

Carotid cavum aneurysm treated with Solitaire™ AB stent. Case report

Aneurisma del cavum carotídeo tratado con stent Solitaire™ AB. Reporte de caso

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Abstract

Background: In the cavum segment, the internal carotid artery has more susceptibility formation of aneurysms. The Solitaire™ AB stent is a scaffold that do flow blood diversion and promotes the aneurysms exclusion by thrombosis. **Case report:** A 63-year-old female present pulsatile headache, diplopia, III left cranial nerve paresis, and carried a cavum carotid saccular aneurysms of the left carotid artery. By endovascular procedure, we placed a Solitaire™ AB stent. She recovered the III left cranial nerve function in to 2 months and we observed exclusion of the aneurysms by DynaCT in 3 months. **Conclusion:** The reconstruction of an artery by endovascular therapy is an alternative treatment for no ruptured paraclinoid aneurysms.

Keywords: Aneurysm. Cavum carotid. Solitaire™ AB stent. DynaCT.

Resumen

Antecedentes: La arteria carótida interna a nivel del cavum es más susceptible de formación de aneurismas. El Solitaire™ AB condiciona una redirección del flujo de la sangre que favorece la exclusión por trombosis del aneurisma. **Caso clínico:** Mujer de 63 años que presentó cefalea, diplopía, paresia del III nervio craneal y portadora de aneurisma sacular en la arteria carótida interna izquierda a nivel del cavum carotídeo. Se colocó una endoprótesis Solitaire™ AB por procedimiento endovascular. Recuperó la función del III nervio craneal izquierdo a los 2 meses y se observó la exclusión del aneurisma a los 3 meses por DynaCT. **Conclusión:** La endoprótesis para reconstrucción arterial intracraneal es una alternativa terapéutica en aneurismas paraclinoideos no rotos.

Palabras clave: Aneurisma. Cavum carotídeo. Endoprótesis Solitaire™ AB. DynaCT.

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Introduction

The carotid cave is a small recess that extends from the proximal to the distal dural ring, between the portion of the carotid collar in front of the sulcus at the posteromedial part of internal carotid artery wall, described by Kobayashi^{1,2}.

The internal carotid is compromised at the level of the siphon due to its S-shape, including the cavernous and paraclinoid segments. The carotid siphon has two curves, and a complex hemodynamic profile is, therefore, generated, with distribution of stress not being uniform on the wall, which is highly abnormal and favors the formation of aneurysms³.

Carotid cave aneurysms belong to the small subgroup of intradural internal carotid artery aneurysms; they grow in a small dural recess with the roof toward the cavernous sinus. These aneurysms can extend into the intracavernous space and create problems at surgery⁴. Carotid cave aneurysms are considered Type IIIb paraclinoid aneurysms of the Barami classification, and can be associated with ipsilateral visual loss, or only impaired light perception, and develop transient paresis of the third ipsilateral cranial nerve, which can resolve 6 months after surgery⁵.

At present, endovascular therapy is a treatment possibility for intracranial aneurysms due to its efficacy and safety profile. Blood flow diversion is a feasible and safe technique, the concept of which consists of endoluminal reconstruction of the diseased artery and aneurysmal neck, with the aneurysm being excluded from circulation⁶. Blood flow stasis in aneurysms induces an inflammatory response, followed by thrombosis and healing, while the stent acts as a scaffold for neointimal proliferation and remodeling of the vessel of origin⁷⁻¹⁰.

The Solitaire™ AB stent is designed with closed cells, is self-expandable for intracranial vessels, is retrievable, and is detached by electrolysis after being released¹¹.

Clinical case

A 63-year-old woman presented with a history of rheumatoid arthritis on treatment. She presented with a 2-week history of pulsatile holocranial headache accompanied by diplopia. Neurological examination revealed third left cranial nerve paresis, with no further alterations. Imaging studies including cerebral digital

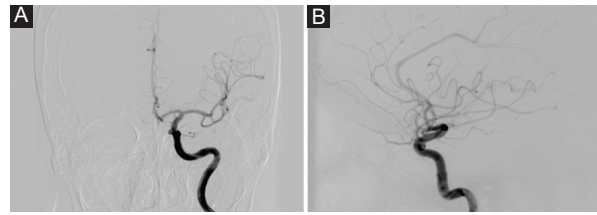


Figure 1. A and B: cerebral digital subtraction angiography in which a small wide-necked sacular aneurysm is observed at the level of the carotid cave with ventromedial direction.

