

# The Effect of Minimally Invasive Spinal Trauma Surgery on Spinal Trauma

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**Abstract: Objective:** To study the effect of minimally invasive spinal trauma surgery on spinal trauma.

**Methods:** After 60 patients with spinal trauma were selected, the patients in observation group was treated by minimally invasive spinal trauma surgery, while the patients in control group was given the routine treatment. **Results:** After treatment, the observation group improved significantly in operation related indexes, complication rate, pain degree, quality of life, JOA score and ODI score ( $P < 0.05$ ). **Conclusion:** Minimally invasive spinal trauma surgery is effective in the treatment of spinal trauma.

**Keywords:** Minimally invasive; Spinal trauma surgery; Spinal trauma

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Clinically, spinal trauma is relatively common. The lesion location of the patient is spinal trauma, including tissue, soft tissue, nerve structure, bone structure and other aspects. The causes of trauma are due to personal attacks, traffic accidents, natural factors and work-related injuries. Traditional surgical treatment for the patient is not ideal in clinical efficacy. The patient has a large amount of intraoperative hemorrhage, serious trauma, long operation time, so the postoperative rehabilitation effect of the patient is not ideal<sup>[1]</sup>. Therefore, after relevant clinical researches were carried out, the minimally invasive surgical treatment is proposed, which can effectively make up for the above deficiencies, improve the prognosis of patients, and obtain the ideal therapeutic effect of patients.

## 1 Data & Methods

### 1.1 Data

From May 2019 to April 2020, 60 patients with spinal trauma were selected. All of them agreed to enter the group and have identified the purpose of the experiment. They were divided into groups by lot. The data of the observation group were 30 cases, including 16 males, aged between 33 and 66 years old, averagely 48.5 years old. The data of the control group were 30 cases, including 15 males, aged between 30 and 65 years old, with a median of 48.0 years old. The data of patients in the two groups are similar; and after  $t$  test or  $\chi^2$  test,  $P > 0.05$ .

### 1.2 Methods

The control group was given routine treatment: general anesthesia and prone position were adopted for the patient, and the incision was located at the posterior midline of the patient's spine, close to the patient's lamina periosteum and spinous process, by which, his paraspinal muscle can be stripped to the lateral edge of the patient's facet joint. The retractor was used to open the muscle and completely expose the wound, and the nail rod was implanted vertically to carry out the treatment of spinal canal decompression fracture.

The observation group was treated with minimally invasive spinal trauma surgery: general anesthesia and supine position were carried out for the patient, and C-arm X-ray machine was used to fully understand the wound of the patient and carry out incision operation. The incision position was the lateral edge of pedicle of the vertebral arch. After the above operation was completed, the longest muscle and multifractal muscle

of the patient were separated, the muscle and soft tissue of the patient were expanded, and then the operation channel was placed. The pedicle probe was used to screw the pedicle screw, implant the screw rod, and then expand the reduction fracture. After the above operation, anti-infection treatment was carried out for the patient to avoid adverse consequences for the patient.

### 1.3 Research on effect

Pain degree and quality of life: use the pain degree scale and the scale of self-made quality of life to carry out data statistics<sup>[2]</sup>.

JOA Score and ODI Score: Data were collected by using the Japanese Orthopaedic Association (JOA) scoring method and Oswestry Dysfunction Index

Questionnaire (ODI).

### 1.4 Statistical methods

According to the SPSS 22.0 statistical software, the counting data were represented by (%) and the measurement data were represented by (mean ± standard deviation),  $\chi^2$  and *t* test was performed. The inspection standard  $\alpha = 0.05$

## 2 Results

After treatment, the observation group improved significantly in operation related indexes, complication rate, pain degree, quality of life, JOA score and ODI score, compared with the control group,  $P < 0.05$ . Complications include the incision infection, hemorrhage and swelling (Table 1).

