Editorial

Early subarachnoid hemorrhage

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Tsam and colleagues explore the implications of contrast extravasation seen on hyperacute CT angiograms performed for the workup of subarachnoid hemorrhage (SAH). Based on their experience with 9 cases in which patients underwent CT angiography (CTA) at their institution within 2 hours of ictus, and another 12 cases culled from the literature in which most of the patients (10 of 12) underwent CTA, they conclude: 1) that outcomes in those with contrast extravasation tend to be poor, 2) that only patients who are classified as good grade prior to their CTA-documented rebleeding are likely salvageable, and 3) that salvage in this initially good-grade population requires immediate microsurgical repair together with aggressive cranial decompression. With regard to the overall poor outcomes reported (76% of patients dead or in a vegetative state), these seem expected given that 82% of those patients with documentable findings from neurological examinations performed after the rebleeding were classified as WFNS Grade V, and 95% were classified as Grade IV or V. While the conclusions regarding salvageability seem equally plausible, the data are less convincing. For instance, although all 11 patients presenting in poor condition prior to the CTA-documented rebleeding died or were left vegetative, none of these patients actually underwent the immediate aggressive decompressive surgery the authors generally offered to those initially presenting in better condition. In addition, 5 of the 11 were over the age of 70 years and 3 were over 80. Thus while I share the authors’ pessimism, and a rebleeding episode of any type in a poor-grade patient certainly carries an extremely poor prognosis, I would like to see a sizable cohort of young patients whose cases were managed in a maximally aggressive manner before I’d be comfortable concluding futility. One also wonders whether the initially good-grade patients who rebled during CTA and became WFNS Grade V were salvaged because of the timely decompressive surgery or because they were actually not truly Grade V but rather “postictal.” Determining which is the case will require more patients, and even then it may be difficult. But for the time being, 3 good outcomes in 3 Grade V patients suggests that something else might be going on, especially given the less than miraculous outcomes seen with craniectomy in other poor-grade SAH populations.

Two additional issues that bear some mention include the timing of the decompressive surgery and the timing of CTA. The authors suggest that it is the acuteness of the decompression that matters, yet their data suggest that even delayed decompression, as performed in Case 3, may be sufficient to achieve good outcome. This raises the possibility that endovascular repair followed by decompression may be reasonable in patients whose intracranial pressure can be acutely controlled. Whether this turns out to be the case or not will also require further study. Finally, the incidence of rebleeding during CTA in this study is very high (occurring in 9 [15%] of 62 patients). This is likely due to the fact that CTA was performed during a time frame when the incidence of rebleeding is highest, but a rate of 15% makes one wonder what percentage of all the rebleeding episodes occurred during CTA. If the percentage is alarmingly high, it is all the more interesting that less than 10% of the cases of intra-CTA rebleeding ever reported occurred beyond the hyperacute period (first 3 hours). While CTA tends to be one of those studies performed early in the course of care, one cannot help but wonder whether hyperacute CTA, like hyperacute angiography, might increase the likelihood of bleeding from a particularly unstable aneurysm. Although it is hard to imagine why, further studies are needed to examine whether CTA, particularly as performed in this study, is capable of causing alterations in blood pressure or transmural pressure. If so, there might be pharmacological maneuvers that could block this untoward physiological response and improve outcomes in centers where hyperacute scanning is common.

Disclosure

The author reports no conflict of interest.

References

Response

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We appreciated Dr. Connolly’s understanding why we did not treat some older poor-grade patients aggressively. Of course, age is an important factor and should be taken into consideration, and patient selection bias is inevitable in this retrospective study. In our clinical practice, we have to consider not only medical factors but also the concerns of the patients’ families. Generally, poor-grade aneurysmal SAH has a poor prognosis, especially in older patients. In such circumstances, some neurosurgeons and families may choose conservative treatment first and then opt for surgery if there is any improvement. If a hyperacute rebleeding with deterioration is identified during the initial CTA evaluation, should we treat the patient aggressively with aneurysm obliteration and decompression, or treat the patient conservatively to see if perhaps the deterioration is only postictal? We reported our experience in identifying a specific subgroup of poor-grade patients who are salvageable in this clinical condition. In another study, we used perfusion CT to stratify the risk factors in poor-grade aneurysmal SAH patients. Early prolonged mean transit time at bilateral thalami and old age were found to be associated with poor outcome. We also found that early obliteration benefits a significant portion of poor-grade aneurysmal SAH patients.

Another concern is whether a patient’s condition truly represents Grade V, rather than a postictal state. In the current medical situation, the relationship between doctors and patients and their families is not solid at emergency consultation. If a patient’s condition deteriorates at the hospital and the family is not understanding, doctors might face a lawsuit if they have not treated the patient aggressively. That is the reason why, after discussion with the patient’s family, we typically undertake surgery soon after his or her condition deteriorates during CTA. There are a lot of causes of deterioration of consciousness after aneurysm rupture, including seizure, hydrocephalus, and intracranial hypertension. After initial resuscitation, unless surgical intervention is contraindicated, differentiating a true Grade V from postictus might delay the treatment. The rebleeding rate in this study is a little higher than in other studies, but our study also reported the shortest ictus-to-CTA time, and the rebleeding rate generally decreases over time. Another factor that affects the report of less rebleeding is whether radiologists search for contrast leakage in every case or not. In addition, the reported rate of aneurysm rebleeding during conventional angiography within 3 hours of the ictus is higher—23.9%. This higher incidence in comparison to that during CTA may be explained by the duration of the study as well as the induction of rebleeding by intraarterial contrast injection. However, whether CTA brings a higher rebleeding rate or not will require further study.

References


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