
Original Article

Analysis of the Functional outcome of patients with recurrent dislocation patella treated with arthroscopic lateral retinacular release: A prospective study

Siva Kesavulu Achanala¹, Venu Madhav Bodla^{2*}

^{1 & 2} Assistant Professor, Department of Orthopedics, Malla Reddy Medical College for Women, Suraram, Hyderabad, Telangana, India

*Corresponding Author

Received: 01-02-2018

Email: venumadhav.ortho@gmail.com

Accepted: 17-04-2018

Abstract:

Background: Recurrent dislocation patella is a disorder with a complex etiology and can be a disabling condition. Management of patients with this condition has improved owing to our increased knowledge of the functional anatomy of the patello femoral joint. The treatment goal is to find the most accurate, least invasive method, and this involves sorting through the many structural and functional factors leading to extensor mechanism mal alignment and dysfunction.

Objective: It is a prospective study analyzing of the Functional outcome of patients with recurrent dislocation patella treated with arthroscopic lateral retinacular release.

Methods: A prospective study was conducted in patients undergoing arthroscopic lateral retinacular release for recurrent dislocation patella between 11/2015 and 10/2016 at Malla Reddy Narayana hospital, Suraram X roads, Hyderabad. 27 patients were operated, by a single surgeon & 24 patients were available for study. All patients were followed up for a period of 1 year post lateral retinacular release by a single observer using the subjective knee evaluation part of International knee Documentation Committee (IKDC) Form and Tegner Activity Scale.

Results: There was significant improvement in functional outcome in patients. 7 knees (27%) were rated subjectively as excellent, 15 knees (57.7%) as good, 3 knees (11.5%) as fair, and 01(3.8%) as poor.

Conclusion: Lateral retinacular release can give a significant improvement in functional outcome in patients with recurrent dislocation patella provided the patient selection is good, and the technique is meticulously followed. The limitation of the study is the small number of patients and short term follow up.

Keywords: recurrent dislocation, lateral release, hook knife, arthroscopy

Introduction:

In patellofemoral disorders, two main problems are pain and instability of the knee. Recurrent dislocation patella is a disorder with a complex etiology and can be a disabling condition. Patellar stability relies on the limb alignment, the osseous architecture of the patella and the trochlea, the integrity of the soft-tissue constraints, and the interplay of the surrounding muscles.¹

The treatment goal is to find the most accurate, least invasive method, and this involves sorting through the many structural and functional factors leading to extensor mechanism mal alignment and dysfunction. One of the questions is the role of a lateral retinacular release in the treatment of chronic patella femoral instability.²

This procedure performed open, mini open or arthroscopically has been proposed as an isolated procedure or in combination with proximal or distal realignment procedures of the patella. The arthroscopy affords the surgeon not only a method of inspection and confirmation of a suspected diagnosis, but also a minimally invasive way to treat the problem. It is less traumatic and provides an excellent opportunity to visualize the joint, the status of patella, and removal of any loose bodies and concomitant correction of any other intra articular problems. Arthroscopic lateral release always leaves behind an opportunity after an open surgery in future in case there is recurrence.³

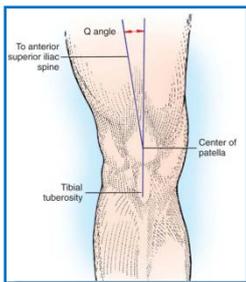
The aim of study is to evaluate the short-term functional results of recurrent dislocations patella treated by arthroscopic lateral retinacular release, with a minimum follow up of 1 year.

METHODS:

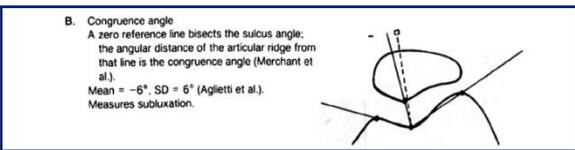
A prospective study was conducted in patients undergoing arthroscopic lateral retinacular release for recurrent dislocation patella between 11/2016 and 10/2017 at Malla Reddy Narayana hospital, Suraram X roads, Hyderabad. 27 patients were operated, by a single surgeon & 24 patients were available for study.

The success or otherwise of these procedure was assessed by direct questioning and clinical (Q angle), radiological examination (congruence angle and lateral patella femoral angle) over a period of not less than 1 yr.

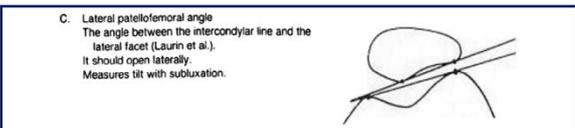
Q angle: this angle is represented by the intersection of a line drawn from the anterior superior iliac spine to the center of the patella with a second line drawn from the center of the tibial tuberosity to the center of the patella. For this measurement to be accurate, the patella must be centered on the trochlea by flexing the knee 30 degrees. In males, the Q angle normally should be 8 to 10 degrees; in females, the normal angle is 15±5 degrees. ¹ This valgus angle gives a lateral force vector to the patellofemoral joint as the knee is extended.



The congruence angle: This reflects the relationship of the patellar articular ridge to the intercondylar sulcus and averages approximately 6±11° in the medial direction. ² More than + 16 degrees is considered abnormal.



The lateral patellofemoral angle: A line drawn along the lateral patellar facet should diverge laterally from a line drawn between the femoral condyles. ³ Parallel and converging lines indicate that patellar tilting or subluxation may be present.



All patients were assessed preoperatively, intra operatively and followed up for a minimum period of 1 year post lateral retinacular release by a single observer using the subjective

knee evaluation part of International knee Documentation Committee (IKDC) Form and Tegner Activity Scale.

