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Case Report

Stent-assisted modified coil protection technique for bilobulated aneurysm: technical note

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ARTICLE INFO

Article history:

Received 12 September 2016
Received in revised form
18 October 2016
Accepted 23 October 2016
Available online xxx

Keywords:

Aneurysms
Stent
Recanalization
Occlusion
Coiling

ABSTRACT

Endovascular treatment of deeply located bilobulated aneurysms in elderly patients is still challenging because of the acute angulation of the carotid siphon and poor microcatheter support. In particular, generating a frame coil to cover each lobe is difficult in bilobulated aneurysms with narrow isthmus in the fused portion. Here, we report a successfully treated bilobulated aneurysm using a modified coil protection technique with stent assistance.

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Introduction

Owing to advances in endovascular technologies, coil embolizations of intracranial aneurysms have been increasingly performed. Nevertheless, deeply located bilobulated aneurysms in elderly patients are still challenging to treat because of the acute angulation of the carotid siphon and poor microcatheter support. Generating a frame coil to cover each lobe is particularly difficult in bilobulated aneurysms with narrow isthmus in the fused portion. In this report, we describe a successfully treated bilobulated aneurysm using a modified coil protection technique with stent assistance.

Case report

An 85-year-old female presented with sudden-onset headache. Her past medical history included hypertension, diabetes mellitus, and long-term kidney disease at stage III. Brain computed tomography showed subarachnoid hemorrhage with intraventricular hemorrhage (Fig. 1A). Magnetic resonance imaging showed bilobulated aneurysms at the origin of the posterior communicating artery (Fig. 1B). Magnetic resonance angiography reveals tortuous brachiocephalic and internal carotid arteries on the right side. A catheter angiography revealed bilobulated aneurysm of the posterior

Acknowledgments: This study was supported by BioGreen 21 (PJ01121401) of the Rural Development Administration. The authors thank Sung-Eun Kim for her help with data review and image preparation.

Competing Interests: The authors have declared that no competing interests exist.

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<http://dx.doi.org/10.1016/j.radcr.2016.10.024>

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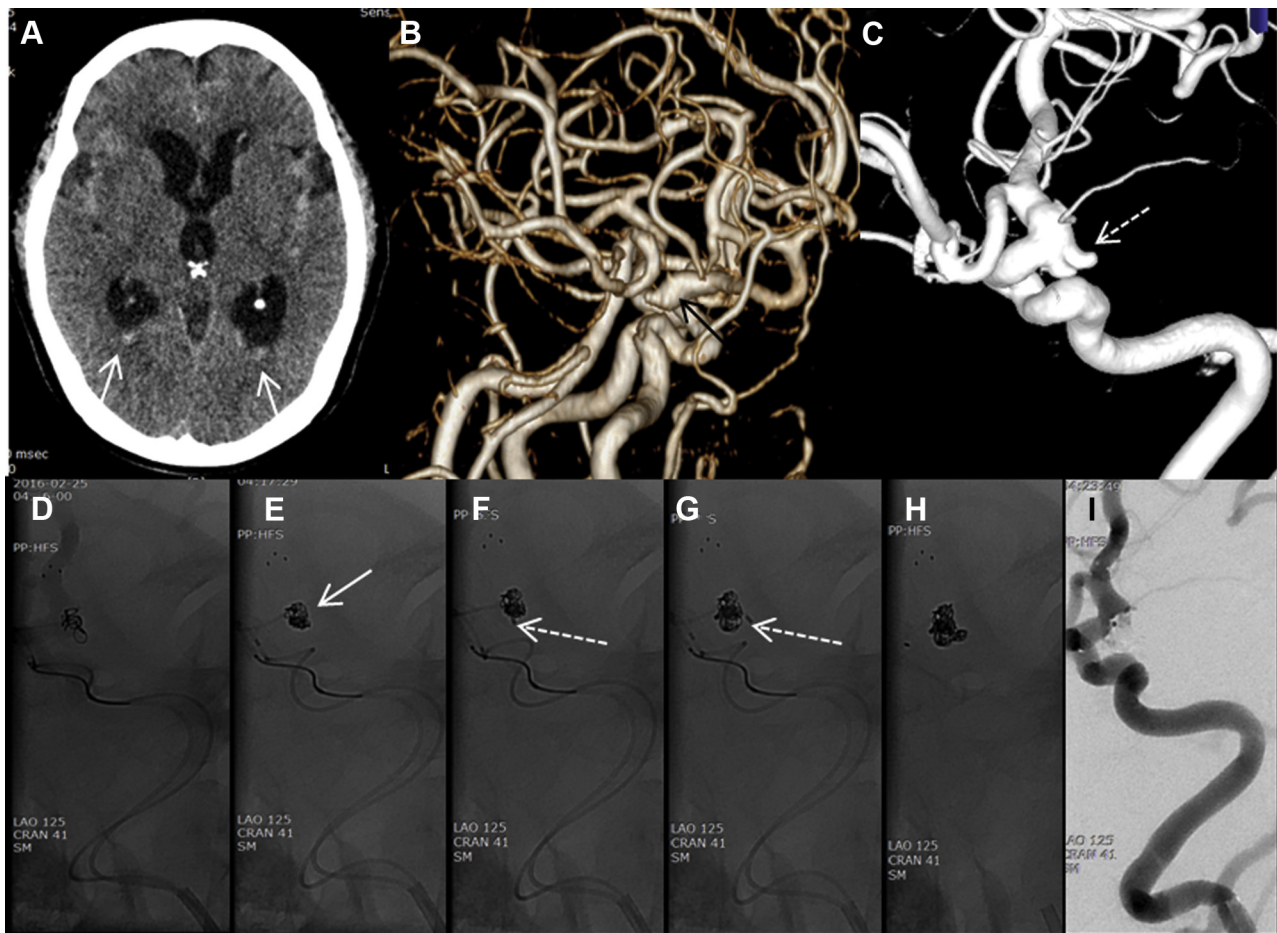


