Vertebral artery dissecting aneurysm

The mortality rate after subarachnoid hemorrhage (SAH) due to the rupture of vertebral artery dissecting aneurysms (VADAs) is high; endovascular coil trapping is the first-line therapy to prevent rerupture. For the selection of optimal treatments, the positional relationship between the VADA and posterior inferior cerebellar artery (PICA) and the morphology of the contralateral VA must be considered, and outcome predictors of different treatment methods and their possible complications must be identified.

Methods: We retrospectively studied 44 patients with ruptured VADAs; they had undergone endovascular or surgical treatment at our institutes. On conventional preoperative angiograms the VADA morphology was assessed and the VADAs were categorized based on their site vis-à-vis the PICA. We used the VADA site, the treatment method, and complications to identify prognostic factors.

Results: The 44 VADA sites were PICA-proximal (PICA-p, n=3) or distal (PICA-d, n=22); in 7 the PICA was absent (PICA-a) and in 12 patients the PICA was involved (PICA-i). The treatments were internal coil trapping (n=30), proximal coil-occlusion (n=5), and stent (n=3); 6 were subjected to surgical flow alteration via an occipital artery (OA)-PICA bypass and ligation at the proximal VA and the PICA origin. Periprocedural rebleeding was associated with a poor outcome. Internal coil trapping prevented the rerupture of PICA-p and PICA-a aneurysms, as did flow alteration in PICA-i VADAs; there were no complications directly attributable to these procedures.

Conclusions: Periprocedural rebleeding was a poor prognostic factor. Internal trapping of PICA-p and PICA-a aneurysms and flow alteration in PICA-i VADAs prevented rerupture [1)].

Spontaneous vertebral artery dissecting aneurysm has been increasingly attributed as a major cause of focal neurological deficits due to vertebrobasilar artery ischemia or subarachnoid hemorrhage (SAH). Although the development of spontaneous vertebral artery dissecting aneurysm (VADA) is rare, de novo VADA after treatment of contralateral vertebral artery (VA) is more less frequently observed. There are only a few reports related to de novo VADA after treatment of the contralateral VA in the medical literature. The mechanisms responsible for de novo dissection after treatment of unilateral VADA are still not clearly understood. In this manuscript, we report an unusual case of a patient with a de novo VADA after placement of a pipeline embolization device (PED) stent on the contralateral VA along with a thorough review of the literature. A 42-years old male patient was referred to the hospital with sudden onset of dizziness, nausea, and vomiting. Initial digital subtraction angiography (DSA) images demonstrated a VADA in the fourth segment of the left VA without the involvement of the posterior inferior cerebellar artery (PICA). There were no significant abnormalities found in the right vertebral artery. He underwent an endovascular pipeline embolization to treat the dissecting aneurysm (DA). Surprisingly, follow-up DSA imaging 14 months after the initial treatment showed a segmental dilatation and narrowing of the right VA, which suggested a de novo VADA on the right side that had occurred postoperatively. This was followed by a tent-assisted coil embolization therapy for occluding this de novo VADA. This patient showed an uneventful postoperative course with no neurological abnormalities. In addition to hemodynamic stress changes, the unique clinicopathological features of dissecting aneurysms may contribute significantly to the pathogenesis of de novo VA dissection. Given that VA in VADA patients may be vulnerable on both sides, it is important to consider the risk of de novo dissection after initial aneurysm treatment. The bilateral vertebral artery has to be carefully observed when treating any VADA patient to prevent any complications [2)].

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2)
You W, Feng J, Liu Q, Liu X, Lv J, Jiang Y, Liu P, Li Y. Case Report: De novo Vertebral Artery Dissection After Intravascular Stenting of the Contralateral Unruptured Vertebral Artery Aneurysm. Front Neurol. 2021 Apr 23;12:599197. doi: 10.3389/fneur.2021.599197. PMID: 33967933; PMCID: PMC8102744.