Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com

doi:10.21276/jamdsr

Index Copernicus value [ICV] =82.06

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Comparison of one staged surgery and two staged surgery in multiple ligament knee injury

Nikhil Kumar

Assistant Professor, Department of Orthopaedics, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

ABSTRACT:

Background: Multiple ligament injuries (MLIs) refer to the damage or tears of two or more ligaments in a joint. The present study compared one staged surgery and two staged surgery techniques in the management of multiple ligament knee injury. **Materials & Methods:** 40 patients of multiple ligament knee injury of both genderswere divided into groups of 20 each. In group I, one staged surgery and in group II, two staged surgery was performed. Parameters such as lysholm score, international knee documentation committee, knee injury and osteoarthritis outcome score were recorded. **Results:** The mean pre- Lysholm scorein group I was 1.8 and in group II was 1.4. Post- Lysholm score was 92.3 and 84.2. Pre- IKDC was 20 in each group and post- IKDC A was seen in 8 and 3, B in10 and 13 and 11 and C in 2 and 4. The difference was non-significant (P> 0.05). The mean pain was 96.4 and 98.4, activity of daily living was 92.4 and 88.6, sports was 91.4 and 86.2, knee symptoms was 91.1 and 87.3 and quality of life was 90.5 and 87.3 in group I and II respectively. The difference was non-significant (P> 0.05). **Conclusion:** Both techniques used to treat knee ligament damage produced improved clinical and functional results.

Key words: Knee ligament, Osteoarthritis, Multiple ligament injuries

Received: 14-10-2019

Accepted: 16-11-2019

Corresponding author: Nikhil Kumar, Assistant Professor, Department of Orthopaedics, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

This article may be cited as: Kumar N. Comparison of one staged surgery and two staged surgery in multiple ligament knee injury. J Adv Med Dent Scie Res 2019;7(12):324-327.

INTRODUCTION

Multiple ligament injuries (MLIs) refer to the damage or tears of two or more ligaments in a joint. Ligaments are tough, fibrous bands of tissue that connect bone to bone and provide stability to the joints.1 When multiple ligaments are injured in a single joint, it can lead to significant instability, pain, and functional limitations. Common joints where multiple ligament injuries can occur include the knee, elbow, and ankle.² These are rare but potentially disabling traumatic events that involve at least two of the 4 major ligaments of the knee (anterior cruciate ligament cruciate [ACL], posterior ligament [PCL], posteromedial corner [PMC] including the medial collateral ligament [MCL], and posterolateral corner [PLC] including the lateral collateral ligament [LCL]).³ The degree of ligament, other soft-tissue, and neurovascular injury occurs across a spectrum in patients with a traumatic knee dislocation of the knee, and management of such complex injuries requires a systematic approach.⁴

A variety of surgical procedures have been suggested to address injuries to the knee. Recent advances in knee surgery have led to anatomically orientated reconstructions for the major ligaments. But as surgical methods advanced, new issues arose, such as tunnel convergence involving reconstructions of the collateral and cruciate ligaments on the medial or lateral side of the knee.⁵Surgical strategies could be divided into 3 major categories first in which all injured structures were repaired or reconstructed in a single stage of operation (the one-stage), second involved ligaments were repaired or reconstructed, respectively, in two stages of surgery (the staged) and in third only extraarticular (EA) ligaments were repaired or reconstructed (the EA).⁶ The present study compared one staged surgery and two staged surgery techniques in management of multiple ligament knee injury.

MATERIALS & METHODS

The present study consisted of 40 patients of multiple ligament knee injury of both genders. All were informed regarding the study and their written consent was obtained

Data such as name, age, gender, etc, was recorded. They were divided into groups of 20 each. In group I, one staged surgery, in group II, two staged surgery

RESULTS

Table I Patient characteristics

Parameters	Variables	Group I	Group II	P value
Lysholm score	Pre	1.8	1.4	0.84
	Post	92.3	84.2	0.71
IKDC	Pre	20	20	0.97
	Post A	8	3	
	В	10	13	
	С	2	4	

Table I shows that the mean pre- Lysholm scorein group Iwas 1.8 and in group II was 1.4. Post- Lysholm score was 92.3 and 84.2. Pre- IKDC was 20 in each group and post- IKDC Awas seen in 8 and 3, B in10 and 13 and 11 and C in 2 and 4. The difference was non- significant (P> 0.05).

