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*Case Report*

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# Clipping of a Rebleeding Ruptured Aneurysm After Woven EndoBridge Treatment

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## ABSTRACT

**AIM:** To present the clipping of a ruptured aneurysm in the M1 segment of the right middle cerebral artery after rebleeding, which was treated with Woven EndoBridge (WEB).

**CASE REPORT:** A 68-year-old male patient with known hypertension, coronary artery disease and benign prostatic hypertrophy was admitted to our clinic after a ruptured aneurysm of 4.5 mm in the right middle cerebral artery M1 segment and subarachnoid hemorrhage were detected in the emergency room imaging after syncope at home. WEB device was placed into the aneurysm in the patient who was planned for endovascular treatment. After 3 days of the procedure, neurologic examination showed regression. In the brain computed tomography imaging, it was observed that there was an intraparenchymal hematoma of 4,5 cm in the right temporoparietal region and the aneurysm, which had been treated with endovascular WEB, was ruptured. The aneurysm was clipped in the patient for whom emergency surgical treatment was planned.

**CONCLUSION:** As a conclusion, re-bleeding can be seen after aneurysm treatment with the Web device. If it is planned to re-close the aneurysm treated with the web device with a surgical clip, the pressure created by the device against the vessel can be reduced with the additional clip.

**KEYWORDS:** Aneurysm, Rebleeding, Woven EndoBridge, WEB device

**ABBREVIATION: WEB:** Woven endobridge

## INTRODUCTION

Endovascular treatment methods have become the preferred methods in the treatment of intracranial aneurysms (11). The treatment of wide-necked bifurcation aneurysms may require complex stenting during coiling, and accordingly, procedure-related and post-procedure complications may be encountered. Woven EndoBridge (WEB) (Sequent Medical, California, USA), a device developed especially for wide-necked bifurcation aneurysms, is a mesh made of nitinol wires placed inside the aneurysm sac. It occludes the aneurysm sac and provides current circulation in the aneurysm neck. It is thought that such aneurysms can be treated with less manipulation, in a shorter time and with less complications (10). There are a limited number of publications in the literature regarding the long-term results of web device treatment in aneurysm and complications. In this case, we present the clipping of a ruptured aneurysm in the M1 segment of the right middle cerebral artery after rebleeding, which was treated with WEB.

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## CASE REPORT

A 68-year-old male patient with known hypertension, coronary artery disease and benign prostatic hypertrophy was admitted to our clinic after a ruptured aneurysm of 4.5 mm in the right middle cerebral artery M1 segment and subarachnoid hemorrhage were detected in the emergency room imaging after syncope at home. WEB device was placed into the aneurysm in the patient who was planned for endovascular treatment. The patient, who did not have any neuromotor deficits after the procedure, was followed up in the intensive care unit. After 3 days of the procedure, neurologic examination showed regression. In the brain computed tomography imaging, it was observed that there was an intraparenchymal hematoma of 4.5 cm in the right temporoparietal region and the aneurysm, which had been treated with endovascular WEB, was ruptured. The aneurysm was clipped in the patient for whom emergency surgical treatment was planned. Compression caused by intraparenchymal hematoma and consequent regression in neurological examination are the reasons for the emergency surgical procedure. Postoperative angiography showed complete closure of the aneurysm. The patient's neurological deficits recovered completely, and he was discharged.

## DISCUSSION

In the literature, Caroff et al. reported that bleeding complications developed in 5 patients in a multicenter study of 98 web-treated aneurysms. While one of these bleeding complications occurred intraoperatively, 4 were detected in the post-procedure follow-up (3). Clajus et al. reported rebleeding in 2 patients in their series where they treated 114 aneurysms of 108 patients (4). Lawson et al. reported late rebleeding in 3 patients treated with WEB (7). Mine et al. also reported a case that was completely occluded after WEB treatment, and then rebleed 2 years after the first bleeding (8). In these reported cases, unlike our case, no surgical intervention was planned for the aneurysm.

Spelle et al. and Bengzon Diestro et al., in their multicenter studies published in 2022, did not report rebleeding in aneurysms treated with the WEB device (2,12). In the meta-analysis of Essibayi et al., late bleeding was reported as 1.1% (95% CI, 0.1%–2.1%) (5). Harker et al. did not report rebleeding in their multicenter case series. However, in a meta-analysis of 309 web-treated aneurysms from 7 case series, they reported 2.5% (95% CI 1–5%) rebleeding (6).

In the publication of Mouchtouris et al., in which they presented a case series of 115 WEB-treated aneurysms in 110 patients in 2021, they reported that 6 patients needed retreatment. Clip ligation was preferred in 2 of these 6 patients (9). Unlike the case we presented, rebleeding was not reported in these 2 patients, and the decision to re-treatment was taken after follow-up angiography. Srinivasan et al. also reported that 30 of 342 WEB-treated patients needed re-treatment, and only 2 of these patients presented with rebleeding. They applied to primary clipping therapy in 6 patients who were re-treated (13). On the other hand, Abbas et al., in their single-center study, reported that 7 patients needed retreatment within a 6-year period, and 3 of these patients presented with subarachnoid hemorrhage (1).

In this case report, clipping of the aneurysm was preferred in the patient who had rebleeding in the early period. Even if complete closure is achieved after clipping the aneurysm, the neck of the aneurysm should be supported with an additional clip in order to reduce the risk of the pressure created by the WEB device into the vessel. Re-closure of the aneurysm with endovascular treatment could be considered as an alternative treatment. However, there was compression due to intraparenchymal hematoma. Therefore, endovascular treatment was not preferred. Long-term follow-up results have not been reported in the literature after surgical clipping of the aneurysm treated with a WEB device due to rebleeding.

## CONCLUSION

As a conclusion, re-bleeding can be seen after aneurysm treatment with the WEB device. If it is planned to re-close the aneurysm treated with the WEB device with a surgical clip, the pressure created by the device against the vessel can be reduced with the additional clip.

**AUTHORSHIP CONTRIBUTION**

Study conception and design: MCS, BK
Data collection: FO
Analysis and interpretation of results: MCS, BK
Draft manuscript preparation: MCS
Critical revision of the article: FO, BK
Other (study supervision, fundings, materials, etc...): BK
All authors (MCS, FO, BK) reviewed the results and approved the final version of the manuscript.

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