

Effect of Hollow Nail Combined with Titanium Cable Internal Fixation in the Treatment of Patellar Fracture

Guorui Ding

Department of Orthopedics, Dongsheng People's Hospital, Ordos 017000, China.

Abstract: Objective: To observe the effect of hollow nail combined with titanium cable internal fixation in the treatment of patella fracture. **Methods:** A total of 60 patients with patellar fracture treated in our hospital from September 2019 to February 2022 were selected as subjects, and randomly divided into control group (30 patients treated with conventional surgical protocol) and observation group (30 patients treated with hollow nails combined with titanium cable internal fixation). The recovery of the two groups was analyzed. **Results:** Comparing the operation time, intraoperative blood loss, fracture healing time and loss Angle between the two groups, the observation group had advantages, $P < 0.05$. Compared with the knee function scores of the two groups, there was no difference before surgery, 1 week, 3 weeks, 5 weeks after surgery, the observation group had advantages, $P < 0.05$. **Conclusion:** In the treatment of patients with patellar fracture, using the hollow nail combined with titanium cable internal fixation can reduce the intraoperative trauma of patients, and promote the recovery of patients' knee function as soon as possible.

Keywords: Cannulated Screw Combined With Titanium Cable Internal Fixation; Patellar Fracture

Introduction

Among the common clinical fracture diseases, patella fracture is the most common fracture type with a high incidence. The patella plays a very important role in the daily normal knee joint activity. From the clinical diagnosis, we can see that there are many inducing factors of patella fracture, direct violence or abnormal traction between quadriceps femoris may lead to fracture. Such fracture will directly affect the knee extension function of patients, and lead to the destruction of the integrity of the patella joint surface^[1-2]. In the process of treating such fracture patients, it is more necessary to take effective treatment measures to promote the recovery of patients as soon as possible. According to hollow nail combined with titanium cable internal fixation, the treatment of this part of patients is rapidly applied in clinical practice. This study mainly analyzes the specific value of this surgical treatment.

1. Data and methods

1.1 General information

According to the way of comparative surgical treatment, 60 patients with patellar fracture who were treated in our hospital from September 2019 to February 2022 were selected as subjects and randomly divided into the control group (30 cases, treated with conventional surgical scheme) and the observation group (30 cases, treated with hollow nail and titanium cable internal fixation). In terms of patient composition, the control group had 16 males and 14 females, aged between 45 and 75 years, with an average of (62.34 ± 1.83) . In the observation group, there were 17 males and 13 females, aged between 43 and 74 years, with an average of (63.04 ± 1.94) . Comparison of basic data, $P > 0.05$.

1.2 Method

The control group was treated with routine surgery, and internal fixation with Kirschner wire tension band was carried out. The body position was kept in supine position, and the anesthesia method was intravenous general anesthesia. After disinfection of the wound surface, the knee joint was bent about 20 degrees. The incision was made in the anterior and central position of the patient's patella, and the subcutaneous tissue was exposed layer by layer to promote the exposure of the fracture end, and the blood accumulation in the joint was cleaned up, and the temporary fixation was carried out with reduction forceps, and the Kirschner wire was used to fix the patellar joint surface after the reduction was smooth. After the accurate reduction, the surgical opening was sutured layer by layer. The observation group was treated with hollow screw and titanium cable internal fixation. During the operation, the body position was selected in supine position, and the conventional method was used to stop the bleeding, and the patient was slightly under the knee raise it, bend the knee joint about 20 degrees, and cut it at the front and middle of the patient's knee joint, so that the fracture end can be fully exposed, and the blood accumulation in the joint can be treated in the same way as the control group. Then the fracture reduction is carried out, and the flatness of the patellar joint surface is restored. After the knee joint is fixed with tissue clamp, the knee joint is flexed about 20°~30°, and the guide pin is inserted for temporary fixation. The fixed position is determined with the help of C-arm machine, and then the hollow screw is inserted, the titanium cable is crossed in the front end of the patella, and the lock buckle needs to be placed in the expected position on the bone surface. After the reduction is accurate, the surgical opening is conventionally sutured. Both groups of patients need to undergo anti-infection treatment during surgery.

1.3 Observation indicators

The operation time, intraoperative bleeding, fracture healing time and loss angle of the two groups should be counted during the comparison of surgical treatment. The knee joint function of the patients should be evaluated with Lysholm score before and after the operation for 1 week, 3 weeks and 5 weeks.

1.4 Statistical methods

The data related to the two groups were processed with SPSS20.0, and the measurement data were expressed with mean \pm standard deviation. The difference was statistically significant in t test ($P < 0.05$).

