

Endovascular Treatment for Isolated Dissecting Aneurysm of The Pericallosal Artery Presenting with Spontaneous Subarachnoid Hemorrhage: A Case Report

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Dissecting aneurysms of intracranial artery often arise in the posterior circulation, but those in the anterior circulation are rare, presenting with hemorrhagic event. So, we report an unusual case of isolated dissecting aneurysm of the pericallosal artery presenting with spontaneous subarachnoid hemorrhage. A 46-year-old hypertensive woman presented with severe headache and intense nuchal rigidity after onset of two days. Brain CT scan revealed a subarachnoid hemorrhage and an interhemispheric hematoma. This was due to dissecting aneurysm of left pericallosal artery on conventional cerebral angiography. Total occlusion of the dissecting aneurysm was performed with five Guglielmi detachable coils, with no apparent procedure-related complications. Endovascular treatment by aneurysm and parent artery occlusion is a relatively reliable alternative to surgery for isolated dissecting aneurysm of pericallosal artery.

Key Words : Dissecting aneurysm; Pericallosal artery; Subarachnoid hemorrhage; Endovascular treatment

Dissecting aneurysm manifesting subarachnoid hemorrhage had been found in the posterior circulation such as vertebral artery in majority cases, but reported cases in the anterior circulation was rare. Those located in the anterior circulation usually manifest as ischemic stroke resulting from arterial stenosis or occlusion.

However, spontaneous subarachnoid hemorrhage in these cases is rare. So, we report a case of dissecting aneurysm of pericallosal artery presenting with spontaneous subarachnoid hemorrhage, as treated with endovascular occlusion by Guglielmi Detachable Coil (GDC).

CASE REPORT

The patient was a 46-year-old woman with history of hypertension. She developed over several minutes an acute, severe headache, so suspected spontaneous subarachnoid hemorrhage. The neurologic examinations on admission, the mental status was mild drowsy, and Glasgow Coma Scale was measured as fourteen. Initial brain computerized tomography (CT) scan at emergency room showed diffuse subarachnoid hemorrhages in the basal cistern, the bilateral Sylvian fissure, and a large hematoma in the interhemispheric

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Received June 5, 2010;

