Scholars Journal of Medical Case Reports

OPEN ACCESS

Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com/sjmcr/

Pulsatile Proptosis: Think About the Carotid-Cavernous Fistula

Ayman El Farouki[1*], Hassan Doulhousn[1], Habib Bellamlih[2], Soufiane Belabbes[3]

[1]Radiology Department, 5th Military Hospital -Guelmim
[2]Radiology Department, 4th Military Hospital -Dakhla
[3]Radiology Department, Moulay Ismail Military Hospital, Meknes, Morocco

DOI: 10.36347/sjmcr.2020.v08i10.002 | **Received:** 23.09.2020 | **Accepted:** 03.10.2020 | **Published:** 06.10.2020

***Corresponding author:** El Farouki A

Abstract **Case Report**

Carotid-cavernous fistula is an abnormal communication between the cavernous sinus and the carotid arterial system. The clinical presentation is dominated by pulsatile proptosis. We report the case of a 31-year-old man who presented with a recent onset of pulsatile proptosis. A cerebral angio-CT scan revealed a left-sided dilation of the cavernous sinus veins due to a direct carotid cavernous fistula. The patient was referred to radiology department where and endovascular approach was performed.

Keywords: Pulsating proptosis, Carotid-cavernous fistula, Carotid artery, Cavernous sinus, CT-angiography.

INTRODUCTION

Carotid-cavernous fistula (CCF) is an abnormal communication between the cavernous sinus and the carotid arterial system [1]. It is a rare pathology occurring most often after a traumatic event [2]. The clinical presentation is dominated by pulsatile proptosis [3]. However, it can remain unrecognized for a long time and diagnosed at a late stage involving the vital and visual prognosis [4]. We present the case of a young 31-year-old patient with post-traumatic carotid-cavernous fistula revealed two months after the cranio-facial traumatisme.

CLINICAL CASE

A 31-year-old man presented to the ophthalmology department with a recent onset of proptosis. He was the victim of a head trauma two months earlier. Initial imaging did not show any bone lesion. The consequences were marked by the onset of tinnitus, with left proptosis and chemosis without loss of visual acuity. Clinical examination found a ptosis with dilation of the episcleral veins and left pulsatile proptosis and thrill on palpation (***ERROR! REFERENCE SOURCE NOT FOUND.***). A cerebral Angio CT-scan was performed (FIG-2) which revealed an important dilation of the cavernous sinus veins (FIG-2 A). It also shows a dilation and opacification in the arterial phase of the superior ophthalmic (SOV) (FIG-2 B), prepontic, peribulbar (FIG-2 D) and cortical veins (FIG-2 C). The venous sinuses were opacified in the arterial phase (FIG-2 D). We also noted a oculomotor muscles thickening associated to a grade B proptosis (FIG-2 A).

DISCUSSION

Carotid-cavernous fistula (CCF) is an abnormal communication between the carotid arteries and the cavernous sinus [1]. It is a rare condition which can be spontaneous or post-traumatic [5]. Direct or high-flow (Type A) CCFs results from a direct shunt between the internal carotid artery and the cavernous sinus [1]. They are most often post-traumatic and concern 0.2% of patients with head trauma [3]. In 24% of cases, they can result from a rupture of an intracavernous internal carotid aneurysm [3]. Low-flow dural fistulas can be supplied by the intracavernous branches of the internal carotid artery (Type B), or the external carotid artery (Type C) or from both the internal and external carotid branches (Type D) [1] (FIG-3).

The clinical signs are dominated by the ophthalmologic manifestations, mainly the exophthalmos which is unilateral and pulsatile [4]. It may be associated with chemosis or oculomotor palsy [3].

In some patients proptosis and conjunctival chemosis may be lacking, in these cases their absence is explained by the multicompartmental character of the cavernous sinus, with the absence of connection with the ophthalmic vein. The blood is drained to petrous

sinuses, cortical veins, and less frequently to the prepontic or spinal veins which can cause a spinal cord compression [1].

