Comparison of Management of Multiple Knee Ligaments Injury: A Clinical Study

Vaibhav Agrawal

ABSTRACT

Background: Multiple ligament knee injuries (MLKI) are usually the result of knee dislocations following either high energy motor vehicle accidents or low velocity sport injuries. Hence, we planned the present study to assess and compare two different management protocols for treating patients with multiple knee ligament injuries.

Methods: The present study involved comparison of two different methods of management of multiple knee ligament injuries. A total of 20 patients with multiple ligament injured knee were included in the present study. All the patients were broadly divided into two study groups as follows: Group 1: Included patients who were treated with one-stage process i.e. all ruptured ligaments were repaired or reconstructed at a single stage of operation. Group 2: Included patients who were treated with staged processes i.e. the entire surgical procedure was carried out in multiple stages Complete follow-up details of all the subjects were obtained. Knee injury and osteoarthritis outcome score during follow-up was used for assessment of results.

Results: Mean age of the subjects of group 1 and group 2 was 39.5 years and 36.4 years respectively. While comparing the sports and knee symptoms of the knee injury and osteoarthritis outcome score during follow-up, significant results were obtained.

Conclusion: Surgical treatment protocol is reliable mode of treatment for treating multiple ligament injury patients.

Key words: Injury, Ligament, Treatment

INTRODUCTION

Multiple ligament knee injuries (MLKI) are usually the result of knee dislocations following either high energy motor vehicle accidents or low velocity sport injuries. Significant morbidity is associated with knee dislocation including multiple ligament disruption and neurovascular damage. The treatment of the MLKI can be very involved. Therefore, the possibility of complications is extremely high. Complication rates are much higher than with standard single-ligament knee injuries.[1-3] Numerous surgical protocols have been proposed for the treatment of these unusual injuries. In recent years, surgery of the major ligaments of the knee has evolved toward an anatomically oriented reconstruction.[4,5] However, with evolving surgical techniques, additional problems developed, including tunnel convergence, either on the lateral or medial side of the knee, involving cruciate and collateral ligament reconstructions. Furthermore, with revision rates of multiligament injured knees nearing 9%, the importance of bone stock preservation for potential future surgeries cannot be overstated.[6-8] Hence; we planned the present study to assess and compare two different management protocols for treating patients with multiple knee ligament injuries.

Source of Support: Nil, Conflict of Interest: None
METHODS
The present study was conducted in the department of Orthopaedics, Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India. It involved comparison of two different methods of management of multiple knee ligament injuries. Written consent was obtained from all the subjects after explaining in detail the entire research protocol. A total of 20 patients with multiple ligament injured knee were included in the present study. All the patients were broadly divided into two study groups as follows:
Group 1: Included patients who were treated with one-stage process i.e. all ruptured ligaments were repaired or reconstructed at a single stage of operation.
Group 2: Included patients who were treated with staged processes i.e. the entire surgical procedure was carried out in multiple stages.
Complete follow-up details of all the subjects were obtained. Knee injury and osteoarthritis outcome score during follow-up was used for assessment of results.9 All the results were compiled and analysed by SPSS software. Chi-square test was used for assessment of level of significance.

RESULTS
A total of 20 patients with multiple knee ligament injury were included in the present study. Among these 20 subjects, 13 were males while the remaining 7 were females. All the patients were broadly divided into two study groups; group 1 and group 2. Mean age of the subjects of group 1 and group 2 was 39.5 years and 36.4 years respectively. While comparing the sports and knee symptoms of the knee injury and osteoarthritis outcome score during follow-up, significant results were obtained.

Table 1. Details of the subjects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>39.5</td>
<td>36.4</td>
</tr>
<tr>
<td>Males</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Females</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2. Comparison of Knee injury and osteoarthritis outcome score during follow-up

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group 1</th>
<th>Group 2</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>93.6</td>
<td>95.1</td>
<td>0.25</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td>89.6</td>
<td>85.4</td>
<td>0.15</td>
</tr>
<tr>
<td>Sports</td>
<td>90.1</td>
<td>85.7</td>
<td>0.01*</td>
</tr>
<tr>
<td>Knee symptoms</td>
<td>90.7</td>
<td>86.9</td>
<td>0.02*</td>
</tr>
<tr>
<td>Quality of life</td>
<td>87.6</td>
<td>84.4</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Table 2*: Significant

