Salvage vertebral arteriotomy for micro guidewire retrieval in a patient with basilar artery stenosis, a rare case report

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Abstract

fracture-retention is a rare neuroendovacular guidewire (GW) Micro complication. A 59 female underwent endovascular treatment (EVT) for her basilar artery stenosis. GW fracture occurred in V3 segment of the vertebral artery. Several endovascular attempts failed to retrieve the GW. A far-lateral craniotomy and V3 arteriotomy was performed to wire retrieval. In follow up she had no complications. Microsurgery can be salvage treatment in such rare events.

Introduction

Guidewire (GW) complications such as knotting, looping, kinking, fragmentation, and entrapment are the reported unwanted events during neurointervention. There are a few case reports on the endovascular treatment (EVT) complications on GW fracture (1.2)

Discussion

Excessive rotational and repeated overextension forces can cause a physical breach in GW integrity, leading to mechanical failure and breakage of the wire.

Castano et.al reported 6 cases of an unwanted detachment of the Solitaire device during 262 mechanical thrombectomies. They have found such events are associated with symptomatic ICH, poor outcomes, and higher mortality rates(3).

Endoluminal retrieval, direct surgical removal, stenting over the detached wire, and other conservative treatments have been proposed for device retentions(4).

"Pull-push-pull" and "Monorail snare techniques" have been successfully used for device retention in AVM patients (5, 6).

Sub Lee et.al reported GW fracture in tortuous ICA during an ophthalmic artery aneurysm EVT. The broken micro guide wire was retrieved using Microsnare[™]. Their GW breakage occurred in an anterior communicating aneurysm. Microsnare[™] (Microvena, Boston Scientific, MA) failed to capture the broken GW. Then open aneurysm clipping was performed but due to lack of any flow disturbance, the microcatheter left to be inside the ICA lumen .The authors proposed tortuosity causes segmental fixation, lowers the GW torsion resistance, and finally causes GW breakage. (7). Similar justifications in cavernous ICA and VA have been reported in some studies as well(4).



Case presentation

A 59-year-old female with a history of vertebrobasilar insufficiency was referred for basilar artery (BA) stenting (Figure 1). After the Synchro® (Stryker Neurovascular[™], California, USA) wire navigation through the atherosclerotic stenosis, GW fracture occurred and distal segment remained in the V3-BA lumen(Figure 2). Multiple attempts, including Microsnare® application remained unsuccessful. There was V2-V3 extravasation. The patient received a heparin drip for 24 hours and was scheduled for far lateral craniotomy.

Using a classic far lateral approach, we gained access to the V3-BA segment of the vertebral artery, and a small arteriotomy on the V3 was performed (Figure 3). GW was retrieved and the patient was discharged for future re-stenting. There were no new post-operative events in the follow-up period.

Although there are few reports on device retention in AVM and even ICA cases, we hypothesized a dominant VA may display a different clinical course. Besides being a dominant supplier of the posterior circulation, having a great range of motion on the V3 zone might cause a possible VA perforation in such cases, emphasizing the importance of the device retrieval.

Conclusions

Despite the advances in EVT, complications occur during every procedure. Extreme caution should be paid in catheterization of the tortuous vessels. A rapid neurosurgical intervention can be life-saving to handle such complications.



Figure 1. preintervention oblique view angiogram showing basilar stenosis.

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Figure 2. AP angiogram image in the stenosis.

Figure 3. vessel perforation and GW fracture. Please notice the dye extravasation.

Figure 4. vertebral arteriotomy and GW retrieval.

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