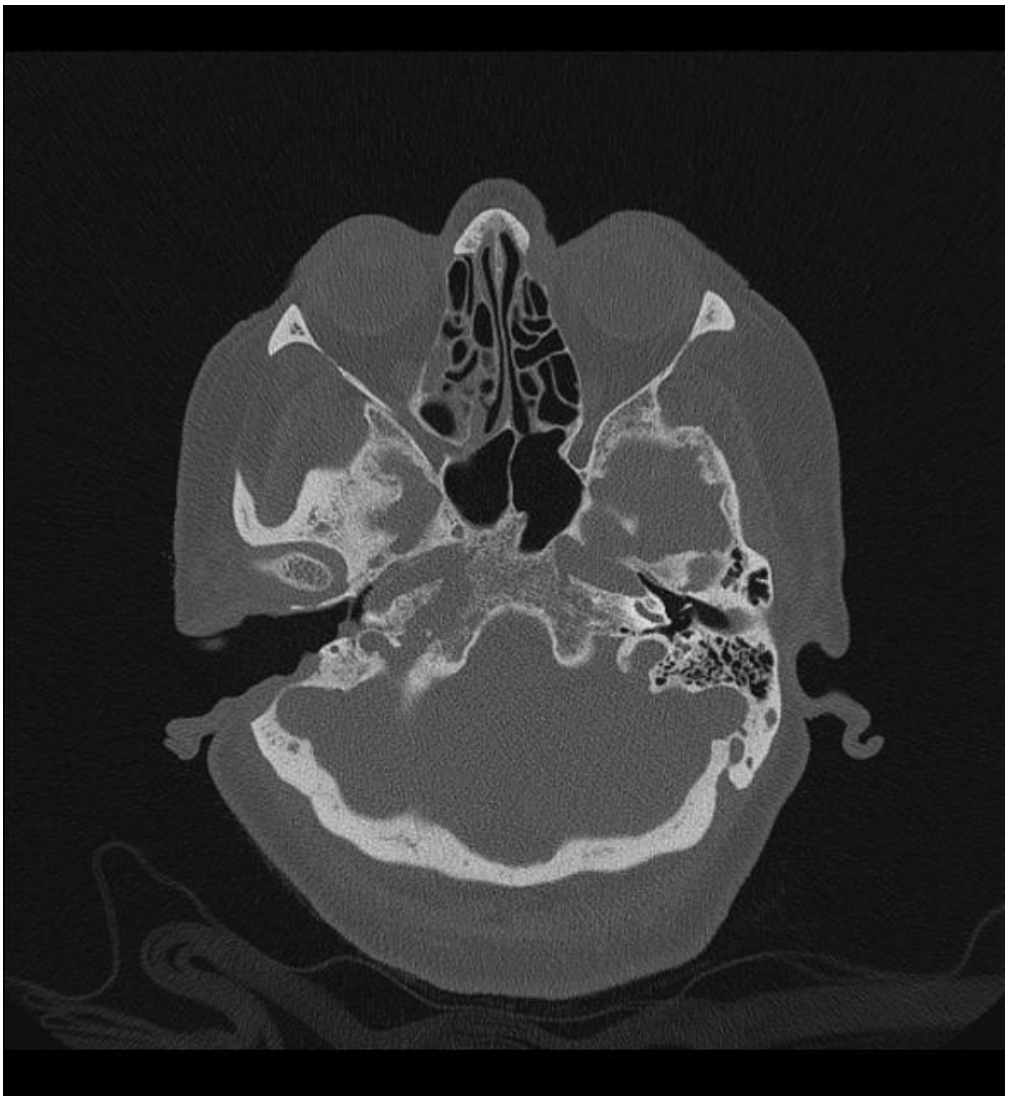
Description: Inflammatory changes in right deep parapharyngeal space **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

c

Description: Inflammatory changes surrounding right ICA with spasm and decrease in diameter of the artery **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

