

Clinical application of minimal invasive arthroscope on patella fracture surgery

Jiang Bo, Liao Lele

Department of Orthopaedics, the Second Xiangya Hospital, Changsha, Hunan Province, China

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 'Comparison Group' was treated using traditional open surgery whereas the 'Observation Group' used the arthroscopic surgery. The postsurgical score by both groups showed that there are statistical significance differences in Lysholm Knee Pain Scale ($P < 0.05$) and Oswestry Low Back Pain Scale ($P < 0.05$). By performing arthroscopic surgery on patella fractures, the patients' recovery capabilities enhanced while the pain was greatly reduced, which in turn, has improved the quality of patients' life and provide valuable clinical value.

Keywords: Arthroscope; Patella fracture; Pain scoring

Introduction

Clinical signs of patella fracture is 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 have significant result. This research is to probe the clinical application of minimal invasive arthroscope on patella fracture surgery by choosing 100 patients from two hospitals. The result is as below.

Materials and methods

General description

A total of 100 patients from our hospital and the Second Xiangya Hospital's Orthopaedic Ward, who admitted from March 2015 to March 2016, were recruited and divided randomly into 2 groups; Observation and Comparison Group. All patients have given their consent to the doctor to participate in this study. Observation Group comprised of 50 patients, with 30 male and 20 female ranging from 24 to 78 years old, averaging 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.

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doi: [10.18686/aem.v5i2.71](https://doi.org/10.18686/aem.v5i2.71)

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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 set to be non-statistical significance ($P > 0.05$).

Sample grouping

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

Procedural treatment

Firstly, hemostasis on thigh was prevented and 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 by orthopaedic surgeon to secure the fracture site, besides using 2 cannulated lag screws to reposition it. The first screw inserted perpendicular from patella fracture site, with 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 pain post operation 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 lesser pain was experienced by the patients.

Statistical analysis

Data processing was performed on SPSS 17.0 Statistic Software. The data were expressed as mean \pm standard deviation ($\pm s$) with $P < 0.05$ indicates 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	n	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 at the 12th months of the post 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 caused can seriously affect work and daily life of the patients. The common medical treatment does not produce good results. Recently, clinical application of minimal invasive arthroscopic surgery was chosen because it is considered as minor surgery and reduces risks as compared to conventional methods. The minimal invasive arthroscopic surgery would only be performed by well experienced surgeons. Firstly, sterilization is carried out on the fracture site before it is secured with 2 cannulated lag screws, and all this is done using arthroscopy method. The research has shown that after 12 months, the Observation Group scored 85.62 ± 9.23 points on Lysholm scoring whereby the Comparison Group achieved 63.28 ± 9.24 points. This shows that the difference is obvious. On the other hand, for Oswestry Pain Score, the Observation Group recorded 15.29 ± 2.45 points while the Comparison Group notched 27.36 ± 2.84 points twelve months post operation, in which, the contrast is obvious.

Conclusion

From the study above, minimal invasive arthroscopic surgery on patella knee can aid patient in speedy recovery after surgery and greatly reduce the pain suffered 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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