

# Comparison of the Efficacy of Standard Decompressive Craniectomy Combined with Cerebrospinal Fluid Circulation Reconstruction in the Treatment of Severe Craniocerebral Injury

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**Abstract: Objective:** To observe and discuss the clinical effect of standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction in the treatment of severe craniocerebral injury. **Methods:** Seventy patients who underwent surgery in our hospital were selected as subjects for this study. The time was from August 2016 to August 2018, and patients were divided into experimental group (35 cases) and control group (35 cases) according to the random number table method. The control group was treated with a single standard decompressive craniectomy according to clinical symptoms. The experimental group was treated with standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction. The surgical treatment effect, GCS (Glasgow Coma Scale) score and operation time were compared between the two groups. **Results:** After comparison, the surgical treatment effect of the experimental group was higher than that of the control group and there was a significant difference between the two groups ( $P < 0.05$ ). The GCS score and operation time of the experimental group were also better than of the control group and there was a significant difference the two groups ( $P < 0.05$ ). **Conclusion:** The use of standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction in the treatment of severe craniocerebral injury is more effective and worthy of widespread promotion and application.

**Keywords:** *standard decompressive craniectomy; cerebrospinal fluid circulation reconstruction; severe craniocerebral injury; combined therapy*

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## 1 Introduction

Severe craniocerebral injury refers to the damage on the patient's brain and its membrane from external violence. This condition is complicated and extremely common in clinical brain surgery. Common complications include traumatic brain edema and cerebral infarction, which may have a certain impact on the prognosis of patients<sup>[1]</sup>. There are many common factors that cause severe craniocerebral injury, such as fall from high altitude, traffic accidents, heavy and sharp objects hit and others, resulting in damage to the central nervous system of patients, and the extremely high mortality and disability rate<sup>[2]</sup>. With the advancement of clinical technology, the theory of cerebrospinal fluid circulation has been further enriched and developed. Standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction therapy can quickly identify the diagnosis of severe craniocerebral injury. This article has selected 70 cases of patients with severe craniocerebral injury and summarized as follows.

## 2 Information and methods

### 2.1 General information

Seventy patients with severe craniocerebral injury selected from August 2016 to August 2018 were divided into experimental group (35 cases) and control group (35 cases). The age of the experimental group was 16-

55 years old with an average of (35.5±20.65) years old while the age of the control group was 15-56 years old with an average of (35.5±20.12) years old. There was no difference in the basic information such as age between the experimental group and the control group (P>0.05), and the data were clinically comparable. The patients were excluded from the following: (1) lactating women; (2) patients with incomplete medical records after admission; (3) patients with cardiovascular and cerebrovascular diseases; (4) patients with mental disorders; patients with a history of drug allergy.

## 2.2 Treatment methods

The control group was treated with a single standard decompressive craniectomy according to the clinical symptoms. There were different decompression procedures according to the different location and size of the decompression window. Large frontotemporoparietal decompressive craniectomy can be performed in unilateral brain edema. Whereas, bilateral frontal crest and large bone flap decompression can be performed in diffuse brain edema. The experimental group underwent standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction. On the basis of the control group, the anterior skull base was exposed along the extra side approach, and the optic chiasm and the internal carotid artery pool were opened. If the cranial dura mater tension is too high after removing the bone flap which causes acute brain edema, it is necessary to remove some of the subdural hematoma to effectively

reduce intracranial pressure and input the drainage tube before closing the cranial cavity and performing suture. During the treatment, the nursing staff gave symptomatic supportive treatments such as nutrition nerve, dehydration and oxygen inhalation to the patients and continuously observed the current changes in vital signs..

## 2.3 Assessment and observation

a. Observe the effect of surgical treatment. Total effective rate=(effective+effective)/total number of cases×100%.

b. The patient's GCS scores and operative time were analyzed using the Barthel Index criteria. The results were expressed in percentage.

## 2.4 Statistical analysis

The data of 70 patients with severe craniocerebral injury were recorded in the statistical software SPSS 17.0. The difference between the two groups was tested by X<sup>2</sup> test and the measurement data was compared with T. The comparison results showed that P<0.05 was clinically comparable. Otherwise there is no comparability.

## 3 Results

### 3.1 Comparison of surgical results

The experimental results of the experimental group and the control group were significantly different, with clinical significance (P<0.05). See Table 1 below for details.

Table 1. Comparison of surgical results between experimental group and control group (n, %)

Group	Number of cases	Effective	Significant Effective	Ineffective	Death	Efficient
Experimental group	35	10	13	11	1	23 (65.71)
Control group	35	6	8	18	3	14 (40.0)

### 3.2 GSC score, comparison of operation time

The GSC score and operation time of the experimental group were better than that of the control group and the

comparison was significant with clinical significance (P<0.05), as shown in Table 2.

## 4 Discussions

Table 2. Clinical situation of the experimental group and the control group (x±s)

Group	Number of cases	GCS score	Operation time (h)
Experimental group	35	10.35±2.86	2.4±0.5
Control group	35	8.31±2.03	4.4±1.2

Severe craniocerebral injury is a common traumatic disease in clinical brain surgery which may lead to coma disturbance and cause damage to nerve function and even threaten the life of the patient. According to the World Health Organization report, the mortality and disability rate of craniocerebral injury in China will be more than that of cardiovascular and cerebrovascular diseases by 2020. After the patient suffers from illness, it will not only affect the quality of life but also affect the patient's psychology and physiology and causes economic burden to patients and their families<sup>[3]</sup>. Simple standard decompressive craniectomy has certain advantages in controlling intracranial pressure, and it is rapid and simple. The surgery is only external decompression which cannot alleviate cerebral edema and local compression of brain tissue. It has a certain impact on the final prognosis of severe craniocerebral injury, thus the effect is not satisfactory. According to the relevant data, the use of standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction have a good therapeutic effect on patients with severe craniocerebral injury. The theory of cerebrospinal fluid circulation reconstruction therapy is applied to the clinic, and the therapeutic effect is obviously improved. Combined therapy improves the amount of hypoxic-ischemic state of the cerebral contusion and laceration, reduces brain edema and the incidence of cerebral infarction. Moreover, it maximizes brain function recovery and improves the quality of patients' life<sup>[4]</sup>. In order to verify the efficacy of the combined method, 70 patients in our hospital

were selected for research analysis. The experimental group's surgical treatment effect, GCS score and operation time were better than that of the control group. The experimental group and the control group have significant differences ( $P < 0.05$ ) and have again verified the efficacy of the method.

In summary, the method of standard decompressive craniectomy combined with cerebrospinal fluid circulation reconstruction is effective, with highly safe, less complications and rapid recovery. It should be practiced, improved continuously and widely used in clinical practice.

## References

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