

# A neck mass revealing an extracranial internal carotid artery aneurysm

## Tuméfaction cervicale révélatrice d'un anévrisme de la carotide interne extra-crânienne.

H. Chahed<sup>1</sup>; M Cherif<sup>1</sup>; A Mediouni<sup>1</sup> ; R Jebnoun<sup>1</sup>; R Zainine<sup>1</sup> ; R. Bechraoui<sup>1</sup>; J Marrakchi <sup>1</sup>; N Beltaief<sup>1</sup>; F. Ghdira<sup>2</sup>; G Besbes<sup>1</sup>; R Denguir<sup>2</sup>.

<sup>1</sup>Department of ENT surgery, Rabta Hospital, Tunis, Tunisia

<sup>2</sup>Department of cardiovascular surgery; Rabta Hospital, Tunis, Tunisia

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### RÉSUMÉ

**Objectif:** Rapporter un diagnostic étiologique rare et déroutant devant une tumefaction cervicale d'installation aiguë.

**Observation:** **Patient** âgé de 45 ans, a consulté aux urgences pour une tumefaction cervicale évoluant depuis une semaine non améliorée par le traitement antibiotique l'angioscanner cervicale a conclu à un anévrisme thrombosé de la carotide interne droite extracranienne. Une resection de l'anévrisme avec une reconstruction artérielle par une interposition veineuse ont été réalisées avec des suites simples.

**Conclusion:** Les anévrismes de la carotide interne extra-cranienne, quoique rares, doivent être évoqués devant toute tuméfaction cervicale aiguë.

L'angioscanner cervical permet de confirmer le diagnostic et de guider la prise en charge thérapeutique .

**Mots-clés:** Anévrisme, Carotide interne, Masse cervicale, Angioscanner, chirurgie.

### ABSTRACT

**Objective:** To report a rare misleading diagnosis of an acute cervical swelling.

**Observation:** We present the case of a 45 year old man who presented to our emergency department with a neck swelling which had been evolving since a week, with no improvement on antibiotics. A CT-scan with contrast revealed a thrombosed internal carotid artery aneurysm. The patient underwent a resection of the aneurysm and an end to end reconstruction with a venous graft.

**Conclusion:** Extracranial internal carotid aneurysms are rare but ENT surgeon must keep in mind such a diagnosis face to an acute laterocervical swelling. Cervical angio-CT scan confirms the diagnosis and guides the therapeutic management.

**Key words:** Aneurysm, Internal carotid, Neck mass, Angio CT scan, surgery

### INTRODUCTION:

Arterial aneurysms are defined as a dilatation of the blood vessels due to wall weakening caused by multiple factors. For the internal carotid artery the caliber must be over 50% compared to the reference values [1]. External internal carotid artery aneurysm (ICAA) is uncommon but can be responsible of serious complications such as rupture, thrombosis, or embolism[1,2]. Early diagnosis and therapeutic management are mandatory to prevent such fatal evolution. We report the case of an extracranial internal carotid artery aneurysm (ICAA) revealed by a latero-cervical swelling and misdiagnosed initially as an adenophlegmon.

### OBSERVATION:

A 45 year old man presented to ENT emergency department with a laterocervical swelling with neck

pain, fever, intense headache and dysphagia not improved after one week of antibiotics (Amoxicillin-clavulanic acid and Metronidazole) (figure1).



**Figure 1 :** A neck mass revealing an internal carotid artery aneurysm

Corresponding Author: Houda Chahed  
address: Department of ENT surgery, Rabta Hospital, Tunis, Tunisia  
Email: houda.chahed@gmail.com

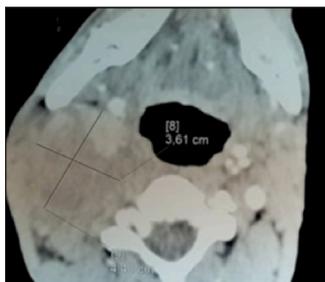


Figure 2



figure 3

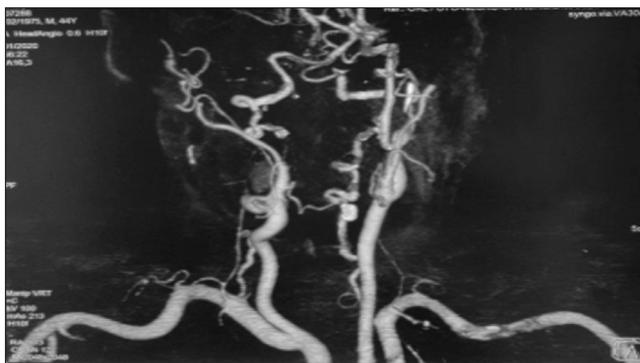


Figure 4

**Figure 2.3.4:** Cervical CT scan with contrast enhancement axial (figure 2) and sagittal reconstruction (figure 3) and angio CT scan (figure 4): A partially thrombosed saccular aneurysm of the right internal carotid artery with a longitudinal diameter of 47mm and transversal diameter of 43\*32mm. Downstream vascularity was absent and the intracranial perfusion was maintained by collateral arteries

He was a non-smoker, non alcoholic and he didn't have any pathological past history. No traumatic event was reported.