Brain CT or MRI can visualize indirect signs of CCF [4]. They confirm proptosis, objectify the thickening of the intra-orbital muscles, with an enlargement of the cavernous compartment and a dilation of the superior ophthalmic vein. Angio-CT scan confirms the arteriovenous shunt with opacification in the arterial phase of the veins of the cavernous sinus, the ophthalmic veins and the petrous sinuses [6].

Color Doppler provides arguments for the diagnosis by showing an inverted Doppler signal with systolic strengthening in the SOVs [4].

Arteriography is the key in the management of CCF. It allows firstly to confirm the diagnosis and characterize the fistula, and secondly to treat the CCF [4]. In fact, treatment of CCF is urgent because of the risks associated with intracavernous venous hyperpressure, involving the functional and vital prognosis. It is based on the closure of the arteriovenous communication, by balloon or coils, more recently by reconstruction of the damaged carotid wall with a covered stent or even by carotid occlusion [7].

The efficacy is immediate on pulsatile exophthalmos; recovery of oculomotricity is later [4].

CONCLUSION

Pulsatile exophthalmos is the most suggestive clinical finding of a carotid-cavernous fistula and should lead to the realization of a cerebral angio-CT scan which may show signs of CCF. The arteriography should not be delayed; it will confirm the diagnosis of CCF and permit the treatment of the CCF.

Fig-1: Left ptosis, chemosis and proptosis in a 37 years-old patient with CCF

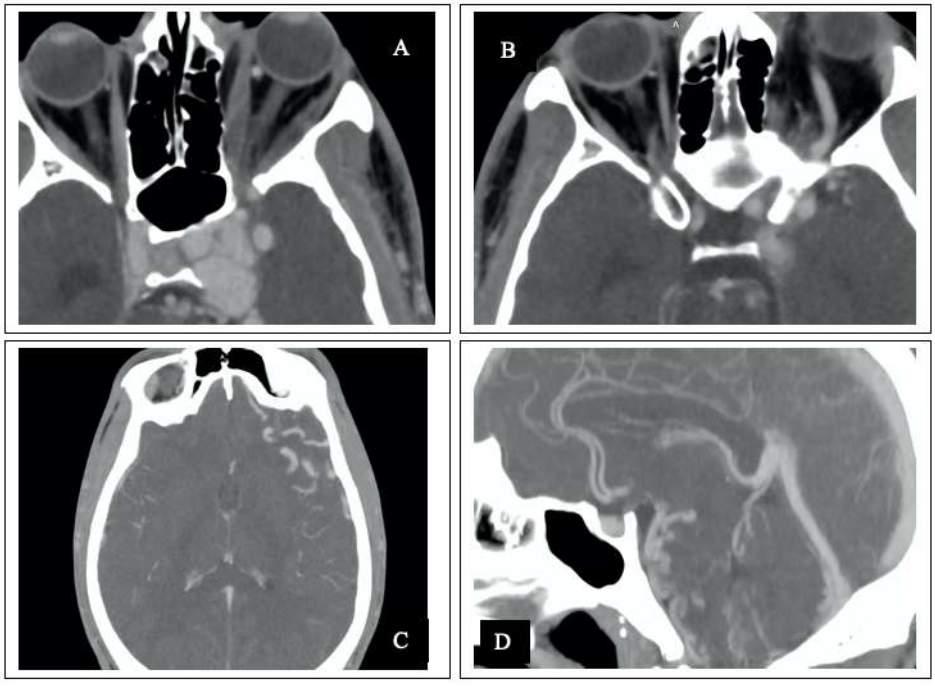

Fig-2: Cerebral angio-CT scan

A-Dilation and opacification in the arterial phase of the left cavernous sinus veins associated to a thickening of oculomotor muscles, B-Dilatation of the superior ophthalmic vein, C- Dilation of the cortical veins, D- Opacification in the arterial phase of the cerebral venous sinuses associated to a dilatation of prepontic and peribulbar veins.

