Aneurysmal Acute Subdural Hemorrhage: Evaluation and Treatment

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Introduction

Acute subdural hematoma (SDH) is an uncommon presentation of aneurysmal hemorrhage that has been identified as a poor prognostic sign [1]. Current series are small, have short follow-up and/or were collected over a long period during which treatment has evolved [2]. We present a large modern series of aneurysmal SDH with long-term follow-up, and evaluate prognostic factors for good outcome.

Methods

A prospectively maintained database was queried for all aneurysmal SDH from 2000-present. Of 1564 patients, thirty patients met criteria and were analyzed. Inclusion criteria included the presence of at least one cerebral aneurysm and nontraumatic convexity acute SDH. Exclusion criteria included age less than 18 years, isolated falcine or tentorial SDH, pseudoaneurysm, or lack of available initial imaging. Baseline demographics, clinical and radiographic presentation, management, outcome at discharge and at 6-12 months were collected. Statistical analysis was performed with unpaired t-test or Fisher's exact test when appropriate.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Recognize the uncommon presentation of acute SDH as a manifestation of aneurysmal hemorrhage, 2) Describe prognostic factors for outcome in aneurysmal SDH.

References

1. Biesbroek, J.M., et al., Prognosis of acute subdural haematoma from intracranial aneurysm rupture. J Neurol Neurosurg Psychiatry, 2013. 84(3): p. 254-7.

2. Schuss, P., et al., Aneurysm-related subarachnoid hemorrhage and acute subdural hematoma: single-center series and systematic review. J Neurosurg, 2013

Results

Overall incidence of aneurysmal SDH was 1.9%. Average age and Hunt-Hess (HH) scores upon presentation were 61 and 3.8, respectively. Average initial SDH thickness and midline shift were 6.7mm and 5.9mm, respectively. Twenty-one SDHs were on the right, 26 presented with subarachnoid hemorrhage, while 19 harbored intraparenchymal hematomas. Aneurysm treatment involved open clipping in 18, endosaccular coiling in 8, both in one patient, and three patients were not treated due to their poor presenting neurological status. Twenty-four underwent craniotomy with hematoma evacuation; four of these were converted to a decompressive craniectomy. Three patients underwent coil embolization of their aneurysms without a need for hematoma evacuation. The average interval from hemorrhage to treatment was 0.78 days.

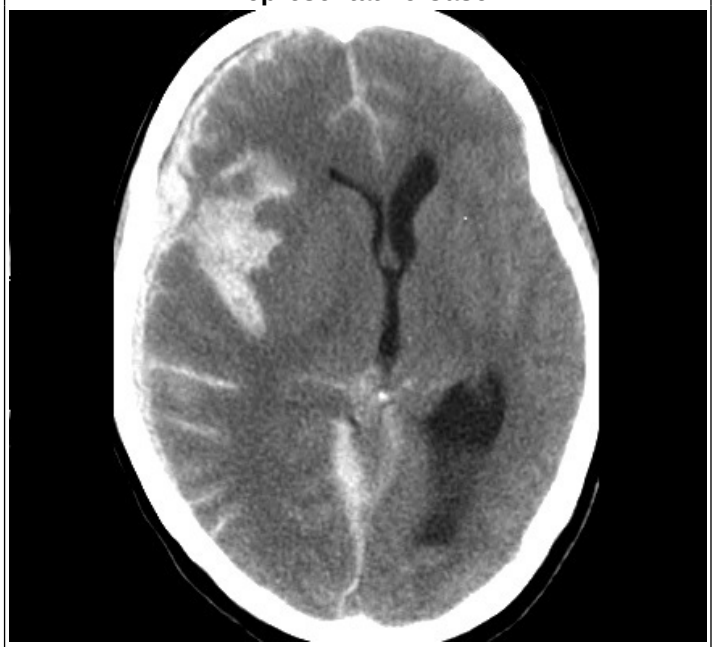
Good Glascow Outcome Scale, (GOS 4-5) at discharge was present in 20% of patients and increased to 40% at 6-12 months postoperatively. Good clinical presentation (HH 1-2) was associated with a good final outcome in 75% while poor clinical presentation (HH 4-5) correlated with a good outcome in 35%.

Good outcome correlated with younger age ($p=0.04$), smaller aneurysm size ($p=0.04$) and lower HH at intervention ($p=0.04$). This favorable outcome did not correlate with gender, race, presence of subarachnoid or intraparenchymal hemorrhage, size or laterality of hemorrhage, midline shift or aneurysm treatment modality and more importantly HH grade at admission ($p>0.15$). There was no difference between patients with good and poor outcomes in terms of time to treatment or hematoma evacuation and a need for decompressive craniectomy.

Conclusions

Patients with aneurysmal SDH present in poor clinical grade compared to historical controls without hematomas. However, poor-grade presentation resulted in a good clinical outcome in 35% of cases, and overall good outcome in 40%. This suggests that SDH itself may not worsen outcomes and may in fact mask a less severely injured patient than one with a similar HH grade suffering from non-SDH aneurysmal hemorrhage. Clinical grade at the time of intervention, aneurysm size and age correlated with outcome.

Representative Case



Note convexity SDH and midline shift. This patient presented in poor clinical grade but after aneurysm treatment and subdural hematoma evacuation, at long-tem follow-up had a good neurologic outcome.