**Table 1.** Comparison of Two Groups of Patient Data

| Group                 | Duration of surgery (min) | Intraoperative hemorrhage (ml) | Hospitalization time(d) | Incidence of complications (%) | Degree of pain (points) | Quality of life (points) | JOA score (points) | ODI score (points) |
|-----------------------|---------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------|--------------------|--------------------|
| The observation group | 62.15±4.22                | 132.15±10.25                   | 8.11±1.12               | 2(6.66)                        | 1.21±0.15               | 91.01±3.22               | 23.72±1.96         | 22.36±4.18         |
| The control group     | 175.66±40.26              | 302.15±44.22                   | 14.65±1.22              | 8(26.66)                       | 3.32±1.01               | 83.61±5.67               | 19.15±4.57         | 27.22±3.46         |
| <i>T</i>              | 15.3584                   | 20.5128                        | 21.6292                 | 4.3200                         | 11.3183                 | 6.2159                   | 5.0337             | 4.9056             |
| <i>P</i>              | <0.05                     | <0.05                          | <0.05                   | <0.05                          | <0.05                   | <0.05                    | <0.05              | <0.05              |

## 3 Discussion

Clinical analysis of the spinal column can support various organs, ensure the whole-body movement, and play a certain role in protecting the spinal cord and internal organs. In human body, the role is more important. If spinal column injury occurs, the nerve of the patient can be damaged with unimaginable consequences, which can lead to limb movement restriction of the patient, incontinence of urine and feces of the patient, and paraplegia of the patient and have the danger of life safety, if the damaged part of patient is too high. For patients with spinal trauma, it is very necessary to carry out timely and effective treatment. The analysis of the clinical characteristics of traditional surgery is not conducive to the recovery of patients, and it takes a long time for patients to recover. With the improvement of science and technology, minimally invasive surgery is widely used in the clinic. With the use of advanced medical devices to provide effective treatment for patients, the surgical incision of patients can be reduced to a minimum. During the

operation, it will not affect the muscle stripping of the patients, but it can affect the internal environment of the patients. The degree of its influence can be reduced to the lowest, so it has strong relative stability. The use of minimally invasive surgery can significantly reduce the destruction and injury of the surrounding tissue, fully make up for the deficiency of traditional open surgery and effectively reduce the amount of bleeding, which is beneficial to the rapid recovery of patients and significantly reduce the complications of patients, including incision infection, bleeding and swelling<sup>[3]</sup>.

Clinical analysis of spinal trauma can lead to various clinical symptoms such as nerve damage, spinal pain, limb movement limitation, etc. Timely surgical treatment should be carried out for patients, which can complete spinal function of patients and stabilize the spinal structure of patients. Currently, minimally invasive surgery is recommended clinically.

Surgical treatment should be carried out for patients with common spinal trauma clinically. Because patients have many traumatic factors, after trauma, it is easy to hinder nerve transportation, and patients are

prone to incontinence. The analysis shows that spinal trauma has a great impact on human body function and the patient's condition is complicated<sup>[4]</sup>. Therefore, clinical researches have been conducted on how to improve the prognosis quality and clinical treatment effect of patients with this disease. For patients with severe illness, normal walking cannot be performed. After the patient suffers from the spinal trauma, if he fails to receive timely treatment, the injury degree can be aggravated, which can lead to paraplegia or death of him. Therefore, it is very important to select a reasonable surgical method, analyze the treatment principles of patients with this disease, reconstruct the spinal structure of patients, and ensure the complete spinal function of patients. Operation methods include traditional surgery and minimally invasive surgery.

Due to the rapid development of China's transportation industry, spinal trauma patients are becoming more and more common clinically, and the incidence rate is increasing year by year. For human spine, blood vessels and nerve are densely distributed around<sup>[5]</sup>. If dislocation occurs, it can seriously affect the surrounding tissues, compress blood vessels and nerve, thus causing serious impact on the normal activities of the body. For spinal trauma patients, timely and effective treatment is the key measure to relieve the clinical symptoms of patients, reduce the disability rate of patients and promote the effective recovery of spinal function of patients.

