

ENDOVASCULAR TREATMENT OF A BASILAR ARTERY DISSECTING ANEURYSM

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ABSTRACT - Basilar artery (BA) dissecting aneurysms pose difficulties to treatment because both bleeding and thrombosis can happen in the same patient, clinical course is unpredictable and high morbidity is usual. We report the case of a 37-year-old woman with a BA aneurysm probably caused by arterial dissection, presenting embolic and hemorrhagic complications. The aneurysm was submitted to endovascular treatment with stenting and coil embolization. Clinical and radiological results were excellent and no complications were observed, suggesting that BA stenting and coil embolization may be a safe and effective treatment for this condition.

KEY WORDS: basilar artery dissection aneurysm, endovascular treatment, stenting, coil embolization.

Tratamento endovascular de aneurisma dissecante da artéria basilar

RESUMO - Aneurismas associados a dissecção da artéria basilar (AB) apresentam dificuldades terapêuticas, pois sangramentos e fenômenos trombóticos podem ocorrer no mesmo paciente, seu curso clínico é imprevisível e sua morbidade, alta. Relatamos o caso de uma paciente de 37 anos com aneurisma de artéria basilar provavelmente causado por dissecção arterial, apresentando-se com complicações hemorrágicas e embólicas. O aneurisma foi submetido a tratamento endovascular com colocação de "stent" e embolização com molas. Os resultados clínico e radiológico foram excelentes e nenhuma complicação foi observada, sugerindo que o tratamento dos aneurismas de AB dissecantes com colocação de "stent" e embolização com molas possa ser seguro e eficaz.

PALAVRAS-CHAVE: aneurismas associados a dissecção da artéria basilar, tratamento endovascular, embolização com molas, "stent".

Dissecting aneurysms represent up to 28% of aneurysmal abnormalities involving the intracranial vertebral artery (VA) and its branches. In contrast, basilar artery (BA) dissection seems to be rare^{1,2}, presenting more frequently with brain stem ischemia and rarely with subarachnoid hemorrhage³⁻⁶. This lesion carries significant mortality and morbidity. Fatal rebleeding may occur in 19% of BA dissecting aneurysms that present with subarachnoid hemorrhage^{1,6}. In addition, bleeding may complicate BA dissections presenting initially with brain ischemia. The risk is greater within the first 24 hours and rebleeding is less likely to occur after 2 weeks. In some cases, the lesion may even show spontaneous regression.

Because of their rarity, the management of BA dissecting aneurysms is controversial and challenging, as illustrated by the case we report, the patient give informed consent for publication this case report.

CASE

A 37-year-old woman reported a sudden sensation in the occipital region described in her words as a "dilating vein in the head" seven days before being admitted. The sensation lasted for a few hours and was followed by nausea and right homonymous hemianopsia. She had a history of migraine without aura since adolescence and her sister had a myocardium infarct at the age of 22.

CT demonstrated an ischemic infarction in the left occipital lobe. Cerebrospinal fluid was xanthochromic and analysis revealed 1200 red cells. MRI showed the previous lesions and a left cerebellar infarction (Fig 1). MRA revealed a severe stenosis followed by dilatation in the middle portion of the basilar artery. Digital subtraction angiography (DSA), ten days after the ictus, showed a BA focal severe stenosis followed by dilatation and tight stenosis, suggesting a BA aneurysm caused by spontaneous dissection (Fig 2). Other slight stenoses were present in the middle and distal portions of the BA. The patient was submitted to endovascular treatment with BA stenting and aneurysm coil embolization.

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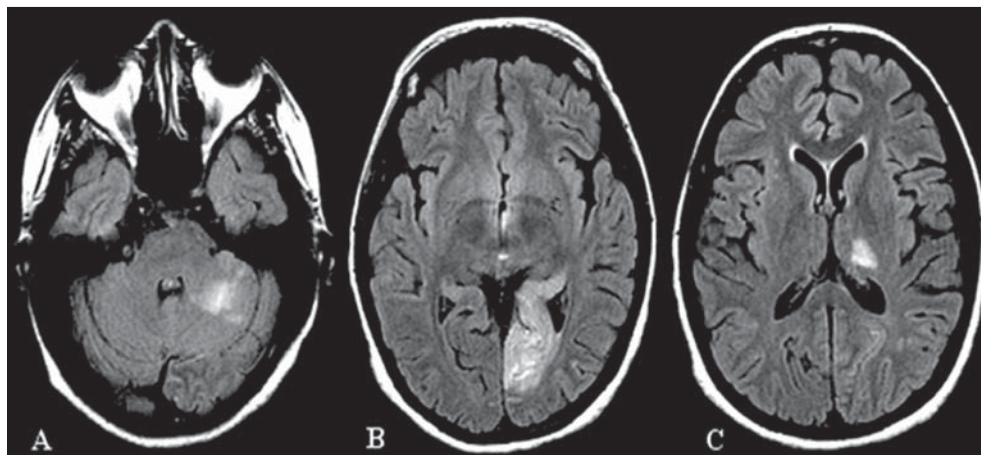


Fig 1. MRI (FLAIR image) shows infarcts in the left middle cerebellar peduncle and cerebellar hemisphere (A), occipital lobe (B) and thalamus (C).

