There Is Still Hope for Surgery for Spontaneous Supratentorial Intracerebral Hemorrhage

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See related article, p XXX–XXX.

The epidemiological perspective on spontaneous intracerebral hemorrhage (ICH) is bleak. ICH affects approximately 1.5 million adults in the world each year, the incidence of ICH has not consistently changed over several decades, approximately 40% of patients still die within 1 month of ICH, and no specific treatment improves outcome.1,2 Unless effective treatments are found, the burden of ICH is certain to worsen given the recent rise in the incidence of stroke in low- to middle-income countries3 as well as the World Health Organization’s estimate that the global population aged ≥60 years will more than triple from 600 million to 2 billion in 2050 (with most of this increase occurring in less developed countries).

However, hope is offered by Gregson et al’s4 individual patient data meta-analysis of randomized controlled trials of surgery for supratentorial ICH. This meta-analysis extends the work of the 2009 systematic review in the Cochrane Database5 by using data on 2186 individual patients in 8 randomized controlled trials to analyze the effects of surgery according to characteristics of the patient or their ICH. The advantage of individual patient data meta-analysis is that it increases the power to detect differential treatment effects across individuals in randomized trials.6 The most consistent and statistically significant findings were that surgery seemed effective in patients with a higher conscious level (especially Glasgow Coma Scale score 9–12) and in patients who were randomized to surgery within 8 hours of ICH symptom onset.4

The hope offered by these findings should be tempered by an appreciation of the strengths and weaknesses of the analyses. Gregson et al laudably prespecified their subgroup definitions and analyses, and their definitions maximized the inclusion of trials that had categorized continuous variables or that could only provide aggregate data. The risk of bias in the included trials was judged on the strength of their allocation concealment alone, which had been found to be adequate.5 Gregson et al maximized the power of their analyses by identifying 2 eligible trials not included in the Cochrane Database systematic review.5 However, they were able to include just 1 of these trials,7 which investigated minimally invasive clot aspiration and lysis with urokinase for basal ganglionic hematomas and reported a much greater benefit from surgery for ICH in this location than in other trials. The findings of this trial will have contributed moderate statistical weight to several of the subgroup analyses (in particular, the finding that surgery seemed effective in patients who were randomized to surgery within 8 hours of ICH symptom onset).4,7 Several completed trials were omitted from the analyses because 1 author was “unable to take part,” “data were not retrievable” for 2 published trials, data supplied by 1 trial were of “insufficient detail,” and 1 author of a study published in 2006 was “unable to locate” some data.

Three more factors were beyond Gregson et al’s control. First, the interventions and comparators used in the trials varied: “surgery” might have involved open craniotomy, endoscopic surgery, or stereotactic aspiration with thrombolytic instillation and repeated aspiration, whereas “medical management” may have included standard stroke unit care, intensive care management, intracranial pressure monitoring (and treatment), and ventricular drainage. Second, the included trials did not measure the same outcomes at the same time points, so Gregson et al translated these measures into a single dichotomous “favorable” versus “unfavorable” outcome. Finally, the effects of surgery for patients with a higher conscious level as well as for patients who were randomized to surgery within 8 hours of ICH symptom onset might be simply explained if patients’ conscious levels tended to be higher soon after symptom onset.

So, what do these findings mean for practicing neurosurgeons, neurologists, and stroke physicians? Although the findings of an apparent benefit of surgery for patients with higher conscious levels treated soon after symptom onset may not conclusively change current guidelines,8,9 they provide food for thought. Surgery may not save the deteriorating patient,8 but rather it may prevent deterioration. Despite the findings of the Cochrane Database systematic review,5 the lack of overall benefit from early surgery compared with initial conservative management in the Surgical Trial in IntraCerebral Hemorrhage (STICH)10 alone seems to have led to a decline in neurosurgical admission and treatment practices for ICH in some parts of the world11 but not demonstrably in others.12 Any carte blanche refusal to evacuate ICH, because surgery had not been shown to be superior to best medical management, is now questionable and clinicians need to re-evaluate their practice to account for the subgroups that may benefit from surgery.

The opinions in this editorial are not necessarily those of the editors or of the American Heart Association.

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If the subgroups of patients who may benefit from surgery are to be recruited into ongoing trials such as STICH II (http://research.ncl.ac.uk/stich/) or new trials targeted at the subgroups identified by this individual patient data meta-analysis, then neurosurgeons must remain involved with the care of patients with ICH. Identifying appropriate patients will also require clinicians in the emergency department to be aware of ongoing trials and radiologists to measure the volume of ICH in the same way that they have been crucial to supporting the study and subsequent delivery of thrombolysis for acute ischemic stroke. One major neurosurgical challenge lies in being able to perform surgery within 8 hours of ICH onset; for some units, this may require additional operating room capacity, additional ancillary staff, and a closer working relationship with their corresponding stroke units to facilitate early surgery and expedite appropriate discharge. In future trials, careful consideration will also need to be given to standardizing the type of surgical intervention and ensuring that postsurgical monitoring and care do not introduce performance bias. Finally, Gregson et al’s findings are a reminder that future trials would do well to heed recommendations for the conduct of surgical research, including agreed definitions of key outcomes\textsuperscript{13} and careful archiving of trial data sets.

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References

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