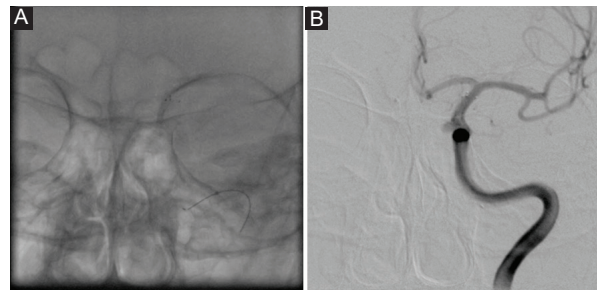


Figure 2. A and B: the released stent is observed positioned from left internal carotid artery C4 to C7 segment.

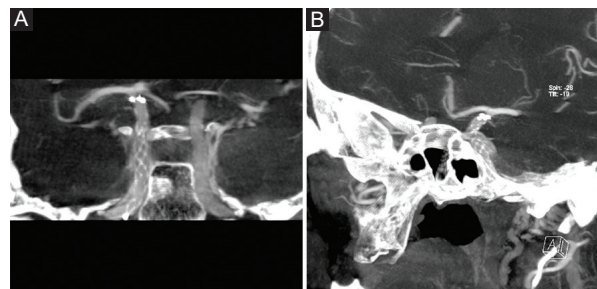


Figure 3. A and B: DynaCT angiography in which the reconstructed internal carotid artery and excluded aneurysm are observed.

subtraction angiography were performed, with a small Barami Type IIIb broad-necked sacular aneurysm being identified (Fig. 1).

With intravenous antiplatelet aggregation (tirofiban), a 4 × 30-mm Solitaire™ AB stent was placed (Fig. 2).

The patient recovered third left cranial nerve full function at 2 months. On follow-up with DynaCT examination, we observed the aneurysm exclusion at 3 months (Fig. 3). The patient was managed with dual oral antiplatelet therapy (acetylsalicylic acid 100 mg and clopidogrel 75 mg every 24 h) for 3 months and continued with single oral antiplatelet therapy (acetylsalicylic acid 100 mg every 24 h).

Discussion

Carotid cave aneurysms involve more complexity for surgery because they require clinoidectomy and dural rings opening. Placement of a stent decreases the hemodynamic stress exerted on the aneurysm wall by blood flow redirection.

Intracranial stents act as scaffolds over diseased arterial walls. Solitaire™ AB is the first retrievable stent with higher release accuracy, and it is highly navigable, even in small vessels, for the treatment of aneurysms¹²⁻¹⁴.

In this patient, the use of a stent as a scaffold in the reconstruction of the artery at the level of the aneurysm favored its exclusion^{13,15-18}.

Subsequent evaluations of intracranial stents remain a challenge. DynaCT imaging is the best modality for evaluating intracranial vessels luminal patency after a stent is placed; fewer artifacts are observed and it allows stent lumen visualization in very small intracranial vessels (> 3 mm)¹⁹⁻²².

Conclusion

Solitaire™ AB stent cells within the diseased artery alter the hemodynamic parameters within the aneurysm, thus favoring thrombosis²³⁻²⁵.

Its use is safe for reconstruction of the artery. As the aneurysm gradually undergoes thrombosis, this device acts as a scaffold within the artery, is lined by endothelium, and causes for the aneurysm to be excluded from circulation¹³.

Endovascular treatment is an effective and safe therapeutic alternative in ruptured and non-ruptured paraclinoid aneurysms²⁶⁻²⁸.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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Ethical disclosures

Protection of human and animal subjects. The authors declare that the procedures that were followed adhered to the ethical standards of the

responsible committee for experimentation on human subjects and were in agreement with the World Medical Association and the Declaration of Helsinki.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained informed consent from the patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

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