Evacuation of Intracerebral Hematoma Is Likely to Be Beneficial—Against

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The 4 recognized surgical procedures to evacuate an intracerebral hematoma (ICH) are simple aspiration, craniotomy with open surgery, endoscopic evacuation, and stereotactic aspiration. Their use in clinical practice is inconsistent. In some countries (eg, the Netherlands) they are rarely performed; in others (eg, the United States) they are undertaken in about 20% of patients with ICH; and in others (eg, some centers in Germany and Japan) they are offered to 50% or more of patients. Such wide variation in practice reflects uncertainty about the effectiveness and risks of surgery, due to a lack of appropriate evidence. The required evidence is evaluation by large randomized controlled trials (RCTs), because RCTs minimize systematic biases and random errors that can otherwise falsely exaggerate or completely mask any real modest overall treatment effect of surgery (favorable and unfavorable).

What Is the Evidence for Surgical Evacuation of Supratentorial Hematoma?

Simple Aspiration
Simple aspiration was abandoned before it was properly evaluated because only small amounts of clot could be removed, and it could precipitate “blind” re-bleeding.

Craniotomy With Open Surgery
A systematic review of 5 RCTs in a total of 305 patients indicates that craniotomy and open surgery combined with best medical therapy is associated with a nonsignificant increase in odds of death or dependency by 1.46 (95% CI: 0.87 to 2.45) compared with best medical therapy alone (surgery, n=114/147 [77.6%]; control, n=111/158 [70.2%]). After excluding the largest trial,3 because it was undertaken before CT brain scan, the 4 trials showed a modest nonsignificant decrease in death or dependency (odds ratio [OR] 0.90, 95% CI: 0.40 to 2.03) (surgery, 43/58 [74.1%]; control, 51/67 [76.1%]).

Endoscopic Evacuation
One RCT indicates that endoscopic evacuation by stereotactic methods is associated with a statistically nonsignificant, but substantial, 54% (95% CI: −4% to 80%) reduction in odds of death or dependency (surgery, 28/50 [56%]; control, 37/50 [74%]). The absolute risk reduction was 18% (95% CI, −3% to 36%).

Stereotactic Aspiration
Despite reports of stereotactic aspiration without endoscopy, usually combined with installation of fibrinolytic agents, in more than 500 patients with supratentorial intraparenchymal or intraventricular hemorrhage, this technique has not been evaluated by RCTs (but needs to be).

What Is the Evidence for Surgical Evacuation of Infratentorial Hematoma?

Cerebellar Hematomas
Because observational studies suggest that surgical evacuation of a cerebellar hematoma by suboccipital craniotomy has more than a modest favorable effect in saving the lives of patients with clinical features of progressive brain stem compression, and with surprisingly few adverse neurological sequelae, a RCT is unlikely to be ethically approved and undertaken. The relative merits of conventional suboccipital craniotomy and stereotactic aspiration, with or without installation of fibrinolytic drugs, in this group of patients is uncertain.

Not all cerebellar hematomas require evacuation. The selection criteria for surgery ignite controversy, but probably include impaired consciousness with preserved brain stem reflexes, and perhaps large hematomas (>3 to 4 cm in diameter) and vermis hematomas distorting the quadrigeminal cistern, even in alert patients, because delayed decline in consciousness and death can be extremely rapid.

Pontine Hematoma
Despite a case-fatality rate of about 60%, most patients with pontine hematoma are managed conservatively. Apparently successful stereotactic aspiration has been reported in uncontrolled case series, but the effect on the prognosis remains uncertain.

Conclusion
It is sobering that surgical evacuation of intracerebral hematoma has been undertaken for nearly half a century on the basis of plausibility and general acceptance by the surgical community, without formal evaluation by the same regulatory standards that are applied to medical therapies. Although “surgical studies with controls have tended to lack enthusiasm, and surgical studies with enthusiasm have tended to lack controls” (David Sackett, MD, MSc, 1985), such double standards are no longer acceptable. If the standards for medical therapies are applied to surgical procedures for evacuation of intracerebral hematoma, surgical procedures...
would be not approved or funded. This does not mean they are not effective and safe; it means they have not been shown to be effective and safe, and it is our responsibility to do so before they are widely practiced.

What can be deduced from the available evidence is that surgery, and particularly endoscopic evacuation, may be effective and relatively safe, but it may also be ineffective and harmful, and the overall magnitude of the effectiveness and hazards of surgery is substantially uncertain, let alone for a particular technique, and for patients with different prognostic factors, and for hematomas in different sites of the brain (eg, lobar, deep, infratentorial).

However, the data from RCTs are about to treble with the forthcoming results of the International Surgical Trial in Intracerebral Hemorrhage (ISTICH), which randomized 1033 patients within 72 hours of supratentorial hemorrhage to immediate surgery versus no surgery, and which closed recruitment on February 25, 2003. The trial should refine the precision of the above estimates of effectiveness, generate more hypotheses, and hopefully generate more RCTs of surgery for intracerebral hematoma with improved patient outcome.

References


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