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Akins PT, Axelrod YV, Arshad ST, Guppy KH. Initial conservative management of severe hemispheric stroke reduces decompressive craniectomy rates. Neurocritical Care 2016;25:3-9.

Decompressive craniectomy (DC) for hemispheric stroke can lead to severe neurologic disability and hence this practice is controversial.[1,2] The European Decimal/Destiny/Hamlet trials of hemispheric stroke recommends early DC (within 48 h of stroke onset).[3,4] These trials required ischaemia affecting a large portion of the middle cerebral artery (MCA) territory, but clearly stated that mass effect and midline shift were not a requirement prior to DC. The authors planned this retrospective study with a hypothesis that only risks were present and no benefits of DC from hemispheric stroke patients could be attained, if the stroke did not cause mass effect on computed tomography (CT) head. A standardised database review was performed reviewing the electronic medical records for admissions of all patients who were admitted with hemispheric stroke from October 2007 to March 2015 in Kaiser Sacramento Medical Center in the Northern Central Valley, USA. Inclusion criteria were compared to the European early DC stroke trial.[3] Authors studied the files of 95 patients admitted to the neurocritical care unit with hemispheric stroke. Fifty-six patients >60 years were excluded from the study. Nine patients with <50% of MCA territory involvement and the National Institutes of Health Stroke Scale <15 were also excluded from the study. A retrospective study was done for thirty patients. The management protocol for hemispheric patients included hourly neuro checks, CT head at initial presentation, post-stroke day 1 and 2, neurosurgical consultation and additional CT imaging if clinically indicated. Patients developing mass effect were followed up through post-stroke day 4, and a head CT was done before transfer or earlier if the patient deteriorated neurologically. Involvement of the deep (M1), anterior division and posterior division of MCA territories was noted to determine whether ≥50% of the MCA territory was infarcted on CT imaging. Septal shift and pineal shift were measured. There was no time limit for DC, and this was done at the discretion of the treatment team. Modified Rankin scores (MRs) were calculated at hospital discharge and at 3 months. On hospital day 1, average midline septal shift was 3 mm and midline pineal shift was 1.6 mm. Four patients (13%) on hospital day 1 had midline septal shift of 8 mm or more. On hospital day 2, average midline shift was 5.9 mm at the septum and 3.6 mm at the pineal gland. Twenty-two per cent of MTO (medical treatment only) patients required mechanical thrombectomy compared to 8% of DC patients, but this difference did not reach statistical significance. DC was performed on the same day of admission in two patients, post-stroke day 1 in four patients, post-stroke day 2 in three patients and post-stroke day 3 in three patients. The median time was 2.5 hospital days (1.5 post-stroke days). No patient developed brainstem herniation before DC. Three out of four patients died in MTO group who refused to undergo DC. The surgical complication rate was 4/12 (33%). One patient expired after emergency re-operation whereas three patients developed delayed complications.

Overall DC was performed in 40% of the patients (12/30). Mortality in this series (13%) was less when compared to mortality in the European early DC stroke trial (22%). In the European trial, 43% of the patients undergoing early DC achieved a MRs ≤3 compared to 60% in this study. The surgical complication rate for DC was 20%, and for cranioplasty, it was 21.4% in a trial of DC for severe traumatic brain injury[5] which was similar to the 33% complication rate in this study.

A neurocritical care protocol for delayed DC for hemispheric stroke reduces DC rates by 60% without any increase in mortality or severe neurological dependency compared to the European early DC stroke trial results, which is the key finding of this study.

The single-centre nature of the study and small sample size are the major limitations of this study whereas recognition of a successive case series with a prospective catalogue, use of a standardised means for data collection, direct oversight and treatment of all patients by the authors and treatment of patients in a tertiary care centre are the strengths of this study.

The authors finally concluded that reserved DC for hemispheric stroke with radiographic mass effect on CT head reduced DC rates by 60%. Early conservative management and avoidance of unnecessary DC is beneficiary to patients by avoiding various complications related to DC and subsequent cranioplasty.

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Conflicts of interest

There are no conflicts of interest.

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