Fig. 1 – (A) Brain computed tomography shows subarachnoid hemorrhage with intraventricular hemorrhage (white arrows). (B) Magnetic resonance angiography showed aneurysmal dilatation of the posterior communicating artery (black arrow). (C) Rotational 3-dimensional angiography reveals bilobulated aneurysm of posterior communicating artery (white dotted arrow). (D) After deployment of a 4 mm × 20 mm solitaire FR stent, jailing or coil through techniques using 2 mm-3 mm sized MICRUSPHERE CERECYTE coils were attempted to fill the upper or lower lobes of the aneurysm, but failed. (E) Instead of deploying a coil in each lobe first, a framing coil was placed at the isthmus of the fused portion of the bilobulated aneurysms using a 2 mm × 2.5 cm MICRUSPHERE CERECYTE coil (white arrow). (F and G) A microcatheter was positioned at the lower lobe and upper lobes sequentially and additional coils were inserted (dotted white arrows). (H and I) Subtotal occlusion was achieved with minimal contrast filling of the aneurysm neck.

communicating artery. The size of each lobe was 4.3 mm × 2.3 mm and 3.3 mm × 2.5 mm, respectively (Fig. 1C). Coil embolization was performed according to the previously reported method [1]. The initial plan was to place the coil in one lobe of the aneurysm. However, because of the acute angulation of the carotid siphon and poor microcatheter support, the first coil protruded into the parent artery. After deployment of a 4 mm × 20 mm Solitaire FR stent (ev3, Irvine, CA), jailing or coil through techniques [2] using 2 mm-3 mm MICRUSPHERE CERECYTE coils (Codman Neuro, MA) were attempted, but failed due to poor catheter support (Fig. 1D). Instead of first deploying a coil in each lobe, we placed a structural frame at the isthmus of the fused portion of the bilobulated aneurysms using a 2 mm × 2.5 cm MICRUSPHERE CERECYTE coil (Fig. 1E). Then, the microcatheter was positioned at the lower lobe and upper lobe sequentially and

additional coils were inserted (Figs 1F and G). Subtotal occlusion was achieved with minimal contrast filling of the aneurysm neck (Figs 1H and I). The patient was discharged without neurological deficits.

Discussion

Bilobulated aneurysms remain technically challenging for endovascular treatment due to the difficulty in building a frame coil confined to each lobe of the aneurysm. For our patient, several techniques can be considered in terms of the number of microcatheters used or balloon remodeling or stent assistance. First, simple coiling using a single microcatheter can be considered. Kwon et al [3] described detailed strategy for deeply bilobulated aneurysms using a single catheter.

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