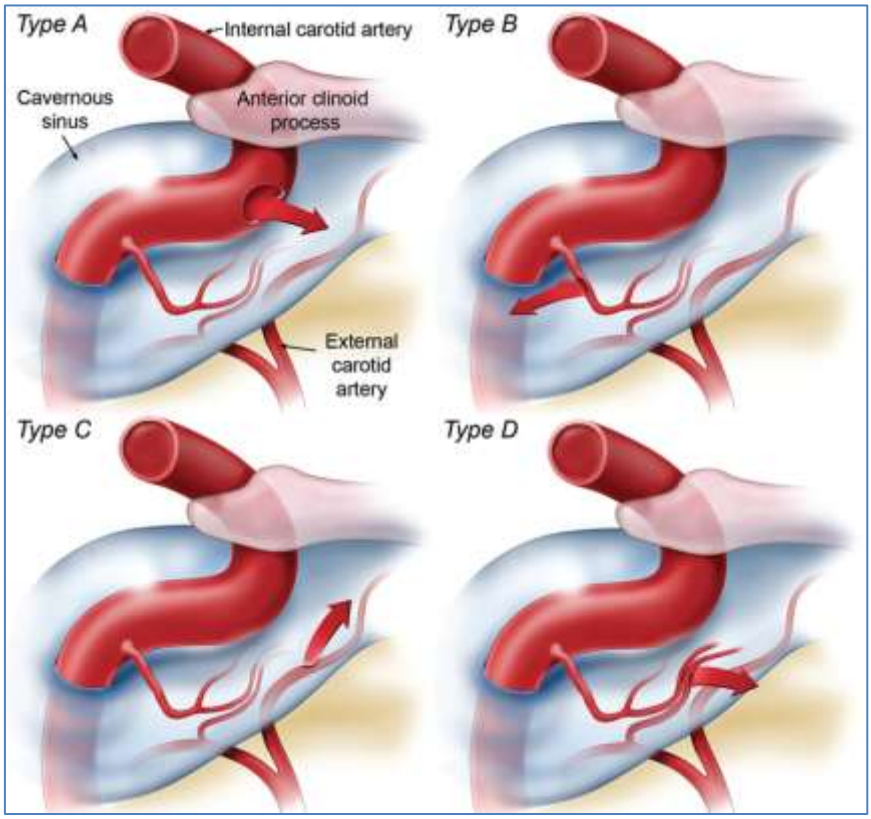

Fig-3: Barrow classification of CCFs [8]

REFERENCES

1. Chi CT, Nguyen D, Duc VT, Chau HH, Son VT. Direct traumatic carotid cavernous fistula: angiographic classification and treatment strategies study of 172 cases. Interventional Neuroradiology. 2014 Jul;20(4):461-75.
2. Guimarães AC, De Carvalho GM, Chone CT, Pfeilsticker LN. Carotid cavernous fistula: a rare complication of maxillofacial trauma. Head and Neck Oncology. 2014.
3. McManus NM, Offman RP, Provatas TL, Sievertsen EE. An Eye with a Heartbeat: Carotid Cavernous Fistula–a Case Report. The Journal of emergency medicine. 2018 Sep 1;55(3):e75-6.
4. Moutei H, Abdellaoui M, Younes S, El Hassani R, Benatiya IA, Tahri H. Fistule carotido-caverneuse post-traumatique: à propos de 2 cas. Journal Français d'Ophtalmologie. 2016 Sep 1;39(7):e171-2.
5. Martin S, Teo M, Bhattacharya J, Alakandy L. Carotico-cavernous fistula: An educational case. International journal of surgery case reports. 2013;4(10):858.
6. Dietemann JL, Zöllner G, Froelich S, Chapitre 13 - Pathologie latérosellaire, in: J.-L. Dietemann (Ed.), Neuro-Imag. Diagn. Trois. Édition, Elsevier Masson, Paris. 2018: 467-485.e3. https://doi.org/10.1016/B978-2-294-75394-7.00013-8.
7. Héran F, Lafitte F. Imagerie en ophtalmologie pour les radiologues: Oeil, orbite, vision, oculomotricité. Elsevier Health Sciences; 2018 Oct 16.
8. McManus NM, Offman RP, Provatas TL, Sievertsen EE. An Eye with a Heartbeat: Carotid Cavernous Fistula–a Case Report. The Journal of emergency medicine. 2018 Sep 1;55(3):e75-6.