Clinical examination showed a retro-mandibular mass of 4cm size at the right side of the neck. It was non pulsatile, firm, very sensitive and fixed. There were no evident inflammatory signs. The oropharyngeal examination was normal with no trismus, no vestibular or parapharyngeal bulge. The palatine tonsils and the cranial nerve examination was normal. The neurologic examination was normal.

The diagnosis was established after a cervical angio-CT scan which showed a saccular aneurysm of the right internal carotid artery with a longitudinal diameter of 47mm and transversal diameter of 43\*32mm (figure 2, 3). Downstream vascularity was almost absent and the intracranial perfusion was maintained by collateral arteries (figure 4).

The patient was referred to the cardiovascular department where he underwent a surgical treatment. He had an aneurysm resection of the ICAA with a with the long saphenous vein graft interposition A lateral anastomosis between the vein and the proximal carotid artery. An end to end anastomosis between the vein and the remaining normal internal carotid artery was performed. The post operative course were uneventful.

## DISCUSSION :

ICAA remains an uncommon pathology. Very few multicentric studies surrounding them exist and the most recent articles are about isolated case reports.

According to the data of the largest series, the incidence of extracranial carotid artery aneurysms ranges between 0,24 et 0,94%, concerning particularly male gender at their sixth's decade [1, 2,3].

The ICAA can be classified in true or false aneurysms depending on their etiology. False or pseudo aneurysms are most commonly due to traumatic event or iatrogenic (previous vascular surgery) [4]. The most common risk factors of true ICAA are atherosclerosis over 75% usually located at the bifurcation of the common carotid artery [3,5] and fibromuscular dysplasia [6]. Other rare factors are cervical radiations, systemic diseases such as marfan's syndrome, behcet's syndrome, or takayashu arteritis. As in our case report, External ICAA may be idiopathic without any risk factor or etiology.

ICAA spontaneously evolves by increasing in size which can induce a mass syndrome (dysphagia, dyspnea, dysphonia, neck pain), thrombosis or embolism. Very few ENT manifestations were reported : oropharyngeal masses or infections like recurrent tonsillitis or pharyngitis [7,8,9], neck masses or intralaryngeal protrusion [10]. Patients may present with major neurological event in 40% [5,11]. The risks for ischemic attacks are more than 50% in asymptomatic patients [12]. Other potential neurologic manifestations include tinnitus, dizziness, facial nerve palsy [1]

According to Radak and al, clinical manifestations were transient ischemic attacks in 36.3%, a stroke in 12.1%, and compression of cranial nerves in 15.4% [3]. Neck swellings were reported in 31.9% of the symptomatology in the ER in Li Z et al study [11].

Clinical examination looks for a pulsatile neck mass, neurological signs such as cranial pair involvement (in particular the IX, X and XII pairs) or Claude Bernard Horner sign (sympathetic cervical nerve) [1]. Our patient main complains were acute painful laterocervical swelling with intense headache and dysphagia without any neurologic deficiency.

The diagnosis may be established by Doppler ultrasound. But the CT angiography, is the most reliable radiologic investigation to establish the diagnosis. It has a better anatomical accuracy than the ultrasound or angiography, and can precise the state of the vascularization upstream and downstream as well as the presence of a mural thrombus. Moreover it may provide extravascular anatomical details which may be utilized to plan the surgical approach. [12]

Extracranial internal carotid aneurysms, seldom rupture but are associated with high risk of neurological thromboembolic episodes and cranial nerve dysfunction. Thus conservative treatment with anticoagulant or antiagregant therapy is almost abandoned, only few indications remain like young patients with asymptomatic, traumatic or spontaneous dissecting aneurysms [14]. Surgery is the first line



treatment to prevent permanent neurological deficit. Total resection of the aneurysm with direct end to end anastomosis is the more adequate procedure but due to the difficulties of this anastomosis an alternative procedure is available and more frequent with a vein graft interposition, like in our case, or a synthetic graft [3, 10, 13, 14]. Ligature of the internal carotid artery is very rare, it's only indicated in massive and uncontrolled hemorrhage due to the rupture of the aneurysm to save the patient [3].

