

Intraoperative Cerebral Angiography in Intracranial Aneurysm Surgery Reduced Occurrence of Postoperative Cerebral Ischemia and Rebleeding: a Retrospective Study of 155 Patients

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Introduction

Intraoperative cerebral angiography (IOA) is now commonly utilized in intracranial aneurysm surgery to confirm satisfactory aneurysm occlusion and normal vasculature preservation. Cerebral ischemia is a known risk from branch compromise at the treated aneurysm neck. There is sparse data on the safety and efficacy of intraoperative angiography in aneurysm surgery compared to microsurgical treatment alone.

Methods

A prospective neurosurgical database in a single institution was retrospectively reviewed over 5 years (8/2007-9/2012) to identify consecutive patients who had undergone craniotomy for treatment of intracranial aneurysms. Both ruptured and unruptured aneurysms were included. Patients were separated into two groups: those who had undergone microsurgical treatment with IOA and those who underwent microsurgery alone. The incidences of imaging confirmed (CT or MR) perioperative cerebral ischemia and 30-day aneurysm rebleeding were collected for both groups. Two-tailed Fisher's exact test was utilized for statistical analysis.

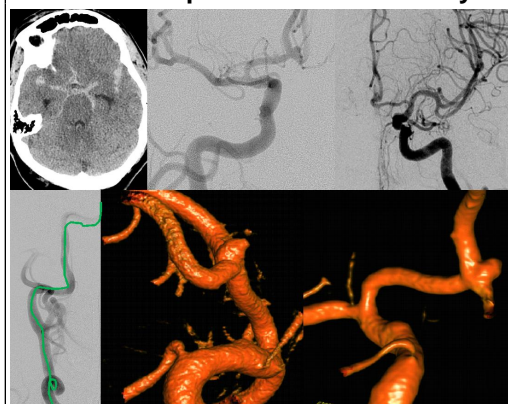
Results

A total of 155 patients were included in the study. 109 of the patients had undergone microsurgery with IOA while 46 patients underwent microsurgery alone. The decision of IOA use was based on individual neurosurgeon preference. 5 patients in the IOA group and 6 patients in the group without IOA had imaging confirmed perioperative cerebral ischemic events. One patient without IOA suffered rebleeding from the clipped aneurysm three weeks postoperatively, while none in the IOA group rebled. No direct adverse event was noted for IOA procedures. Hence, the perioperative cerebrovascular complication rate was 4.6% for the IOA group and 15.2% for the non-IOA group, a statistically significant difference ($p = 0.04$).

Conclusions

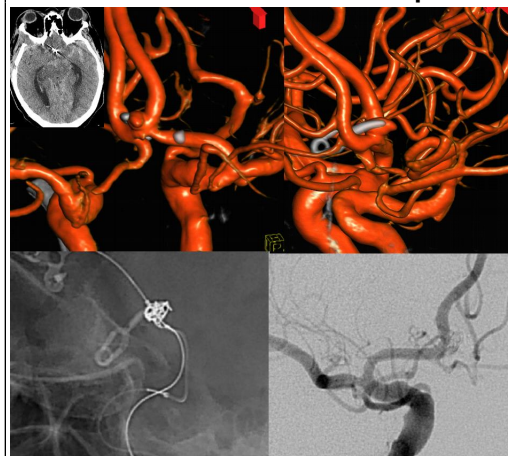
Patients who underwent intraoperative cerebral angiography during intracranial aneurysm surgery experienced less perioperative cerebral ischemia and aneurysmal rebleeding when compared to those who underwent microsurgery alone in this retrospective study. Intraoperative cerebral angiography is a safe and effective adjunct to microsurgery in the treatment of both ruptured and unruptured intracranial aneurysms in the appropriate settings.

SAH from Ruptured Acomm Aneurysm



Aneurysm clipped without IOA

Rebleed 3 Weeks Post-Op



Partially clipped aneurysm found and treated with coil embolization.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of intraoperative cerebral angiography in aneurysm surgery; 2) Discuss the potentials of IOA in reducing perioperative complications of aneurysm surgery; 3) Identify an effective strategy in IOA utilization.

References

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