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좁고 구불구불한 후방 순환계의 뇌동맥류에 대한 두 개의 유도 도관을 이용한 코일색전술

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Double Guiding Catheter Technique for the Narrow and Tortuous Posterior Circulation Cerebral Aneurysm : A Case Report

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Abstract

When both of the vertebral arteries are tortuous or narrow, it is impossible to place the guiding catheter in the vertebral artery(VA). We present a case of ruptured basilar top aneurysm which was treated by coil embolization placing two guiding catheters at each origins of the VAs.

Key words : double guiding catheter, coil embolization

Introduction

The guiding catheter is essential for rigid support of the microcatheter. But when both of the vertebral arteries are tortuous or narrow, it is impossible to place the guiding catheter in the vertebral artery(VA). We solved this problem by double guiding catheters.

Case Report

A 48-year-old woman presented deep drowsy mental status after sudden bursting headache. Hunt-Hess grade was III. Brain computed tomography(CT) showed subarachnoid hemorrhage(SAH). Fisher grade was IV (Fig. 1). Three-dimensional CT angiogram revealed three aneurysms, distal anterior cerebral artery(ACA), right anterior

교신저자 : 박 용 석 주소 : 602-702 부산광역시 서구 암남동 34번지 고신대학교 의과대학 신경외과학교실 TEL: 051-990-6465, FAX: 051-990-3042 E-mail: ysparkns@kosinmed.ac.kr choroidal artery and basilar top (Fig. 2). Three-dimensional digital subraction angiography (3D-DSA) obtained immediately for more accurate visualization of the aneurysms and we decided to perform coil embolization of the basilar top aneurysm. Left vertebral angiogram with 6F guiding catheter showed the flow arrest and we removed the guiding catheter from the left VA (Fig. 3). Right vertebral angiogram with 6F guiding catheter and we removed the flow arrest and we removed the guiding catheter from the use two 5F guiding catheters for the each of the vertebral arteries(VAs).

A 5F guiding cather was placed at just origin of right VA via the right femoral artery. The other 5F guiding cather was placed at just origin of left VA via the left femoral artery. The images obtained after simultaneous VAs injection clearly depicted an basilar top aneurysm and adjacent vasular structures (Fig. 5). A microcatheter was navigated up the aneurysm through the left VA. Coiling was started via the left VA. Right vetebral angiogram was obtained after every each coilings (Fig. 6).



Fig. 1. Initial CT shows subarachnoid hemorrhage (Fisher grade IV).



Fig. 2. Three-dimensional CT angiogram reveals three aneurysms, distal anterior cerebral artery(ACA), right anterior choroidal artery and basilar top.



Fig. 3. Left vertebral angiogram with 6F guiding catheter shows the flow arrest due to the narrowness and tortuosity of the left VA.



Fig. 4. Right Vertebral angiogram with 6F guiding catheter also shows the flow arrest due to the narrowness and tortuosity of the right VA.



Fig. 5. Two 5F guiding catheter were placed at each origin of VAs. The images obtained after simultaneous VAs injection clearly depict the basilar top aneurysm and adjacent vascular structures.



Fig. 6. Right vetebral angiogram was obtained after 1st coiling(360° GDC, 11mm*30cm) via left VA.



Fig. 7. Final angiogram shows complete obliteration of basilar top aneurysm. The packing denstiy was 19%.

Seven GDC(Guglielmi Detachable Coils) 360° coils and three GDC Ultrasoft coils were deployed within the aneurysm and complete obliteration was achieved (Fig. 7). Total coil length was 194cm and the packing denstiy was 19%. The patient was treated additionally by coil embolization of the right anterior choroidal artery aneurysm and by clipping of distal ACA aneurysm. She fully recovered without any neurologic deficit.

Discussion

In coil embolization of a posterior circulation aneurysm, tortuosity or a small vessel caliber frequently prevents placement of a guiding catheter in the VA. Even in such difficult situations, however, coil embolization is the only treatment option when the patient's clinical condition is very poor, or the aneurysm is inaccessible by microsurgery.¹⁻⁶⁾

To perform coil embolization of an aneurysm in the posterior circulation safely, the surgeon must place the guiding catheter in the VA as close to the skull base as possible for rigid support of the microcatheter. However, in the posterior circulation, a small vessel caliber or elongation of the vessel orifice frequently prevents placement of the guiding catheter in the VA.

Many authors reported about this problem. Weill et al³⁾ solved this problem by direct puncture of the VA. Mathis JM et al⁴⁾ solved this problem by a guide catheter as a temporary stent. Bendok et al⁵⁾ solved this problem by transradial approach. Nishino et al⁶⁾ solved this problem by the modified buddy wire technique.

But because of discomfort to the patient and the relative difficulty of performing these procedure, recently proposed techniques are not familir to us. We solved this problem by double guiding catheters. This procedure was done by the most common access route, i.e. the transfermoral approach. Once two guiding catheters were placed at each of the VAs, a microcatheter was introduced to the aneurysmal sac by one guiding catheter and the other guiding catheter was used for angiography.

Failure to access the distal intracranial circulation with an over-the-wire microcatheter is most commonly encountered in a tortuous vascular system. The easy with which a microcatheter follows a guidewire through a tortuous system has been termed "trackability." Innovations in material technology, hydrophilic coating, and mechanical catheter design have, at least subjectively, greatly improved the trackability of microcatheter systems during the past several years.⁷⁰

Therefore, once guiding catheter is place at the orifice of VA stablly, we can navigate microcatheter up to the aneurysmal sac. During coil embolization of the aneurysm, the other giude catheter can be used for angiography or for microcatheter navigation.

Conclusions

We present a case of ruptured basilar top aneurysm which was treated by coil embolization placing two guiding catheters at each origins of the VAs. Double guiding catheter technique is helpful when both of the VAs are tortuous or narrow.

국문초록

양쪽의 추골 동맥이 모두 구불구불하거나, 혈관 내경이 모두 좁을 때에는 유도 도관을 추골 동맥 안에 설치할 수 가 없다. 저자들은 두 개의 유도 도관을 각각의 추골 동 맥 입구에 설치한 후에 기저 동맥 상위부 뇌동맥류를 코 일 색전술로 치료한 증례를 보고한다.

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