2. Results

2.1 Comparison of operation time, intraoperative bleeding, fracture healing time and loss angle between the two groups

Compared with the operation time, intraoperative bleeding, fracture healing time and loss angle of the two groups, the observation group has advantages ($P < 0.05$), as shown in Table 1 below.

Table 1 Comparison of operation time, intraoperative bleeding, fracture healing time and loss angle between the two groups ($\bar{x} \pm s$)

Groups	Number of cases	Operation time (min)	Intraoperative bleeding volume (ml)	Fracture healing time (week)	Loss angle (°)
Observation group	30	42.54 \pm 10.34	196.53 \pm 20.24	10.12 \pm 0.54	10.32 \pm 0.41
Control group	30	52.56 \pm 11.22	213.21 \pm 17.13	12.51 \pm 0.23	15.12 \pm 0.52
<i>t</i>	-	12.425	12.141	10.252	12.436
P	-	0.001	0.001	0.001	0.001

2.2 Knee joint function score of two groups

Compared with the knee joint function score of the two groups, there was no difference before the operation. The observation group had advantages at 1, 3 and 5 weeks after the operation ($P<0.05$), as shown in Table 2 below.

Table 2 Knee joint function score of two groups ($\bar{x} \pm s$)

Groups	Number of cases	Preoperative	1 week after operation	3 weeks after operation	5 weeks after operation
Observation group	30	42.05±1.34	52.53±2.24	65.12±3.54	75.32±2.41
Control group	30	42.56±1.22	47.21±3.13	56.51±2.23	66.12±3.52
<i>t</i>	-	1.242	10.425	12.725	13.425
<i>P</i>	-	0.801	0.001	0.001	0.001

3. Discussion

Patella fracture is the most common type of fracture in orthopedics, which will directly affect the normal physiological activities of patients and reduce the quality of life of patients. Moreover, this type of fracture is mostly caused by sudden external forces, and there is a large trauma. Surgical treatment is the most important way to treat patella fracture in the current clinical treatment, which can promote the rapid recovery of the normal physiological structure of the fracture site of patients, and promote the improvement of the knee joint function of patients [3-4].

In the conventional surgical treatment, the treatment is mainly carried out by Kirschner wire internal fixation, assisted by steel wire tension band. However, the steel wire is prone to fatigue, and it is easy to break the steel wire during the continuous torsion and other operations. At the same time, during the operation process, it may affect the adjacent synovial tissue of the patient, increase the incidence of postoperative pain, infection and other complications, and more likely affect the normal activity of the knee joint. It is not conducive to the recovery of the patient. The treatment is carried out by hollow nail combined with titanium cable internal fixation, which is relatively simple, and the hollow nail will not cause compression to the patient's tendon, and will cause little negative stimulation to the surrounding tissue, which can avoid loosening or slipping [5]. At the same time, titanium cable has high biocompatibility, high mechanical strength, and generally does not break, which is helpful for patients to recover after surgery. In this study, the observation group was treated according to hollow nail combined with titanium cable internal fixation surgery. Combined with the observation, it can be seen that under the effect of this surgical scheme, the patients suffered little trauma during surgery, and the knee joint function recovered relatively quickly during the recovery process, which can effectively improve the surgical treatment effect of patients with patellar fracture.

Based on this study, hollow nail combined with titanium cable internal fixation can be preferentially selected in the surgical treatment of patellar fracture patients, which can effectively improve the clinical surgical effect of this part of patients and help patients recover the damaged joint function.

References

- [1] Fan SY, Zeng ZY, Song YX. Clinical Effect of Internal Fixation with Titanium Wire and Titanium Cable with Holes in the Treatment of Patellar Fracture [J]. *Journal of Clinical Orthopedics*, 2022,25 (03): 417-419.
- [2] Wang HC, Sang YT. The Effect of Arthroscopic Assisted Minimally Invasive Percutaneous Closed Reduction in the Treatment of Non-serious Comminuted Patellar Fracture (fracture block≤3) [J]. *China Contemporary Medicine*, 2022,29 (14): 81-85.
- [3] Xu P, Xu C, Qiang XJ. Clinical Observation on the Treatment of Patellar Fracture with Hollow Nail and Titanium Cable Internal Fixation Combined with Percutaneous Tension band Fixation [J]. *Practical Clinical of Integrated Traditional Chinese and Western Medicine*, 2020,20 (11): 25-26.
- [4] Zhou WS, Fan TC, Bai YX, Chilie GG. Clinical Observation on treatment of patellar fracture with hollow nail

titanium cable tension band [J]. *Tibetan Medicine*, 2019, 40 (04): 154-155.

[5] Xie JB. Study on the Application of Closed Reduction Combined with Mini-incision Cannulated Screw and Titanium Cable in the Treatment of Patellar Fracture [J]. *Contemporary Medicine*, 2019, 25 (22): 128-129.