## Intraventricular hemorrhage after ruptured intracranial aneurysm

Intraventricular hemorrhage due to ruptured intracranial aneurysms often have poor outcomes. Treatment challenges include co-morbidities, intracranial hypertension due to IVH, and the risk of rebleeding.

Two cases of severe IVH accompanied by acute hydrocephalus due to ruptured aneurysm were treated with coil embolization followed by endoscopic hematoma evacuation as a single treatment session in a Hybrid operating room (Hybrid OR) equipped with a multipurpose angio biplanesystem. The first case was an 84-year-old female with a ruptured basilar top aneurysm, who presented with Hunt and Hess (H&H) Grade 5 subarachnoid hemorrhage (SAH) with packed IVH. The second case was a 43-year-old male with a ruptured anterior communicating artery aneurysm who presented with H&H Grade 5 SAH with packed IVH. In both cases, endovascular coil embolization was performed first to prevent intra-operative bleeding. The coiled aneurysms suddenly appeared on the screen of the endoscope during the hematoma removal which could have led to massive re-bleeding if not treated previously. Neither patient needed a re-insertion of the ventricular drainage or developed chronic hydrocephalus during the hospitalization. The Hybrid OR enabled the two treatment approaches to be performed without the need to transfer the patient, thereby minimizing the transition time between the modalities. Intra-operative cone-beam computed tomography contributed to the evaluation of residual clots.

A Hybrid OR may contribute to a combined neuro-endoscopic and endovascular treatment for ruptured cerebral aneurysms with severe intra-ventricular hemorrhage<sup>1)</sup>.

1)

Mori R, Yuki I, Kajiwara I, Nonaka Y, Ishibashi T, Murayama Y. Hybrid Operating Room for Combined Neuro-Endovascular and Endoscopic Treatment of Ruptured Cerebral Aneurysms with Intra-ventricular Hemorrhage. World Neurosurg. 2016 Jan 20. pii: S1878-8750(16)00089-9. doi: 10.1016/j.wneu.2016.01.010. [Epub ahead of print] PubMed PMID: 26802870.

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