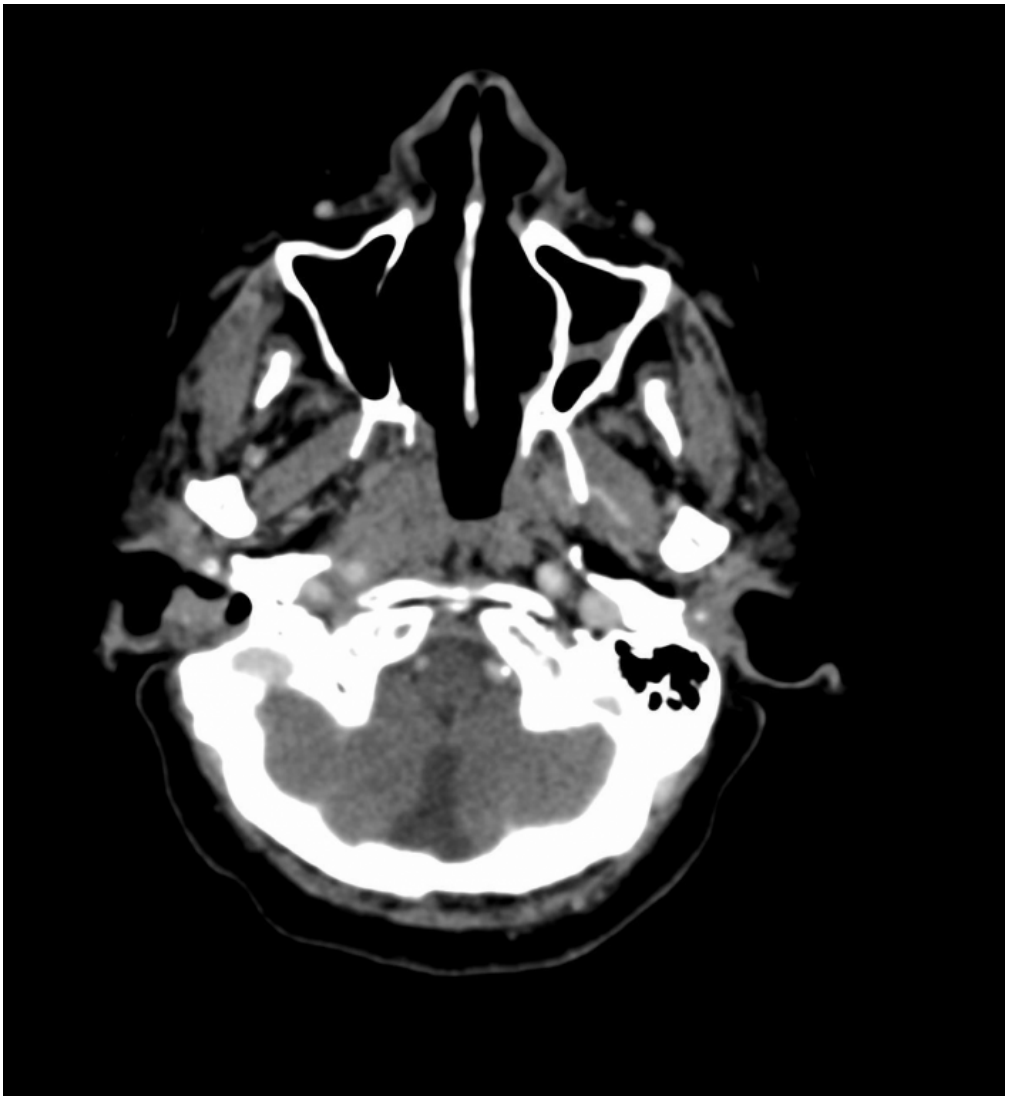
Figure 2

a



Description: Postoperative changes after right open mastoidectomy surgery **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

