Intracranial Aneurysm rebleeding after coil embolization

Acute aneurysm rerupture after coil embolization is defined as rerupture within three days after treatment; its prognosis is worse than that of rebleeding at other time periods. However, to date, little is known about complications during the acute phase.

In the study of Chang et al. ¹⁾, the incidence of rebleeding after coiling for ruptured intracranial aneurysms was 2.1% of 7 patients among 330 patients. This incidence rate was similar to those reported in previous studies.

Tsurumi et al confirmed that delayed aneurysm rupture after coiling occurs in the majority of cases when there is an aneurysm remnant, but is also possible in cases of neck remnant. The risk is also higher in patients with large and giant aneurysms².

Li et al. used the PubMed database to perform a review of acute rerupture after coil embolization of ruptured intracranial saccular aneurysms and increase the understanding. After reviewing the complications, they found that the cause of acute rerupture is unclear, but the following risk factors are involved: incomplete occlusion of the initial aneurysm, the presence of a hematoma adjacent to a ruptured aneurysm, an aneurysmal outpouching, poor Hunt-Hess grade at the time of treatment, and the location of the aneurysm in an anterior communicating artery. In addition, intraoperative rupture is a non-negligible cause. Acute rerupture after coil embolization mainly occurs within the first 24 hours after the procedure. Brain computed tomography is the gold standard for diagnosing acute rebleeding of a coiled aneurysm. For acute rerupture after coil embolization, prevention is critical, and complete occlusion of the aneurysm in the first session is the best protection against acute rebleeding. In addition, a restricted postembolization anticoagulation strategy is recommended for patients with high-risk aneurysms. For patients with an adjacent hematoma, surgical clipping is recommended. Most patients present no changes immediately after acute rebleeding because of their poor condition. However, surgical or endovascular treatments can be attempted if the patient is in an acceptable condition. Even so, the outcomes are typically unsatisfactory ³⁾.

Case series

2017

White et al. retrospectively analyzed a consecutive series of patients presenting with aneurysmal subarachnoid hemorrhage who underwent endovascular management to determine factors associated with rebleeding. Rebleeding occurred in 7/183 (3.8%) patients, 6 of which had an adjacent hematoma on initial neuroimaging. Aneurysms were located on the ACoA (n=5), PCoA (n=1), and MCA (n=1). Sizes ranged from 3.5 to 13.0mm (mean 8.0), with neck sizes ranging from 1.8 to 4.6mm (mean 3.2). Time-to-rerupture ranged from hours to years, with 3/7 cases rebleeding within 30days and 4/7 cases rebleeding later than 30days. Initial incomplete angiographic occlusion occurred in 2/3 cases of early rebleeding. The presence of adjacent intracerebral hematoma (ϕ =0.354, p<0.005), increasing Fisher Grade (t(9.4)=7.72, p<0.005), and aneurysmal outpouching (ϕ =0.265, p<0.005)

were found to be the only factors associated with rerupture status. Recurrent hemorrhage following endovascular management of ruptured intracranial aneurysms is an uncommon but important source of morbidity, particularly in the early post-embolization period. The presence of high-risk features, such as an adjacent intracerebral hematoma or aneurysm outpouching, warrant early and frequent angiographic follow up to document stability and mitigate rupture risk ⁴⁾.

1)

Chang SH, Shin HS, Lee SH, Koh HC, Koh JS. Rebleeding of Ruptured Intracranial Aneurysms in the Immediate Postoperative Period after Coil Embolization. J Cerebrovasc Endovasc Neurosurg. 2015 Sep;17(3):209-16. doi: 10.7461/jcen.2015.17.3.209. Epub 2015 Sep 30. PubMed PMID: 26526272; PubMed Central PMCID: PMC4626344.

2)

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Li K, Guo Y, Zhao Y, Xu B, Xu K, Yu J. Acute rerupture after coil embolization of ruptured intracranial saccular aneurysms: A literature review. Interv Neuroradiol. 2017 Jan 1:1591019917747245. doi: 10.1177/1591019917747245. [Epub ahead of print] PubMed PMID: 29231793.

White AC, Roark CD, Case DE, Kumpe DA, Seinfeld J. Factors associated with rerupture of intracranial aneurysms after endovascular treatment: A retrospective review of 11years experience at a single institution and review of the literature. J Clin Neurosci. 2017 Oct;44:53-62. doi: 10.1016/j.jocn.2017.06.033. Epub 2017 Jul 14. Review. PubMed PMID: 28716568.

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