

Clinical Analysis of Posterior V-osteotomy in the Treatment of Traumatic Kyphosis

Tianhui Liu, Jianmin Cui*

Shizhu People's Hospital, Chongqing 409100, China

Abstract: *Objective:* To analyze the effect of posterior V-osteotomy in the treatment of traumatic kyphosis. *Methods:* From August 2018 to August 2020, 40 patients with kyphosis were randomly divided into observation group and control group. *Results:* The postoperative Cobb angle of the observation group was $(8.29 \pm 1.24)^\circ$ better than that of the control group $(15.68 \pm 2.73)^\circ$, $P < 0.05$; The preoperative Cobb angle of the observation group was $(49.78 \pm 4.15)^\circ$ compared with that of the control group $(50.11 \pm 4.23)^\circ$, $P > 0.05$; The incidence of postoperative complications and recurrence rate in the observation group were 5.00% and 5.00% respectively, which were lower than 25.00% and 30.00% in the control group ($P < 0.05$). *Conclusion:* Posterior V-osteotomy for traumatic kyphosis can improve Cobb angle, reduce the risk of postoperative complications and recurrence, which is safe and feasible.

Keywords: Kyphosis; Posterior vertebral V-osteotomy; Clinical effect

Publication date: March, 2021

Publication online: 31 March, 2021

***Corresponding author:** Jianmin Cui, 812741946@qq.com

After spinal trauma, kyphosis can be induced. If the diagnosis and treatment is poor, fixation failure, local malunion of lesions, kyphosis can be induced. The typical characteristics are body fatigue, back deformity, traumatic pain. Amputation treatment is needed in severe cases, which seriously affects the daily life of patients^[1]. With the continuous development of surgical technology in our country, combined with the deepening of clinical research on patients with traumatic kyphosis, posterior spinal V-osteotomy is gradually applied in clinical. In order

to analyze the curative effect of posterior V-osteotomy in patients with kyphosis, 40 patients were selected to carry out the study.

1 Material and methods

1.1 Information

The study was conducted in August 2018 and terminated in August 2020. 40 patients with kyphosis were selected as samples and randomly divided into two groups. There were 13 males and 7 females in the observation group, aged from 15 to 64 years old (mean 38.74 ± 2.78) years old. The mean time of trauma was (2.75 ± 0.84) months from 1 to 4 months, including 11 cases of thoracic trauma and 9 cases of lumbar trauma; There were 14 males and 6 females in the control group. The mean age was (38.82 ± 2.83) years (range, 16-65 years). The mean time of trauma was (2.83 ± 0.91) months (range, 2-4 months). There were 12 cases of thoracic trauma and 8 cases of lumbar trauma. With the consent of the ethics committee. Compared with the data of selected patients with kyphosis, $P > 0.05$.

1.2 Inclusion and exclusion

Selection criteria: All patients were diagnosed as kyphosis by imaging examination and routine examination; All patients were accompanied with different degrees of deformity, pain and fatigue, and all of them had informed consent.

Exclusion criteria: Those who are difficult to tolerate surgical treatment, those who transfer to hospital or stop treatment due to their own reasons, and those who lack clinical data were excluded^[2].

1.3 Treatment

The control group was treated with conventional anterior vertebral fracture reduction and internal fixation, prone position after general anesthesia, distraction of vertebral body through posterior approach, fusion and fixation after bone grafting.

The patients in the observation group were treated with V-shaped osteotomy through posterior approach. The patients were guided to take the supine position and given tracheal intubation anesthesia. Then X-ray examination was performed to locate the focus. Combined with imaging examination, a longitudinal incision of about 3.5 cm was made in the posterior median position of the spine. The skin was cut layer by layer. After the vertebral body was fully exposed, the osteotomy space was removed. After exposing the dural sac, aseptic mask was prepared to protect the dural sac. Then, the facet of the fractured side was excised to keep the osteotomy tip in the posterior vertebral space, and the other vertebral bodies were subjected to V-shaped osteotomy with the same scheme. After the osteotomy, the fixation plate was used to press the truncated part to promote the closure of the posterior osteotomy, so as to correct the kyphosis deformity. Then, the fixation rod was used to connect the spinal screw to close the osteotomy surface. After the above operation, the fixation was carried out. The negative pressure drainage tube was

inserted^[3].

1.4 Observation indexes

The patients with kyphosis were treated with different surgical methods, and the differences of Cobb angle between preoperative and postoperative groups were compared and analyzed; The postoperative complications such as abdominal pain, skin infection and skin ulceration were recorded and analyzed; Postoperative recurrence was recorded.

1.5 Statistical study

SPSS 33.0 was used to calculate the data of patients with kyphosis in this paper, and %, $\bar{x} \pm s$ were used to record the relevant data of patients, and the test forms were χ^2 and t. There was statistical difference ($P < 0.05$).