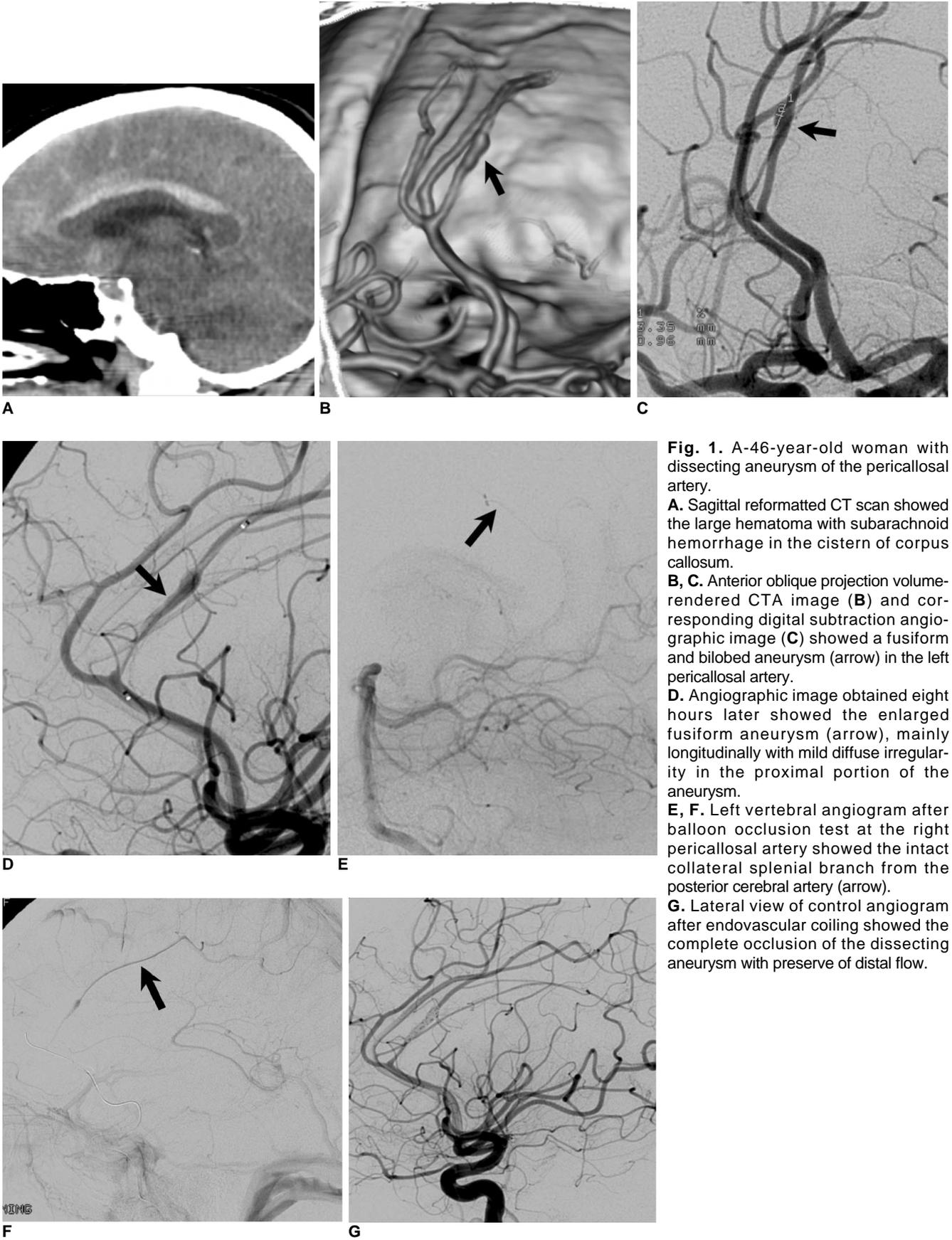
accepted after revision July 28, 2010.

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Neurointervention 2010;5:115-118



fissure area. Sagittal reformatted CT represented the subarachnoid hemorrhage in cistern of corpus callosum, suggesting an aneurysm in the anterior cerebral artery (Fig. 1A). CT angiography of the brain and four-vessel cerebral digital subtraction angiography showed a 3-mm fusiform and bilobed aneurysm of the left pericallosal artery (Fig. 1B, C). A control angiogram obtained eight hours later showed that the fusiform aneurysm had enlarged as 8-mm considerably, mainly longitudinally, consistent with a dissecting aneurysm (Fig. 1D). The proximal portion to dissecting aneurysm showed mild diffuse irregularity. When on the basis of anatomy, potential lack of sufficient collaterals was suggested, a preprocedural balloon occlusion test was performed by using 4 × 7-mm HyperForm™ balloon (eV3; Neurovascular, Irvine, California, U.S.A) at the right pericallosal artery to determine the feasibility of an endovascular approach. After ballooning in the right pericallosal artery, the splenic branch of the posterior cerebral artery was identified as a collateral on the delayed left vertebral angiogram (Fig. 1E, F). It was considered as tolerable balloon occlusion test. Via the transfemoral route, a Echelon™-10 microcatheter (eV3; Neuro-vascular, Irvine, California, U.S.A.) was advanced coaxially through a 7F guiding catheter to the proximal part of the left pericallosal artery. Total five GDCs were placed in the aneurysm to occlude the dissecting lumen, and both parent artery and aneurysm were occluded (Fig. 1G). No post-procedural complication was shown. Recovery of the patient was uneventful and she had no permanent or late ischemic brain symptoms, so she was discharged two weeks later without neurologic deficit.

