

Analyze the Outcomes of Decompressive Craniectomy in Patients Diagnosis with Malignant Ischemic Infarct (Middle Cerebral Infarcts)

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ABSTRACT

Aim: To examine the functional outcome of decompressive craniotomy treatment in patients diagnosis with malignant cerebral artery infarction.

Study Design: Retrospective cohort study.

Place & Duration of Study: Department of Neurosurgery, Per Syed Abdul Qadir Shah Jillani Institute of Medical Sciences, Gambat from 1st June 2017 to 31st December 2017.

Methods: A Total 29 patients of both genders diagnosis with middle cerebral artery infarction were included in this study. Patient's ages were ranging from 35 to 70 years. Patient's detailed medical history was examined after taking written consent. Patients with previous history of craniectomy, preexisting significant disability mRS>4, patients with pregnancy and life expectancy <3years were excluded from study. Mortality rate and functional outcome was recorded after decompressive craniectomy at 1, 3 and 6 months. Modified Rankin Scale <3 and mBI ≥60 considered as a favourable outcome.

Results: Out of 29 patients, 19 (65.52%) patients were males and 10 (34.48%) patients were females. 7 (24.14%) patients had ages of 35 to 45 years, 12 (41.38%) patients were ages between 46 to 55 years and 10 (34.48%) patients had ages 56 to 70 years. 17 (58.62%) patients had right hemisphere infarction while 41.38% had left. Overall mortality rate was 17.24% at six months after surgery. 13 (54.17%) patients had favorable outcomes on mRS and on mBI it was 50%. There was no major difference found according to outcomes p-value 0.072.

Conclusion: It is concluded that decompressive craniectomy declare better results regarding deaths in patients with middle cerebral infarct, but regarding functional outcomes at six months it shows poor results.

Keywords: Decompressive craniectomy, Outcomes, Middle cerebral artery infarct (ischemic infarct)

INTRODUCTION

The 10% of person suffering from ischemic stroke with mortality of 80% have 100% chances of MCA¹. Malignant cerebral infarction is the in more than 75% space-occupying edema of the middle cerebral artery section². For the person suffering from space-occupying hemispheric infarction because of inadequate medical cures, the decompressive craniectomy (DC) is very effective³⁻⁵.

Cerebral edema in involvement with infarcted brain tissue causes dislocation of brain tissue and raises the rate of intracranial pressure (ICP). The damage that occur at second can be prohibited by DC that produce compensatory hole to hold the swollen brain. Hemiparesis, hemiplegia, visual problems, and altered consciousness are the initial symptoms of MCA occlusion⁶. Though, the patients got worsen very fast in two days because of the company of huge effect which can get serious consequences.⁷ Some of the unsuccessful methods are severe medical management with osmotic diuretics, sedation, hypothermia, hyperventilation, and mechanical ventilation^{8,9}.

Initial study reported Dc as unsuccessful method, mainly with leading hemisphere participation, resulting in big number of surviving patients dependent on caregivers, raising their load. Also, there were two unwanted things, surgical complications and the cosmetic malformations.

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Neurosurgeons may hesitate to execute this method because there is very small amount of literature available on results of DC. In recent times, the mutual examination of three different studies reported that DC (decompressive craniectomy) can reduce the morbidity and mortality rate associated with the Middle cerebral artery infarction¹⁰. The current research was aimed to examine the functional outcomes and mortality rate in patients with ischemic infarct whom had undergone decompressive craniectomy.

MATERIALS AND METHODS

This retrospective study was conducted at Department of Neurosurgery, Per Syed Abdul Qadir Shah Jillani Institute of Medical Sciences, Gambat from 1st June 2017 to 31st December 2017. Twenty nine patients of both genders diagnosis with middle cerebral artery infarction were included. Patient's ages were ranging from 35 to 70 years. Patient's detailed medical history was examined after taking written consent. Patients with previous history of craniectomy, preexisting significant disability mRS>4, patients with pregnancy and life expectancy <3years were excluded from study. All the patients had undergone decompressive craniectomy surgery. Mortality rate and functional outcome was recorded after decompressive craniectomy at 1, 3 and 6 months. Modified Rankin Scale <3 and mBI ≥60 considered as a favourable outcome. All the statistical data was analyzed by SPSS 19.

RESULTS

There were 19(65.52%) male patients and 10 (34.48%) patients were females. Seven (24.14%) patients had ages of 35 to 45 years, 12(41.38%) patients were ages between 46 to 55 years and 10(34.48%) patients had ages 56 to 70 years. Seventeen (58.62%) patients had right hemisphere infarction while 41.38% had left (Table 1).We found 1(3.45%) death at 1 month after surgery, 2(6.90%) at 3 months and 5(17.24%) patients died at 6 months follow-up after surgical treatment. Overall mortality rate was 17.24% at six months after surgery. Thirteen (54.17%) patients had favorable outcomes on mRS and on mBI it was 50%. There was no major difference found according to outcomes p-value 0.072 (Tables 2-3).

Table 1:Demographic information of the patients

Variable	No.	%
Gender		
Male	19	65.52
Female	10	34.48
Age (years)		
35 - 45	7	24.14
46 - 55	12	41.38
56 - 70	10	34.48
Hemisphere Infarct		
Right	17	58.62
Left	12	41.38

Table 2: Mortality rate after surgery

Mortality	No.	%
After 1 month		
Found	1	3.45
Not Found	28	96.55
At 3 months		
Found	2	6.90
Not Found	27	93.10
6 months		
Found	5	17.24
Not Found	24	82.76

Table 3:Functional outcome at 6 months

Outcome	No.	%
mRS		
<3	13	54.17
>3	11	45.83
mBI		
<60	12	50.00
≥60	12	50.00

DISCUSSION

The role of Dc is accepted to be very imperative for the survival of patient with malignant MCA infarction. Some of randomized controlled trials have verified a decrease in mortality of patients DC undergoing patients¹¹⁻¹³. Though, the problem more pertinent to recent results is whether this life-saving surgery get better the quality of life and functional outcome of surviving patients.

In studies, male patient's population was high as compared to females 65.52% and 34.48%. These results were similar to some other studies conducted regarding outcomes of decompressive craniectomy in patients with ischemic infarct and reported 60 to 70%.¹⁴⁻¹⁶ We found that maximum number of patients were ages between 46 to 70

years. A study conducted by Jae won et al¹⁷ reported that patients of elderly ages had a high prevalence of ischemic infarct. The findings showsupgrading in the neurological results at one, three, and six months on mRS, mBI scales, but in conclusion it was still poor mBI (less than 60) and mRS scale (>4) at follow-up.^{18,19}The timing of the surgery, preoperative condition of the patient, and the age of the patient, these are the factors that effects the results.²⁰Onset of stroke the surgery must be done within two days.^{21,22} Also, rigorous neurological deficits at the time of admission and old age are well thought-out to be bad prognostic factors for the long-term functional outcome after DC.²³

In our study we found 3.45% mortality at 1 month after surgery, 6.90% at 3 months and 17.24% patients died at 6 months follow-up after surgical treatment. Overall mortality rate was 17.24% at six months after surgery. These results showed similarity to some other studies in which at 6 months after decompressive surgery mortality rate was 5 to 35%^{24,25}.

CONCLUSION

Middle cerebral artery infarction is one of the most common malignant disorder in neurosurgery settings. In our study, we concluded that decompressive craniectomy declare better results regarding deaths in patients with middle cerebral infarct, but it is also concluded that regarding functional outcomes at six months it shows poor results. We should have to do more work for better outcome and to reduce the mortality rate.

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