Table II Evaluation of KOOS

Characteristics	Group I	Group II	P value
Pain	96.2	98.4	0.94
Activity of daily living	92.4	88.6	0.64
Sports	91.4	86.2	0.91
Knee symptoms	91.1	87.3	0.92
Quality of life	90.5	87.3	0.90

Table II, graph I shows that mean pain was 96.4 and 98.4, activity of daily living was 92.4 and 88.6, sports was 91.4 and 86.2, knee symptoms was 91.1 and 87.3 and quality of life was 90.5 and 87.3 in group I and II respectively. The difference was non-significant (P > 0.05).



Graph I Evaluation of KOOS

DISCUSSION

The ligaments injured vary greatly from one patient to another due to discrepancy in the magnitude of trauma, direction of the violent forces and position of the affected limb at the time of injury. Additionally, each patient who suffers from multiple ligament

was performed. ACL, PCL, PMC, or PLC and posterior capsule were repaired or reconstructed in patients. Parameters such as lysholm score, international knee documentation committee, knee injury and osteoarthritis outcome score were recorded. Data thus obtained were statistically analysed with p value less than 0.05 considered significant. injured knee has his character, including socioeconomic state and general health condition, associated with the distinctive requirement of lower extremity function for daily activity.⁷

One of the most serious injuries from acute trauma is a dislocated knee. It causes severe functional instability and damages at least three of the knee's four primary ligaments. Caring for this injury might be difficult due to accompanying fractures and damage to the veins and nerves. Immobilization was the main form of treatment in the past. However, the management of combined anterior and posterior cruciate ligament (ACL/PCL) tears coupled with disruption of the medial or lateral collateral ligament (MCL/LCL) has shifted to being predominantly surgical due to advancements in surgical instruments and technique.⁸

Patients who have experienced a severe knee dislocation can have varying degrees of ligament, soft-tissue, and neurovascular injury. Managing these complicated injuries calls for a methodical approach. Expert opinion on how to manage multiple-ligament knee injuries seems divided, despite the fact that these injuries have gained more recognition in recent years. All torn ligaments must be repaired and rebuilt in a single session of surgery, which is difficult and timeconsuming.⁹ The precise placement of the reconstructed ligament's insertions, the restoration of the normal femorotibial alignment, the appropriate stress on the reconstructed ligament, and the dependable anchoring of the grafts are the main components of the surgical approaches. Several authors recommended that ACL/PCL should be firstly tensioned at 70-90° of knee flexion under fluorographic monitoring for maintaining femorotibial alignment, followed by the tautness of EA ligament at 30° of knee flexion.^{10,11}The present study compared one staged surgery and two staged surgery techniques in management of multiple ligament knee injury.

We found that the mean pre- Lysholm score in group I was 1.8 and in group II was 1.4. Post- Lysholm score was 92.3 and 84.2. Pre- IKDC was 20 in each group and post- IKDC A was seen in 8 and 3, B in10 and 13 and 11 and C in 2 and 4. Mariani et al¹²evaluated 15 consecutive patients who underwent simultaneous isolated, arthroscopically assisted anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) reconstruction.A bone-patellar tendon-bone autograft was used as the PCL substitute and doubled hamstring tendons were used as the ACL graft. The IKDC evaluation form and the HSS, Lysholm, and Tegner clinical rating scales were used to make clinical evaluations. Anteroposterior translation was measured with the KT-2000 arthrometer and stress view radiography.At final IKDC evaluation, 3 patients (20%) were graded A, 7 (46.7%) were graded B, 3 (20%) were graded C, and 1 patient (6.7%) was graded D. One patient underwent revision surgery in another hospital for severe postoperative residual laxity. Two C-graded patients had an unsatisfactory

outcome as a result of serious complications related to knee injuries. All patients with a grade A or B returned to sports activity. At stress view examination, mean posterior side-to-side translation measured at the lateral tibial plateau was 5.8 +/- 1.1 mm and the mean translation at the medial tibial plateau was 7.3 +/- 1.5 mm; the mean anterior dislocation was 3.3 +/-0.4 mm. The preoperative HSS score rated an average of 32 +/- 9. Postoperatively, the average score reached was 89.6 ± 8.3 . The preoperative Lysholm score was 65.5 ± 9.1 (range, 48 to 78) in patients with chronic lesions and at follow-up was 95.1 +/- 4.5 (range, 88 to 100). The average Tegner activity score decreased in patients with chronic lesions from 6.9 +/- 1.7 (range, 4 to 9) before injury to 5.5 \pm 1.6 (range, 2 to 9) at follow-up. At follow-up, 7 patients (50%) returned to their preinjury level after surgery.