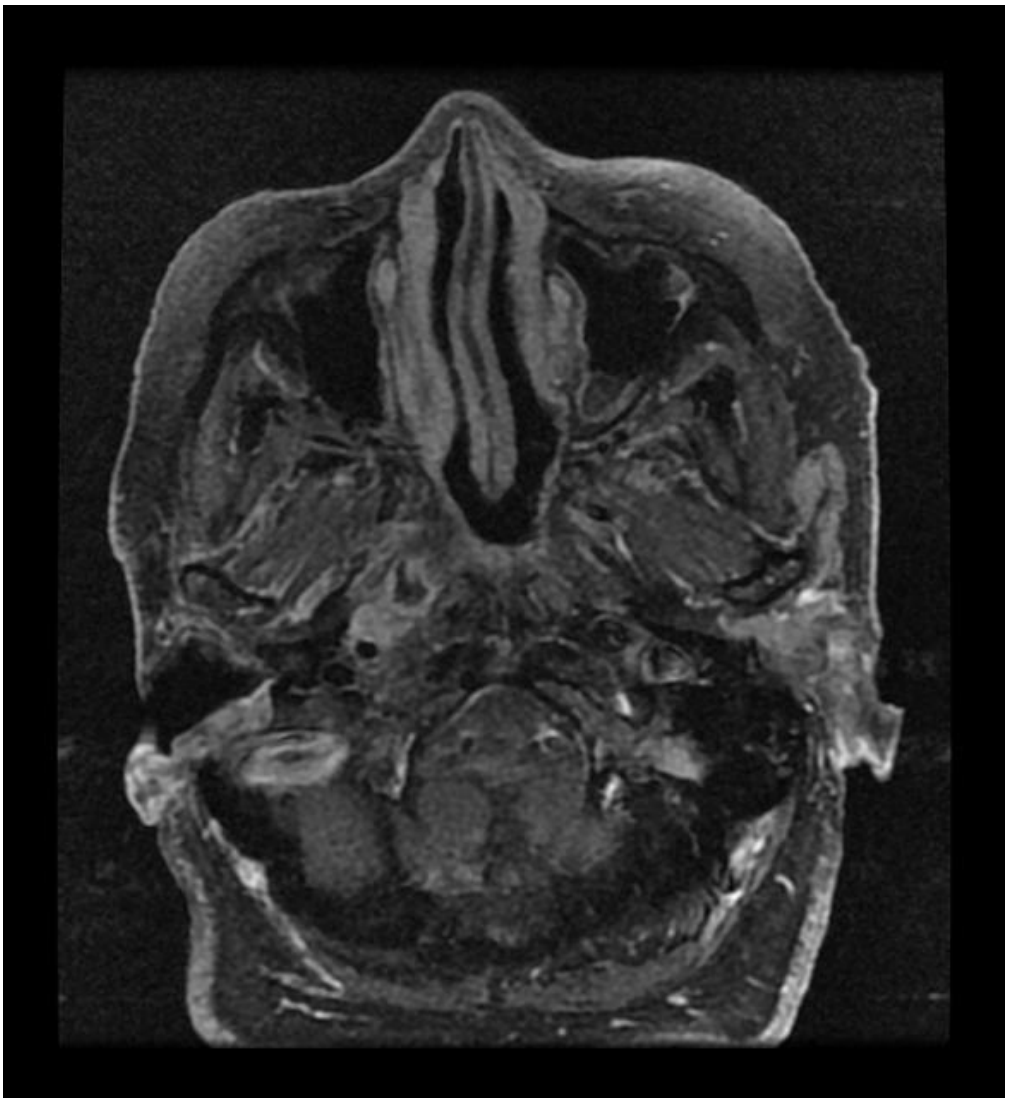
b



Description: Persistance of the inflammatory changes surrounding the right ICA and deep parapharyngeal space **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

