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Media release

Severe deep brain bleeds can be treated, new stroke study shows

A landmark study led by the Inselspital, Bern University Hospital, and the University of Bern has demonstrated that a surgical procedure to reduce pressure in the brain may save lives and reduce handicap in people with severe deep-bleeding strokes. This is the first study showing a likely benefit for these severely affected people, who so far have had no other treatment option.

Stroke causes 6.5 million deaths per year and is a major global health burden. The most common cause of stroke is reduced blood flow, also called ischaemic brain infarct. However, around 20 percent of all strokes are caused by bleeding into the brain, called intracerebral haemorrhage. Although less common than ischaemic brain infarct, brain haemorrhage is more likely to have serious consequences: It accounts for nearly half of all stroke deaths.

No therapy has been available for severe brain bleeds

Bleeding into the brain is usually the result of a ruptured blood vessel. The blood destroys brain cells, which causes the brain tissue to swell and, along with the bleeding, increases the pressure in the brain—often with serious health consequences.

Treatment is particularly difficult when the bleeding occurs in the brain's deep structure. To date, no pharmacological or surgical treatment has been able to reduce morbidity or mortality in such cases. The recently published international SWITCH study led by the Inselspital, Bern University Hospital, and the University of Bern now gives hope by showing that a surgical procedure called decompressive craniectomy may save lives and reduce handicap.

The first study of its kind worldwide

Decompressive craniectomy means the removal of a part of the skull to create a space that compensates for increased intracranial pressure. This surgical procedure has been shown to improve long-term outcomes in people with an ischaemic brain infarct. However, SWITCH is the first study to investigate this for people with a brain haemorrhage. The study was supported mainly by the Swiss National Science Foundation and the Swiss Heart Foundation.

The study enrolled 201 adults with a severe deep brain haemorrhage in nine European countries. Because funding was discontinued after eight years, the study did not reach its target of 300 participants. The participants were randomly assigned to two groups: decompressive craniectomy plus best medical treatment or best medical treatment alone. The primary outcome assessed the proportion of participants who were bedridden or deceased six months after the stroke.

Improved patient outcome seems possible

The study results, published in the leading medical journal *The Lancet*, show a substantial difference in outcomes between the two groups: 44 percent of participants receiving the new, combined treatment were bedridden or deceased after six months compared to 58 percent in the control group without craniectomy. Notably, craniectomy did not significantly increase the likelihood of adverse events.

Because the number of study participants was smaller than originally planned, the statistical power of the study was limited. Nevertheless, it provides evidence that decompressive craniectomy may be beneficial in cases of severe deep brain haemorrhage. “SWITCH is the first study worldwide showing that a substantial reduction may be possible in mortality and handicap of people with a severe deep intracerebral haemorrhage. Our results are even more important given that there is currently no other treatment option for these people”, says Professor Urs Fischer, who co-led the study with Professor Jürgen Beck.

The results of the SWITCH study do not allow conclusions to be drawn about other types of intracerebral haemorrhage, such as superficial haemorrhages and smaller haemorrhages. Moreover, participants in both study groups still exhibited high rates of severe disability and death. This underscores the urgent need for further research to optimize treatment strategies for intracerebral haemorrhage. Next, the SWITCH investigators plan to examine whether various subgroups within their study population face different risks and receive different benefits from decompressive craniectomy.

Links

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Publication

Beck J, et al. Decompressive craniectomy plus best medical treatment versus best medical treatment alone for spontaneous severe deep supratentorial intracerebral haemorrhage: a randomised controlled clinical trial. Lancet 2024; DOI: 10.1016/S0140-6736(24)00702-5

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The **Stroke Center Bern** at the Department of Neurology of the Inselspital, Bern University Hospital, is a pioneer center for stroke management and the largest such center in Switzerland. It is a world-renowned nucleus of excellence for high-quality patient-oriented clinical research spearheading major breakthroughs in **stroke care** (mechanical thrombectomy, management of haemorrhagic stroke, dissections, sleep and stroke, and cerebral venous thrombosis) and **brain health**. In cooperation with the Clinical Trial Unit at the Department of Clinical Research (DCR), coordinated by the Neuro-CTU (NCTU) and supported by competitive funding, the Stroke Center Bern has successfully conducted large, randomized, controlled, international multicenter trials, published in major medical journals (*Lancet*, *NEJM*, *JAMA*, *Circulation*). In addition, the Stroke Center Bern hosts the **European Stroke Master Programme,** an international programme training the next generation of stroke researchers, and since 2013 the annual **Stroke Winter School**.

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