We observed that the mean pain was 96.4 and 98.4, activity of daily living was 92.4 and 88.6, sports was 91.4 and 86.2, knee symptoms was 91.1 and 87.3 and quality of life was 90.5 and 87.3 in group I and II respectively. Strobel et al¹³ found that the mean time from injury to the reconstructive procedure was $70.2 \pm$ 96.7 months. At final IKDC evaluation, 4 patients (29.4%) were graded level B (nearly normal), 10 patients (58.8%) level C (abnormal), and 2 patients (11.8%) level D (grossly abnormal). The mean postoperative subjective IKDC score was 71.8 ± 19.3 points. Mean posterior tibial displacement as measured through stress radiography at 90° of knee flexion was reduced from -15.06 ± 4.68 mm preoperatively to -7.12 ± 3.37 mm postoperatively. The mean anterior tibial displacement was 0.94 ± 2.75 mm preoperatively compared with -1.59 ± 3.50 mm postoperatively. Three patients had a fixed posterior tibial subluxation (posterior tibial displacement ≤ -3 mm on anterior stress radiographs) postoperatively. Severe subjective instability was reduced significantly by the operative procedure. The mean postoperative total anterior-posterior side-to-side difference with the KT-1000 arthrometer testing was 2.00 ± 2.23 mm (range, -4 to 7 mm).

CONCLUSION

Authors found that both techniques used to treat knee ligament damage produced improved clinical and functional results.

REFERENCES

- 1. Angelini F.J., Helito C.P., Tozi M.R. Combined reconstruction of the anterior cruciate ligament and posterolateral corner with a single femoral tunnel. Arthrosc Tech. 2013;2:285–288.
- 2. Chuang TY, Ho WP, Hsieh PH, Yu SW, Chen YJ, Chen CH. One-stage posterior cruciate ligament inlay reconstruction combining anterior cruciate ligament reconstruction following knee dislocation. Arthroscopy. 2006;22:339:1–7.
- 3. Lo YP, Hsu KY, Chen LH, Wang CJ, Yeh WL, Chan YS, et al. Simultaneous arthroscopic reconstruction of the anterior and posterior cruciate ligament using

hamstring and quadriceps tendon autografts. J Trauma. 2009;66:780–8.

- Fanelli GC, Edson CJ. Arthroscopically assisted combined anterior and posterior cruciate ligament reconstruction in the multiple ligament injured knee: 2to 10-year followup. Arthroscopy. 2002;18:703–14.
- 5. Fanelli G.C. Surgical treatment of lateral posterolateral instability of the knee using biceps tendon procedures. Sports Med Arthrosc. 2006;14:37–43.
- Stannard J.P., Brown S.L., Farris R.C., McGwin G., Jr., Volgas D.A. The posterolateral corner of the knee: repair versus reconstruction. Am J Sports Med. 2005;33:881–888.
- LaPrade R.F., Johansen S., Wentorf F.A., Engebretsen L., Esterberg J.L., Tso A. An analysis of an anatomical posterolateral knee reconstruction: an in vitro biomechanical study and development of a surgical technique. Am J Sports Med. 2004;32:1405–1414.
- Zhao J, He Y, Wang J. Simultaneous arthroscopic reconstruction of the anterior and posterior cruciate ligaments with autogenous hamstring tendons. Arthroscopy. 2006;22:497–504.

- Hayashi R, Kitamura N, Kondo E, Anaguchi Y, Tohyama H, Yasuda K. Simultaneous anterior and posterior cruciate ligament reconstruction in chronic knee instabilities: Surgical concepts and clinical outcome. Knee Surg Sports TraumatolArthrosc. 2008;16:763–9.
- LaPrade RF, Wozniczka JK, Stellmaker MP, Wijdicks CA. Analysis of the static function of the popliteus tendon and evaluation of an anatomic reconstruction: The "fifth ligament" of the knee. Am J Sports Med. 2010;38:543–9.
- Ibrahim SA, Ahmad FH, Salah M, Al Misfer AR, Ghaffer SA, Khirat S. Surgical management of traumatic knee dislocation. Arthroscopy. 2008;24:178– 87.
- Mariani PP, Margheritini F, Camillieri G. One-stage arthroscopically assisted anterior and posterior cruciate ligament reconstruction. Arthroscopy. 2001;17:700–7.
- Strobel MJ, Schulz MS, Petersen WJ, Eichhorn HJ. Combined anterior cruciate ligament, posterior cruciate ligament, and posterolateral corner reconstruction with autogenous hamstring grafts in chronic instabilities. Arthroscopy. 2006;22:182–92.