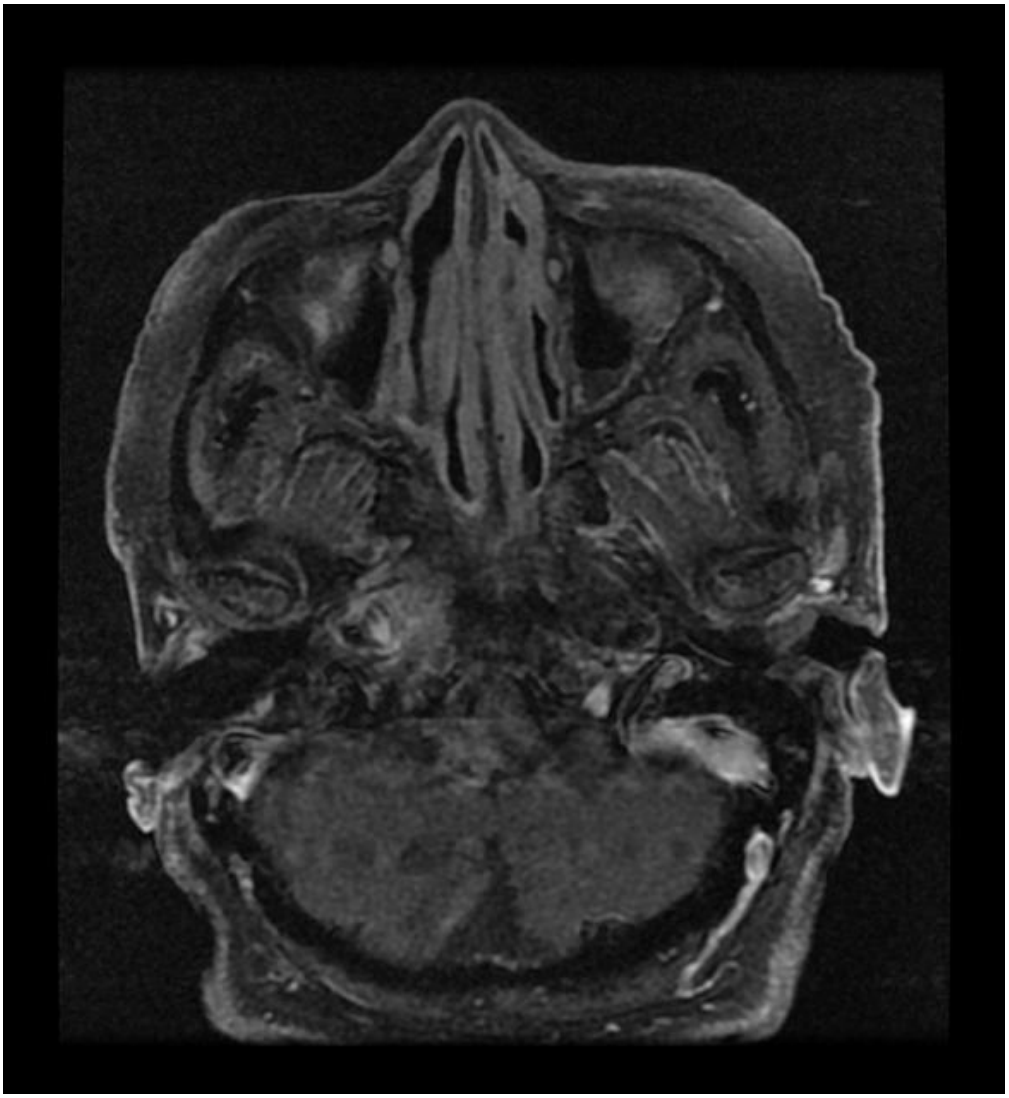
Figure 3

a



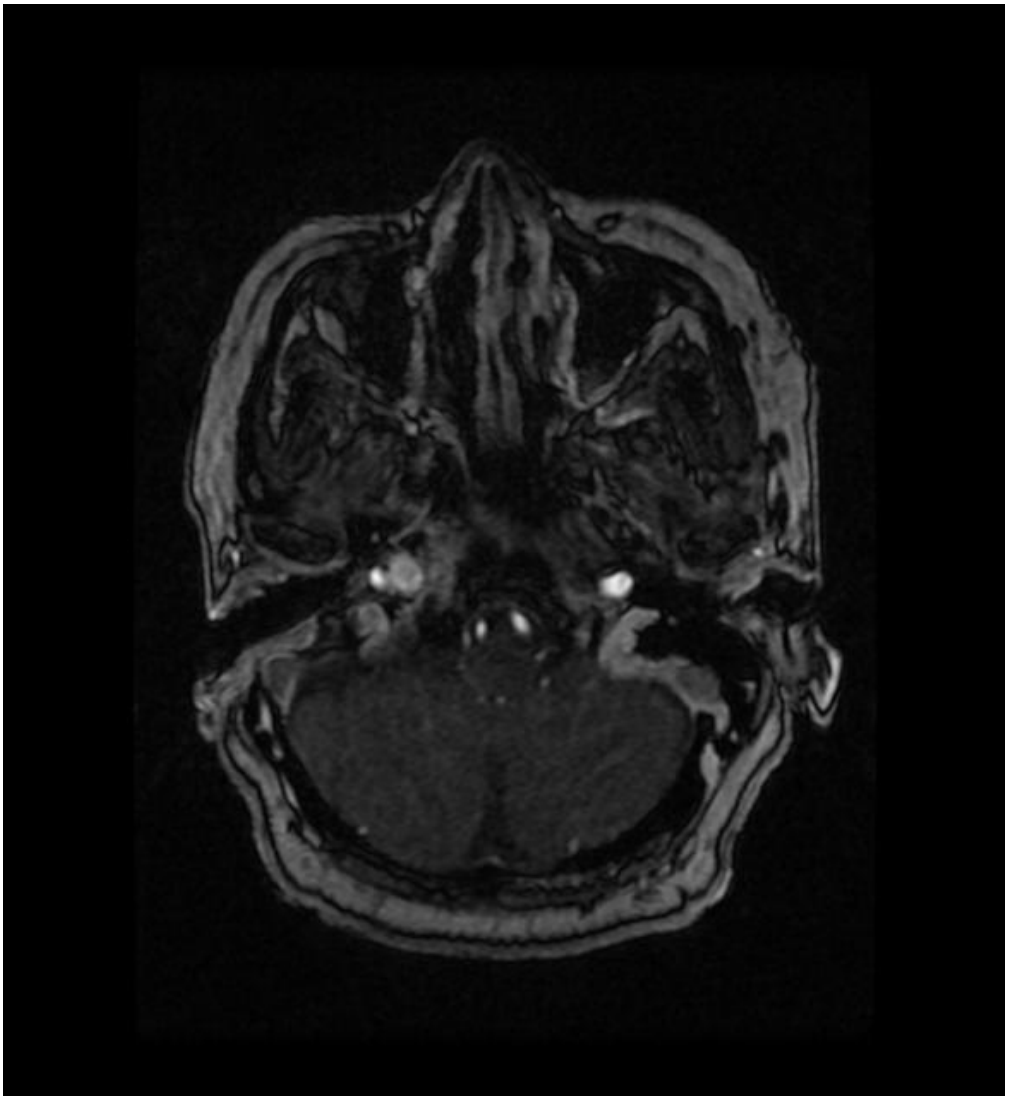
Description: Contrast enhanced MRI control showing an abscess in the right deep parapharyngeal space and inflammatory changes surroundind the ICA **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