DISCUSSION
In the present study, mean age of the subjects of group 1 and group 2 was 39.5 years and 36.4 years respectively. While comparing the sports and knee symptoms of the knee injury and osteoarthritis outcome score during follow-up, significant results were obtained. Sun L et al presented the clinical outcome of 3 surgical strategies based on personalized treatment. Thirty two patients with multiple ligament injured knee were treated by 3 surgical strategies in the acute phase.
(1) One-stage: Twelve patients treated by repair and reconstruction of all ruptured ligaments in a single operation.
(2) Staged: Eleven patients treated by repair or reconstruction of the extraarticular (EA) ligaments and then intraarticular ligaments in 2nd stage. (3) EA ligament repair: Nine patients underwent only EA ligaments repair. The patients were followed up for an average of 34.7 ± 12.1 months. Significant improvements in knee stabilities (P < 0.01), Lysholm score (P < 0.01) and International Knee Documentation Committee grade (P < 0.01) were noticed in all groups. Of the 32 patients, none had gross mal alignment or gait abnormalities at the latest follow up. Comparing the 3 groups, a significant difference in Lysholm score was shown between the one stage group and the EA repair group (P = 0.040); additionally, significant differences were found in 2 subscales of knee injury and osteoarthritis outcome score (P < 0.05). Satisfactory clinical and functional outcomes could be achieved adopting the 3 surgical strategies based on personalized treatment. However, a combination of EA repair and intraarticular repair or reconstruction might be more reasonable options for the young and active patients.9
Lai Z et al evaluated clinical outcomes of anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) reconstruction under arthroscopy combined with limited open repair of medial collateral ligament (MCL) for the treatment of multiple ligament injuries of knee joints. All the patients were performed with X-ray and MRI examination, and the results showed that 10 patients had combined with injuries of anterior cruciate ligament (ACL), posterior cruciate ligament (PCL) and medial collateral ligament (MCL); 4 patients had ALC,PCL and posterolateral corner (PLC) injuries. Four patients had medial meniscus injuries and 2 patients had lateral meniscus injuries. The MCL,PLC and meniscus injuries were treated with operation on the first stage, and functional exercises were performed 3 weeks after fixation. The reconstruction operation of ACL and (or) PCL was performed at the second stage under arthroscopy 3 to 6 months later when the movement range of knee joint recovered to the normal level with obvious relaxation. All incisions healed by primary intention. All the patients were followed up with a mean duration of 48.9 months (ranged, 24 to 80 months). The Lysholm score was improved from preoperative 19.6 +/- 0.9 to the latest follow-up 87.1 +/- 2.8 (t=12.3, P<0.01). The International Knee Documentation Committee (IKDC) rating: 9 cases nearly recovered to normal, 5 cases were abnormal. For multiple ligament injuries in the knee, staged repair and reconstruction can effectively restore knee joint stability and function.10 Subbiah M et al reviewed treatment outcome of our staged protocol for multiple ligament injuries of the knee. 21 men who were treated for multiple ligament injuries of the knee and had completed at least one year of rehabilitation were evaluated. Patients were examined under anaesthesia and then by diagnostic arthroscopy. Arthroscopic reconstructive procedures for injured cruciate ligaments were performed.
after a minimum 110° flexion and full extension were regained. Collateral ligaments injuries were treated first, followed by posterior cruciate ligament (PCL) and then anterior cruciate ligament (ACL) tears. Outcome was evaluated using the Lysholm knee score and International Knee Documentation Committee (IKDC) knee ligament evaluation form. 19 patients aged 24 to 55 (mean, 36) years were followed up for a mean of 22 (range, 14-33) months. The mean Lysholm score was 92. The mean scores for patients treated within and after 3 weeks were 93 and 90, respectively. The overall IKDC grading was B in 15 knees and C and D each in 2 knees. For the 2 patients with grade D, one presented 19 months after the injury and had persistent posterior sag (secondary to capsular contracture). His Lysholm score was 82. The second patient developed a deep infection and endured a flexion loss of 30° but had a satisfactory Lysholm score of 94. There was no significant difference between early and delayed treatments and between low- and high-velocity injuries in terms of the Lysholm score, the IKDC grade, the range of movement, and the functional outcome. Staged management of multiple ligament injuries of the knee enabled satisfactory restoration of function, stability, and range of movement in most of our patients.\[11\]

CONCLUSION

Under the light of above mentioned results, the authors concluded that surgical treatment protocol is reliable mode of treatment for treating multiple ligament injury patients. However, further studies are recommended.

REFERENCES