2 Results

2.1 Comparison of Cobb angle between groups of patients with kyphosis

The postoperative Cobb angle of the observation group (8.29 ± 1.24) ° was better than that of the control group (15.68 ± 2.73) °, $P < 0.05$; The preoperative Cobb angle of the observation group was (49.78 ± 4.15) ° compared with that of the control group (50.11 ± 4.23) °, $P > 0.05$. See Table 1.

Table 1. The difference of Cobb angle between different groups was compared ($\bar{x} \pm s$)

Group	Before operation	After operation
Observation group (n = 20)	49.78±4.15	8.29±1.24
Control group (n = 20)	50.11±4.23	15.68±2.73
t	0.2490	11.0222
P	>0.05	<0.05

2.2 Risk comparison of postoperative complications in patients with kyphosis

In the observation group, 1 case (5.00%) had abdominal pain, and the complication rate was 5.00%; In the control

group, there were 3 cases (15.00%) of abdominal pain, 2 cases (10.00%) of skin infection, and 1 case (5.00%) of skin ulceration. The incidence of complications was 30.00%, $P < 0.05$. As shown in Table 2.

Table 2. Comparison of complications between groups after different surgical treatment (n, %)

Group	Abdominal pain	Skin infection	Skin ulceration	Incidence rate
Observation group (n = 20)	1(5.00)	0(0.00)	0(0.00)	5.00
Control group (n = 20)	3(15.00)	2(10.00)	1(5.00)	30.00
χ^2	-	-	-	4.3290
P	-	-	-	<0.05

2.3 Comparison of recurrence risk in patients with kyphosis

In the observation group, 1 case recurred, and the recurrence rate was 5.00%; The control group had 5 cases of recurrence, the recurrence rate was 25.00%, the difference was compared, X² value was 3.1373, $P < 0.05$.

3 Discussion

The incidence rate of kyphosis is high, and with the gradual increase of kyphosis angle, patients may have back pain symptoms. After the occurrence of kyphosis deformity, the risk of patients complicated with chicken breast deformity, pectus excavatum and other diseases is high, which can lead to unequal length of both lower limbs, pelvic imbalance, if not timely diagnosis and treatment, it can also make the fracture malunion, and then induce severe diseases such as spinal cord compression, paralysis or persistent pain^[4-5]. The clinical diagnosis and treatment of traumatic kyphosis is difficult, and the patients suffer a lot during the onset, which seriously affects the quality of life of patients. Up to now, the clinical treatment of kyphosis deformity mostly adopts surgical scheme to improve clinical symptoms, prevent progressive aggravation of deformity, improve nerve compression and relieve pain, which is conducive to postoperative recovery of patients^[6]. Although the conventional surgical scheme can control the disease, but the intraoperative trauma is large, the risk of postoperative complications is high, and has a certain recurrence rate, which is not conducive to the recovery of patients. Therefore, exploring an efficient surgical scheme for the treatment of kyphosis is still a hot spot in clinical research. In recent years, posterior spinal V-type osteotomy has been gradually applied in clinical practice and achieved good results in the treatment of traumatic kyphotic deformity. Compared with traditional surgical procedures, V-type osteotomy has the following advantages: During the operation, there is no need to take bone from iliac bone, but only to carry out bone graft between osteotomy and posterolateral. The operation is simple, safe and reliable, and the amount of single bone graft and bone graft is small; Transplantation of bone fragments through the vertebral osteotomy surface can adjust the height of the spine, but also enhance the strength of the ligament, and the operation is safe. Although

the height of the spine is changed, it does not affect the normal life of the patient. During the operation, the spinal cord injury can be reduced by using the monitor; Decompression of nerve root can adjust vertebral height, relieve nerve root tension, and eliminate nerve root stimulation and accompanying symptoms^[7].

Combined with the analysis of the research results, the postoperative Cobb angle of the observation group (8.29 ± 1.24)° was better than that of the control group (15.68 ± 2.73)°; The incidence of postoperative complications in the observation group was 5.00%, which was lower than 30.00% in the control group; The recurrence rate of observation group was 5.00%, lower than 30.00%, $P < 0.05$. It is suggested that compared with conventional surgical intervention, posterior V-osteotomy has better curative effect, can improve the Cobb angle, reduce the risk of postoperative complications, reduce the recurrence, and has important application value. Analysis of the reasons shows that posterior V-osteotomy treatment, operation under X-ray direct vision, can reduce the impact of external factors on the quality of operation, and there is no need to cut off the vertebral ligament during the operation, which is harmful to the human body. It has less damage and more promotion value. However, we should pay attention to the following problems in the actual treatment of posterior V-shaped osteotomy. The lamina and transverse process should be selected reasonably before operation; In order to reduce the injury of nerve root and dural sac, the operation should be gentle and precise; Postoperative nursing work should be strengthened to promote the recovery of patients^[8].

In conclusion, patients with traumatic kyphosis underwent posterior vertebral V-osteotomy treatment, can reduce the risk of postoperative complications, reduce recurrence, is conducive to improving the quality of life of patients, has clinical value.

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