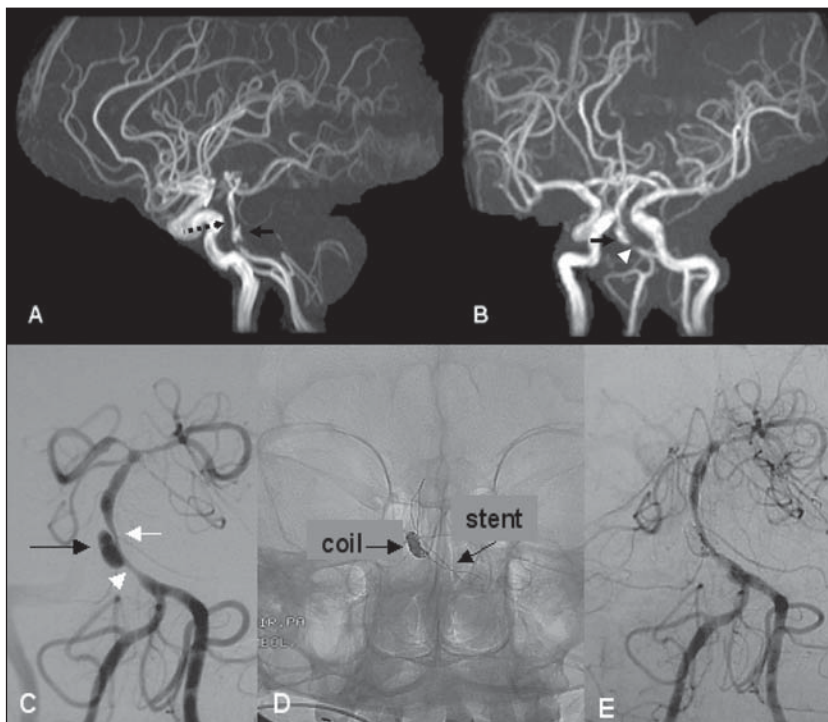


Fig 2. MRA (A, B) and DSA (C, D, E) shows proximal (white arrowhead, B and C) and distal (black dotted arrow, A and white arrow, C) focal stenosis and dilatation (black arrow; A, B and C) in the middle portion of the basilar artery before endovascular treatment (C) with stenting and coiling (arrows, D). Good angiographical result after treatment (E).

lization without complications. During the procedure she received tirofiban, 0.6 mg intra-arterial bolus and 6.6 mg intravenous infusion for twelve hours. Afterwards, unfractionated heparin and clopidogrel 75 mg qd were given for seven days and then heparin was substituted by aspirin 100 mg qd. One month later, clopidogrel was discontinued and aspirin dose was increased to 300 mg qd.

The neurological examination remained unchanged on discharge compared to patient admission. Two months later, no complications were observed. The NIH Stroke Score was 2 and the Modified Rankin score was 1. Six months later, DSA was repeated and showed the same good results. One a year after symptom onset, the neurological examination is unchanged.

DISCUSSION

Three options should be considered when dealing with basilar artery aneurysms: conservative management, surgical treatment and endovascular intervention. The first one should be considered in patients with ischemic stroke without evidence of bleeding and without aneurysm formation. On the other hand, early intervention should be considered in patients with hemorrhage or aneurysms⁶. The three surgical options currently available are wrapping, proximal ligation and arterial reconstruction by direct surgical clipping. The efficacy of the first modality is un-

proven, and there are only anecdotal descriptions of the other techniques in treatment of BA lesions. The poverty of information about surgical procedures can be justified by the difficult or sometimes impossible access to the BA. Endovascular approach of BA dissection relayed in the past on occlusion of the parent vessel⁶⁻⁸. Subsequently, the development of appropriate stents for intracranial arteries led to good results, first in BA fusiform aneurysms unrelated to dissection⁹ and later, in BA dissections^{10,11}. Endovascular treatment of intracranial dissection aneurysms has been previously described. However, there has been limited experience on successful treatment of BA dissections complicated by aneurysms with stenting and coil embolization¹²⁻¹⁶. Good outcomes were reported after this procedure in only three cases^{9,13}.

In the presented case, excellent angiographic and clinical results have been obtained. Endovascular treatment was chosen because of its potential advantages. First, a stent redirects blood flow by disrupting inflow into the aneurysm from the parent vessel. This decreased inflow contributes to thrombosis of the aneurysm and also probably reduces the risk of the coils becoming compacted. Second, a stent supports coiling by "remodeling" the neck of an aneurysm and by preventing migration of coil loops from aneurysms, especially from wide neck aneurysms that otherwise could represent an obstacle to treatment. Finally, a stent also provides a matrix for endothelial growth. The luminal surface of the stent is covered by a layer of neointima and the segment from which the aneurysm arises is thereby remodeled^{11,17-20}. The approach to posterior circulation arteries by endovascular devices is quite direct and now there are available new, auto-expandable stents designed for intracranial use.

However, some cautions must be taken into account. First, stents may induce intimal hyperplasia and especially in smaller branches this could lead to significant stenosis. Second, as stents are potentially thrombogenic, anticoagulation during the procedure and long-term antiplatelet prophylaxis may be necessary and could represent an additional risk in the setting of subarachnoid hemorrhage. To avoid this risk, aneurysm access with a catheter to provide coil deployment was guaranteed before placing the stent. Third, in theory occlusion of ostia of small perforating branches, especially along the basilar trunk, could be complicated with ischemic events, although this has not been common in animal models^{13,18}.

In conclusion, BA dissecting aneurysms pose dif-

ficulties to treatment because both bleeding and thrombosis can happen in the same patient, clinical course is unpredictable and high morbidity is usual. No complications were observed in the presented case suggesting that BA stenting and coil embolization may be a safe and effective treatment for this condition.

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