Clinical analysis of spinal trauma patients shows that the patient's disease progress is slow and belongs to surgical diseases. In the process of surgical treatment, reasonable selection of surgical methods should be made according to the actual situation of patients. Analysis of the current situation in China shows that the causes of spinal trauma patients are mostly car accidents, serious injuries, and patients cannot walk normally. If the injured part of patients is close to the neck, it can lead to more serious injuries and possibly death. Traditional open surgical treatment should be carried out for patients. Patients are prone to decline their body functions continuously after surgery. They cannot normally control their lower limbs after surgery. Patients will lose consciousness of their lower limbs. After these symptoms occur, blood dredging measures should be taken to avoid ulceration of their lower limbs. In addition, spinal trauma can cause serious injury to the internal organs of patients. The reason is that the internal organs function disorder is

caused by incontinence of urine and feces of patients. Minimally invasive surgical treatment will not change this phenomenon effectively to ensure the integrity of muscle tissue of patients.

At present, video technology and Internet technology are continuously maturing. For many high-tech medical equipment, information can be intelligently identified. Minimally invasive surgery is relatively common in clinical practice. It is highly recognized by the academic community when it is applied to the treatment of spinal trauma patients. In the traditional surgery process, bone reduction is mandatory, and patients have high risks<sup>[6]</sup>. Minimally invasive surgery can complete spinal trauma treatment softly. However, traditional surgical methods also have certain defects on the fixed support plate. The fixed support plate needs to bear concentrated stress, which increases the possibility of failure of the support plate, and patients are prone to re-occurrence of huge injuries. In addition, the patients' general satisfaction is not high after treatment, and infection complications are easy to occur and with certain treatment limitations. If the patient's condition is serious, conventional surgical treatment will have a worse effect. With fewer postoperative complications and faster postoperative wound healing, minimally invasive surgery requires less operation space, and patients are easy to operate successfully<sup>[7]</sup>. Relevant literature reports that minimally invasive surgery can help patients walk early, because the incision is small, the pain of the patients is light, and the adverse emotions of the patients are less, which is conducive to the postoperative recovery of the patients, indicating that the operation is efficient and feasible.

There is a certain clinical effect in carrying out routine surgical treatment for patients with spinal trauma, but the patients are featured by severe pain and trauma and the risk of operation is high, so the patients are prone to postoperative complications, and the pain degree of the patients is greater, therefore, minimally invasive spinal trauma surgery is proposed clinically, which can significantly reduce the amount of intraoperative bleeding, shorten the operation time of patients, and shorten the hospitalization time of patients at the same time. The degree of pain was relieved effectively, and the incidence of complications was significantly reduced.

With the rapid development of clinical medical technology, minimally invasive technology is widely used in the treatment of spinal trauma. Compared with traditional surgery, the clinical advantage is more

obvious<sup>[8]</sup>. It is of great clinical significance in reducing patient complications and improving the quality of daily life of patients. Analysis of minimally invasive spinal trauma surgery is a minimally invasive concept. During the surgery, the muscle of patients is dissected through small incisions; and compared with traditional surgery, the degree of muscle injury of patients is lower.

The experimental results of this group: the observation group improved significantly in terms of operation-related indexes, incidence rate of complications, degree of pain and quality of life. This group of clinical data confirmed that minimally invasive spinal trauma surgery is clinically worthy of reference, which is one of the clinically recognized effective surgical methods, and has high clinical application value.

According to the above theories, minimally invasive spinal trauma surgery has an ideal effect on spinal trauma, which can promote patients in terms of operation-related indicators, complication rate, pain degree and quality of life, and is worthy of the clinical recommendation. In the follow-up analysis and research, the number of samples can be appropriately increased, and the treatment steps of minimally invasive spinal trauma surgery can be correspondingly analyzed.

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