Case report

Clinical application of minimal invasive arthroscope on patella fracture surgery

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Abstract: The aim of the research is to perform the application of minimal invasive arthroscope on patella fracture surgery. A total of 100 patients with the cases of patella fracture were selected from our hospital and the Second Xiangya Hospital's Orthopaedic Ward. These patients were divided into 'Observation Group' and 'Comparison Group'. The former was treated with traditional open surgery whereas the latter used the arthroscopic surgery. The postsurgical score indicated statistically significant differences ($P < 0.05$) in the Lysholm Knee and Oswestry Low Back pain scale. By performing arthroscopic surgery on patella fractures, the patients' recovery was accelerated while the pain was greatly reduced, which in turn, improved the quality of patients' life and provided valuable clinical value.

Keywords: Arthroscope; Patella fracture; Pain scoring

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Introduction

Clinical signs of patella fracture are subcutaneous hematoma, sharp joint pain, *etc.*, which may affect the daily life and activities of patient. Medical research believes that minimal invasive arthroscope used on patella fracture surgery may bring significant improvements. This research is to probe the clinical application of minimal invasive arthroscope on patella fracture surgery by choosing 100 patients from two hospitals.

Materials and methods

General description

A total of 100 patients from the Second Xiangya Hospital's Orthopaedic Ward, who were admitted from March 2015 to March 2016, were recruited and divided randomly into observation and comparison group. All patients had given their consent to participate in this study. Observation Group comprised 50 patients: 30 were male and 20 were female ranging from 24 to 78 (43.62 ± 13.56) years old.

Inclusion and exclusion criteria:

- 1) All patients proven to have patella fracture shown by x-ray who need to be admitted to hospital for surgery.
- 2) All patients who do not have severe cardiovascular disease. Gender, age, and clinical performance are the general basis, in which, the difference is comparable and not statistically significant ($P > 0.05$).

Sample grouping

The “Comparison Group” was treated with traditional open surgery while the “Observation Group” used minimal invasive arthroscopic surgery.

Procedural treatment

First, hemostasis on thigh was prevented and a normal sterilization was carried out. The medical staff straightened the patient’s knee; entered using inner and outer knee, and placed 2 cm upper of patella bone as auxiliary entrance. Blood clot on bones was cleaned up and the cartilage was extracted. Medical staff reset the fracture site and repositioned it with clamps. An orthopaedic surgeon secured the fracture site, besides using 2 cannulated lag screws to reposition it. The first screw inserted perpendicular from patella fracture site, while the other screw must be kept 2 cm away from the first screw, and monitored arthroscopically. The 2 screws fixed the fracture patella and secured the fracture site.

Observation indicator

Observation on recovery and postoperative pain was monitored based on Lysholm Knee Pain Score grading. Overall score was 100. If the marks obtained were lower than 70, it indicated that joint recovery condition was not good. Oswestry Low Back Pain Score was set to ascertain postoperative pain suffered by patient. The overall mark was 50, in which, lower mark achieved means less pain was experienced.

Statistical analysis

Data processing was performed on SPSS 17.0 Statistic Software. The data were expressed as mean $\pm$ standard deviation ($\pm s$). $P < 0.05$ indicated a statistically significant difference.

Results

Post operation comparison by Lysholm Score

Based on the Lysholm Score of both groups (*Table 1*), recovery scoring for Observation Group after one month was 51.23 ± 5.62 while scoring for 12 month post operation was 85.62 ± 9.23 ; whereas Comparison Group scored 48.62 ± 4.95 one month post operation and 63.28 ± 9.04 twelve months post operation. Differences between both groups were statistically significant ($P < 0.05$).

Table 1 Postoperative Lysholm knee scoring scale of two groups

Group	<i>n</i>	Post operation 1 month	Post operation 3 months	Post operation 6 months	Post operation 12 months
Observation	50	51.23 ± 5.62	62.39 ± 7.85	78.95 ± 8.52	85.62 ± 9.23
Comparison	50	48.62 ± 4.95	55.63 ± 6.87	59.36 ± 8.21	63.28 ± 9.04
χ^2		11.981846	9.171528	21.581461	12.967326
P		0.008252	0.012632	0.005236	0.003451

Postoperative Oswestry Low Back Pain Score comparison between two groups

From the Oswestry Low Back Pain Score (*Table 2*), we discovered that the scoring for Observation Group was 31.52 ± 5.37 one month post operation and 15.29 ± 2.45 twelve months after operation. As for Comparison Group, the score was 35.36 ± 25.16 one month post operation and 27.36 ± 2.84 twelve months after operation. Differences in Oswestry Score for both groups were statistically significant ($P < 0.05$).

Table 2. Postoperative Oswestry pain scoring scale of two groups

Group	n	Post operation 1 month	Post operation 3 months	Post operation 6 months	Post operation 12 months
Observation	50	31.52 ± 5.37	25.15 ± 4.59	20.38 ± 3.62	15.29 ± 2.45
Comparison	50	35.25 ± 5.16	33.67 ± 4.62	30.96 ± 3.98	27.36 ± 2.84
χ^2		16.981258	15.174625	8.583694	14.961584
P		0.008258	0.012164	0.002364	0.002541

Discussion

Patella fracture is common in orthopaedic as it can affect a wide range of people. There are many factors causing it and the pain can seriously affect work and daily life. The common medical treatment does not produce good enough results. Recently, clinical application of minimal invasive arthroscopic surgery was chosen because it was considered as a minor surgery with lower risks as compared to conventional methods. The minimal invasive arthroscopic surgery would only be performed by experienced surgeons. Firstly, sterilization was carried out on the fracture site before it was secured with 2 cannulated lag screws. This was done by the arthroscopy method. Research showed that after 12 months, the Observation Group scored 85.62 ± 9.23 on Lysholm scoring whereby the Comparison Group achieved 63.28 ± 9.24 , which were significantly different. On the other hand, in the Oswestry Pain Score, the Observation Group scored 15.29 ± 2.45 while the Comparison Group scored 27.36 ± 2.84 twelve months post operation, which were significant differences, too.

Conclusion

From the study above, minimal invasive arthroscopic surgery on patella knee can aid patient in rapid recovery after surgery and greatly reduce the pain after the surgery which may affect the quality of patient's life. The clinical application as such has proven beneficial to patients.

Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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