DISCUSSION

The etiology of intracranial dissecting aneurysm includes Guillain-Barre syndrome, fibromuscular dysplasia, moyamoya disease, polyarteritis nodosa, migraine, and vascular wall abnormality caused by systemic hypertension (1–3). According to the previous report, the majority of these involve the posterior circulation, presenting with subarachnoid hemorrhage, and having the risk of repeated rupture within the first 24 hours (4–6). Those located in the anterior circulation is rare, and usually manifest as ischemic stroke resulting from arterial stenosis or occlusion by sequelae of subintimal dissection of vessels. However, spontaneous subarachnoid hemorrhage in these cases is rare. Only 14% of the dissections causing subarachnoid hemorrhage were

located in the anterior circulation (1, 5, 7). Hemorrhagic events from aneurysmal rupture of the distal anterior cerebral artery are resulted from non-penetrating trauma accounted for 62%. This causes are due to a shearing force between the inferior margin of the falx cerebri and the distal anterior cerebral artery (8), but spontaneous rupture of the pericallosal artery is rare phenomenon. The dissecting aneurysms that result in ischemic stroke can be managed nonsurgically because of good outcome, but therapeutic surgical intervention should be considered for cases manifesting as hemorrhagic events (4, 9). The surgical treatment is required during the early stage because of the high risk of rebleeding within 24 hours with prevention of rapid progression of the dissection. Depending on the location of the aneurysm and the collateral blood flow, wrapping, resection of the aneurysm, proximal occlusion, and trapping with or without end-to-end anastomosis are the choices of surgical treatment. Among this method, the trapping or proximal ligation of the parent artery is the treatment of choice in acute phase, but endovascular or other approach is considered to be alternative to surgical method in the case of vascular flexibility or poor blood supply (4, 6). In these cases, prompt revascularization is required. Recent trend of endovascular method represents occlusion of dissecting aneurysm and parent artery by coil or stent. Detachable coils have been used in the treatment of the intracavernous internal carotid aneurysms, dural and traumatic carotidocavernous high-flow fistulas, including the saccular aneurysms. Advantages of the detachable coils are the predictability and controllability of the coils before detachment (10), and the recent advancement in endovascular tools such as stents or balloons enables us to accurately select the length of segment for occlusion with accuracy similar to that in the surgical trapping. As like this case, the procedure offers the benefit to determine the feasibility of endovascular approach by demonstration of the collaterals.

We reported a rare case of a pericallosal dissecting aneurysm that presented with spontaneous subarachnoid hemorrhage. The endovascular treatment of pericallosal dissecting aneurysm may be an effective alternative to surgery, as determined by the angiographic demonstration of adequate collateral circulation.

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자발성 뇌지주막하출혈을 보인 뇌량주위동맥의 단일 박리성 뇌동맥류의 혈관내치료: 증례 보고

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뇌내혈관의 박리성 뇌동맥류는 주로 후두부순환에서 발생하며, 전두부순환에서 출혈성경향을 보이는 경우는 드물다. 이에 저자들은 자발성 뇌지주막하출혈을 보인 뇌량주위동맥의 박리성 뇌동맥류 1예를 보고하고자 한다. 46세 고혈압병력의 여자환자가 2일전부터 시작된 심한 두통 및 경부경직을 주소로 내원하였다. 뇌전산화단층촬영상 뇌지주막하출혈 및 뇌사이열내 혈종이 관찰되었으며, 뇌혈관조영술상 좌측 뇌량주위동맥의 박리성 뇌동맥류가 확인되었다. 5개의 Guglielmi 분리코일로 박리성 뇌동맥류의 완전색전술을 합병증없이 성공적으로 시행하였다. 이러한 박리성 뇌동맥류의 혈관내치료는 수술적치료를 대체할 수 있는 유용한 치료법으로 사료된다.

Key Words : Dissecting aneurysm; Pericallosal artery; Subarachnoid hemorrhage; Endovascular treatment