b



Description: Contrast enhanced MRI control. Flow void image adjacent to the right ICA **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

c



Description: 3D TOF angiography showing a vascular dilatation of the right ICA **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

Figure 4

a

Description: Sagital CT angiography. Vascular dilatation image adjacent to the right ICA proximal to the entrance in the skull base **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

b

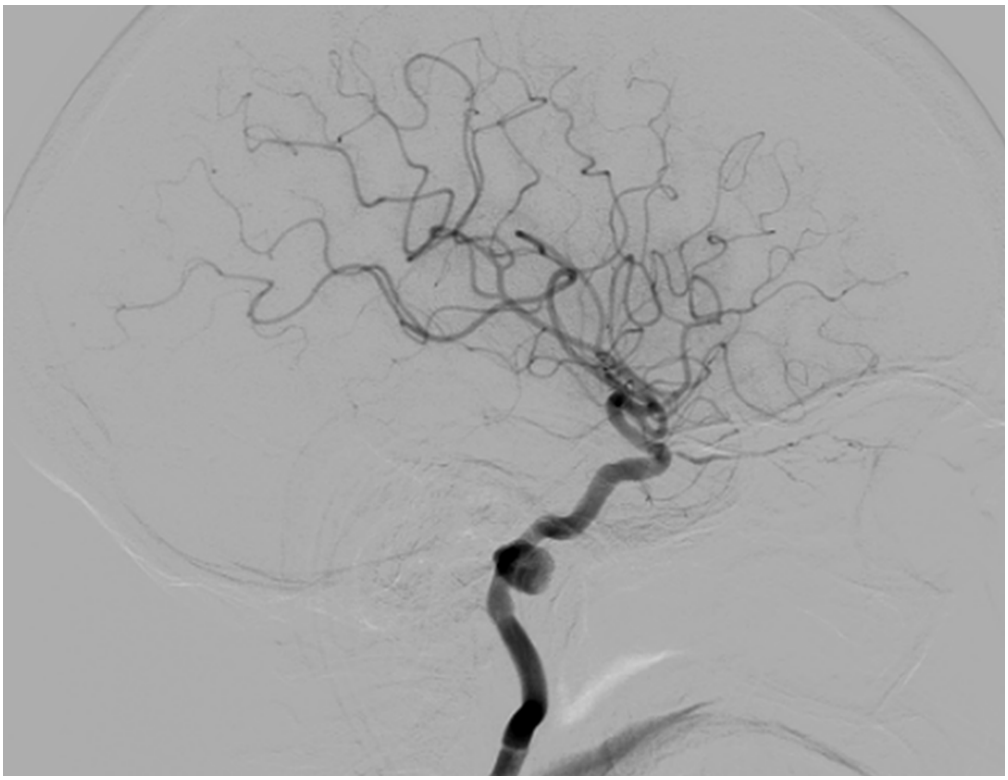
Description: Axial CT angiography. Vascular dilatation image adjacent to the right ICA proximal to the entrance in the skull base **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

c

Description: Volume Rendering. Vascular dilatation image adjacent to the left ICA proximal to the entrance in the skull base **Origin:** Department of Radiology, Hospital Infanta Cristina (Parla), Spain.

Figure 5

a



Description: Conventional arteriography of the right ICA showing the pseudoaneurysm **Origin:** Getafe, Madrid. Spain.

b

Description: Substraction angiography after coil embolization of the aneurysm cavity **Origin:** Getafe, Madrid. Spain.