Endovascular Treatment of Large and Giant Intracranial Aneurysms with Use of Mixture Different Embolic Materials

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Intracranial aneurysm is a common condition but with a high mortality rate when rupture occurs. The treatment of ruptured or unruptured ICA, especially with an endovascular approach, has been evolving rapidly. The current generally accepted opinion suggests that endovascular embolization is an effective technique for preventing the recurrence of aneurysm rupture, but the rebleeding rate after endovascular embolization is found to be higher than that after surgical clipping. In addition, long-term follow-up data are required for the evaluation of the effectiveness of endovascular treatment in unruptured ICA. This review presents the selection of different treatment approaches, and in particular, the advances in endovascular embolization in the treatment of ICA, including mixture of variety of embolic materials such as coils, stents, ONYX and acrylates. The use of liquid embolic agents for embolization of cerebral aneurysms has been reported in the neurosurgical literature. The most important limitation of this technique is the relatively poor control of migration of the liquid embolic agent into the parent artery. We performed an 7 aneurysm embolisations study using a liquid embolic agent and different protective devices and embolic materials to evaluate the safety and technical feasibility of this endovascular technique.

Endovascular treatment of cerebral aneurysms with detachable coils has now been proven to be a superior alternative to open microsurgery in terms of disability-free survival 1 year following treatment. Despite this, recurrence due to recanalization of these aneurysms

in 10-20% of patients after coiling is still the main drawback of the endovascular technique. In the last 5 years, access devices and endovascular tools based on new concepts, materials and endovascular reconstruction techniques that go beyond simply coiling have been described for cerebral aneurysm treatment, especially for more complicated broad-necked, fusiform and large/giant aneurysms.

Purpose

The aim of this study was to introduce the feasibility and efficacy of the treatment of wide-necked and giant intracranial aneurysms with the use of mixture of different embolic materials and supporting devices.

Materials and Methods

Seven patients harboring 8 intracranial aneurysms, most of which being giant or wide-necked, were successfully treated with this technique. 4 of the patients were treated with the combination of coils and n-BCA – one of the with the use of intracranial stent, 2 with the use of coils and ONYX and one harbouring giant right ICA aneurysms with injection of high-concentrated glue. All procedures were carried out with external manual compression of an ICA used as manner to stop and control the blood flow. The liquid embolic materials were injected through the same microcatheter which was used to deploy the coils.

Results

In four of our patients small neck remnant was seen in the control angiography, in 3 aneurysms the dimensions as well as very wide neck caused the incomplete occlusion of aneurysm sac. We did not note the instant major complications.

The mass effect remained unchanged in 4 patients in 3 in time till angiographic control in got slighter.

In 3 months after the treatment in one of the patients the total occlusion of an ICA took place which caused brain infarct and hemiplegia. 6 of the patients were controlled angiographically after 6-9 month.

In 5 the occlusion of the aneurysm sac was stable. No recanalisation was found.

Conclusion

The embolisation with mixture of different is a feasible and effective method in the treatment of high-risk giant or wide-necked intracranial aneurysms which are difficult to treat with other endovascular or microsurgical techniques. Although we must remember that presented ideas and techniques have the preliminary character and can not be advocated widely. They require further research and discussion.

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