The Case:
A 70-year-old right-handed woman with a massive right MCA infarction and 3 mm midline shift is seen within 17 hours of onset.

The Questions:
(1) Should hemicraniectomy be considered in this patient?
(2) What is the best time for surgery? Operate emergently or wait for a more significant, midline shift?
(3) Would hemicraniectomy increase the likelihood of functional recovery in this patient?

The Controversy:
EARLY DECOMPRESSIVE HEMICRANIECTOMY IN OLDER PATIENTS WITH NON-DOMINANT HEMISPHERIC INFARCTION IMPROVES OUTCOME.

Early Decompressive Hemicraniectomy in Older Patients With Nondominant Hemispheric Infarction Improves Outcome

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To answer the questions regarding the efficacy of hemicraniectomy in older patients with malignant middle cerebral artery infarctions, several facts and open questions must be considered. First, the natural course of complete middle cerebral artery infarctions is associated with early death in 70% to 80% of cases. This “malignant” and deadly course can also be seen in older patients. Second, in case of survival, recovery with a complete functional independent outcome is almost impossible.1 Third, there is no proven standard medical or conservative critical care management. Standard care is largely ineffective and probably not better than palliative care.1,2 Osmotherapy, hyperventilation, buffers, barbiturates, and hypothermia are unproven, ineffective, or even detrimental.2 Fourth, the efficacy of hemicraniectomy only has been shown in younger patients up to age 60 years.1 Currently, there are no data from adequate clinical studies that can be used to support the decision for or against hemicraniectomy in older patients. Cohort reports on the prognosis after malignant middle cerebral artery infarction suggest the effect of hemicraniectomy on survival is less with advanced age, but no solid outcome data are available so far. The largest of these studies3 includes 188 patients, of whom 74 were older than 60 years (independent outcome in 25% of younger vs 11% of older patients; complete dependency or death in 29% vs 38%). This study does not give comparative baseline data between younger and older patients, although several are identified as prognostic factors, such as time to treatment. The most frequently cited study4 includes 14 patients and compares 3 patients older than 60 years who all survived (Barthel Index scores 80, 25, and 15) to 11 patients younger than 60 years (3 died, 8 survived with Barthel Index scores 40–100). These 2 and nearly all other available studies are retrospective and unfortunately have selection bias (ie, older patients were usually treated later and less aggressively, they more often had concomitant diseases and additional infarctions of the anterior cerebral artery and/or posterior cerebral artery) and use arbitrary cut-offs (usually of 50, 55, or 60 years). These studies lacked a control group of conservatively treated patients, rendering them not useful for individual decision-making. The most frequently cited comparative study is a small and nonrandomized report5 retrospectively comparing hemicraniectomy to conservative treatment in 7 surgical patients older than 60 years (3 survived; modified Rankin scale scores of 4 [n=2] and 5 [n=1]), 5 surgical patients 60 years or younger (all survived, modified Rankin scale scores of 4 [n=3] and 5 [n=2]), and 10 conservatively treated patients older than 60 years (2 survived, modified Rankin scale scores of 4 [n=2]). Taken together, these studies show that hemicraniectomy probably increases survival rates in older patients with malignant
middle cerebral artery infarctions compared to conservative treatment and that independent outcome is possible. Better results may be seen if hemicraniectomy is performed early and is combined with adequate intensive care unit treatment.

However, the most important question is whether the remaining disability in older patients surviving malignant middle cerebral artery infarctions is acceptable. Post hoc surveys report 80% to 100% retrospective agreement to hemicraniectomy, both by survivors and relatives. This agreement seems to be independent of age, side of the lesion, and disability. Acceptance of disability does not seem to be different in older patients.6

What are our options? When there is no adequate evidence we have to create it. DESTINY II, a randomized trial including patients 61 years and older, is ongoing and has already recruited 45 patients.7 Until we have the data, what should be performed in centers that do not participate in this regional trial? Perform hemicraniectomy outside of a trial, extrapolate from the pooled analysis in the young and assume that surgery could be life-saving and that moderate disability or even independent outcome may be possible (although probably not as frequent as in younger patients)? Provide maximum conservative care including intubation and ventilation, or even hypothermia? Consider only medical treatment for stroke and antiplatelet therapy, strictly arguing that hemicraniectomy in older patients is not supported by evidence from randomized controlled trials? Or remain fully inactive, provide palliative care, and issue a do not resuscitate or intubate order? Whatever we choose, we recommend that all patients with that condition be entered in a prospective registry (such as DESTINY-R), which could provide more real-life data beyond what a randomized controlled trial would.

In our patient, we would try to get as much information as possible about the patient’s premorbid status and attitude toward life-prolonging measures, in general, and potential acceptance of surviving with different grades of disability. Because our 2 centers participate in DESTINY II, we would propose participation in the trial. If we worked elsewhere, then we would consider hemicraniectomy in this patient as early as possible and would definitely not wait for further midline shift, but we would certainly understand if others decide differently. We do not know yet what the likelihood of improved outcome will be (how could we?), but we assume that there is at least a chance for it.

Disclosures

None.

References


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