Postoperative complications count transient stroke, transient ischemic attacks, transient facial paralysis (when infratemporal approach is chosen), glosso-pharyngeal paralysis, cranial nerve palsies [3, 10,14]. No complications were reported in our case report.

Endovascular procedures have also been described for treatment of ECAA. They are indicated for false traumatic aneurysms of the internal carotid artery localized high in the neck, at the base of the skull [5]. This approach has less risk of cranial nerve deficit than open air surgery. Li et al study in 2011 on 224 patients treated with endovascular stents (covered stents and bare metal stents) showed a 92.8% success with a rate of cranial nerve complication less than 5% [11].

## CONCLUSION:

Extracranial aneurysms of the internal carotid artery are uncommon. ENT manifestations are the second more frequent after neurological signs. Such a diagnosis must be evoked face to an acute laterocervical swelling even when it is not pulsatile. Angio-CT scan establishes the diagnosis. The treatment is surgical but there is no consensus about the approach even if endovascular surgery tends to be more favored due to its reduced morbidity and better outcome.

## Compliance with ethical standards

**Conflict of interest:** The authors stated that there is no conflict of interest.

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## REFERENCES:

1. Philip A Sosa, Phillip Matar, Isabel T Gross. Extracranial Internal Carotid Aneurysm in a 10-Year-Old Boy Diagnosed via Ultrasound. *Pediatr Emerg Car.* 2019;35(3):e49-e52.
2. Fankhauser GT, Stone WM, Fowl RJ, O'Donnell ME, Bower TC, Meyer FB, et al. Surgical and medical management of extracranial carotid artery aneurysms. *J Vasc Surg.* 2015;61:389-93.
3. Radak Đ, Davidović L, Vukobratov V, Ilijevski N, Kostić D, Maksimović Ž, et al. Carotid Artery Aneurysms: Serbian Multicentric Study. *Ann Vasc Surg.* 2007;21(1):23-9.
4. Yuen JC, Gray DJ. Endovascular Treatment of a Pseudoaneurysm of a Recipient External Carotid Artery Following Radiation and Free Tissue Transfer: *Ann Plast Surg.* 2000;44(6):656-9.
5. Goldstone J. Aneurysms of the external carotid artery. In: Rutherford RB, ed. *Vascular Surgery*, 5th ed. Philadelphia: W.B. Saunders, 2000, pp 1843-1853.
6. Kadian-Dodov D, Gornik HL, Gu X, Froehlich J, Bacharach JM, Chi Y-W, et al. Dissection and Aneurysm in Patients With Fibromuscular Dysplasia. *J Am Coll Cardiol.* 2016;68(2):176-85.
7. Gralla J, Brekenfeld C, Schmidli J, Caversaccio M, Do D-D, Schroth G. Internal Carotid Artery Aneurysm With Life-Threatening Hemorrhages in a Pediatric Patient: Endovascular Treatment Options. *J Endovasc Ther.* 2004;11(6):734-8.
8. Jarvis S, Parker A. External carotid artery aneurysm in an infant presenting with oropharyngeal haemorrhage. *J Laryngol Otol.* 2001;115(6):500-1.
9. Bakhos D, Lescanne E, Cottier J-Ph, Beutter P, Morinière S. Anévrysme de l'artère carotide interne dans sa portion extracrânienne. *Ann Otolaryngol Chir Cervico-Faciale.* 2004;121(4):245-8.
10. Faggioli G, Freyrie A, Stella A, Pedrini L, Gargiulo M, Tarantini S, et al. Extracranial internal carotid artery aneurysms: Results of a surgical series with long-term follow-up. *J Vasc Surg.* 1996;23(4):587-95.
11. Li Z, Chang G, Yao C, Guo L, Liu Y, Wang M, et al. Endovascular Stenting of Extracranial Carotid Artery Aneurysm: A Systematic Review. *Eur J Vasc Endovasc Surg.* 2011;42(4):419-26.
12. M Smith 1, P Johnson . Spontaneous extracranial internal carotid artery aneurysm: a case report. *West Indian Med.* 2013;62(7):667-71.
13. Rosset E, Albertini J-N, Magnan PE, Ede B, Thomassin JM, Branchereau A. Surgical treatment of extracranial internal carotid artery aneurysms. *J Vasc Surg.* 2000;31(4):713-23.
14. El-Sabrou R, Cooley DA. Extracranial carotid artery aneurysms: Texas Heart Institute experience. *J Vasc Surg.* 2000;31(4):702-12.