Inclusion criteria:

1. Recurrent dislocation patella with a minimum of two episodes of dislocation
2. Absence of associated injury to the medial or lateral collateral ligament.
3. No concomitant insufficiency of the anterior and posterior cruciate ligament.
3. No previous intra or extra articular ligament reconstruction of the knee.
4. No significant osteoarthritic changes in radiograph
5. No obvious patellar deformity (e.g. patella Alta)
6. No generalized ligament laxity
7. No neurological disorder
8. No genu varum or recurvatum

Dislocatable patella



Dislocated patella



Surgical Technique:

Arthroscope inserted through either the superolateral or anteromedial portal. Hook knife inserted through anterolateral portal. Under arthroscopic guidance synovium and lateral retinaculum divided from the superolateral corner of the patella marked by the spinal needle to the inferior extent of the lateral border of the patellar tendon. Occasionally the hook knife placed in a superomedial or superolateral portal to complete the most inferior portion of the release. The release extended proximally along the lateral border of the vastus lateralis tendon. To prevent adhesion of the incised edges of the retinaculum, the edges were shaved with a shaver.

Hook knife



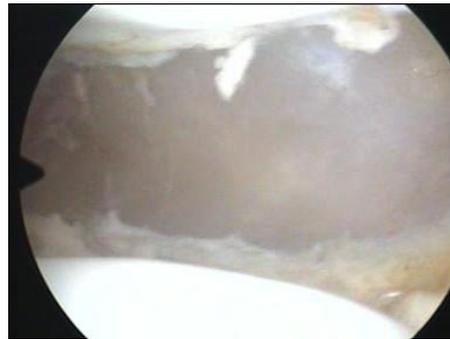
Arthroscopic lateral retinacular release



Tight lateral retinaculum



Retinaculum after release



Post operative rehabilitation:

Quadriceps-setting exercises were begun immediately, range-of-motion exercises were started after 48 hours using Continuous passive motion machine. When the patient was able to flex the knee to 120 degrees and to perform straight-leg raising, quadriceps exercises against resistance were begun. The patient was allowed to return to recreational activities when the strength to be 80 per cent of that of the contra lateral quadriceps. The use of a patellar restraining brace for six months was encouraged. Special attention was given for the stability of the VMO by physiotherapy / electrical stimulation

RESULTS:

Of the 27 patients operated one patient was excluded from the study because concomitant ACL injury was detected intra operatively and 2 were lost in follow up. The remaining 24 patients were assessed. (2 patients had bilateral involvement, total 26 knees). All patients were between the age of 15 and 39 years at the time of surgery (The mean age was 24.8 years). There were 75% females (18 patients) and 25% males (6 patients) in the study, ratio is 3:1. There were 16 (61.54%) Right and Left knees 10 (33.46%).

IKDC score were obtained by the subjective knee evaluation form. Over all pre operative IKDC score was 42.2 (range 27-56). At final follow up it was improved to a score of 78.15. Final IKDC scores were better in males when compared to females. But the pre operative score was also high males when compared to females.

Table 1: IKDC Scores

IKDC Scores	Males	Females
Pre operative	45.83	41.25
Final	86.83	75.55

Out of 26 knees four had loose bodies, two had medial meniscal tear and one had lateral meniscal tear. Overall, there was a statistically significant improvement in Tegner score

from 3.7 ± 1.8 before surgery to 6.8 ± 2.0 after surgery ($P < 0.001$).

Table 2: Preoperative and postoperative Q angle

Pre operative Q angle	Post operative Q angle
18 degree	12 degrees

The Q angles for the twenty six knees in the patients in our series averaged 18 degrees pre operatively, improved to 12 degrees post operatively

Table 3: Change in the congruence angle and lateral patella femoral angle

Radiography	Normal	Before surgery	After surgery
Congruence angle	-8 ± 6 degrees	+9.77 degrees	-9.11 degrees
Lateral patella femoral angle	> 0 degrees	-2 degrees	3.6 degrees

Preoperatively, the average congruence angle, which was affected by the operation was $+9.77^\circ$ improved to -9.11° after surgery ($P < .001$). The change between the preoperative and the postoperative congruence angle averaged 9.11 degrees in the medial direction for all twenty-six knees. When the clinical grading of the results was correlated with the average change in the congruence angle that resulted from the operation, it was found that the patients who had an excellent or a good result had more change in the congruence angle

Table 4: Sex wise results of the interventions

Sex	Excellent	Good	Fair	Poor	Total
Male	02	04	00	00	06
Female	05	11	03	01	20
Total	07 (27%)	15 (57%)	03 (11.5%)	01 (3.8%)	26

Significant improvement observed in the lateral patellofemoral angle also from -2° before surgery to 3.6° after surgery ($P < .001$). In the subjective follow up 7 knees

(27%) were rated as excellent, 15 knees (57.7%) as good, 3 knees (11.5%) as fair, and 01(3.8%) as poor. 23 stated that the procedure was worth while

In comparing the sex of the patient with the clinical grade, the male patients had a better result. All male patients are having excellent or good results, but only 80% of female patients are having excellent or good results.

Table 5: Sex wise comparison of results

Sex	Good or excellent	Fair or poor
Male	06 (100%)	00
Female	16 (80%)	04 (20%)

All of the patients who were less than 25 years at the time of operation had an excellent or a good result.

Table 6: Age wise comparison of results

Age (years)	Good or excellent	Fair or poor	Number of knees
15-25	12 (92.3%)	01 (7.7%)	13
> 25	10 (77%)	03 (23%)	13

The only immediate complication encountered was hemarthrosis. This occurred in 2 (7.7%). patients and needed aspiration. There were two recurrent lateral dislocations. One is in the patient who had a history of bilateral dislocation. This patient was treated non operatively with exercises and a patellar restraining brace, and had no further recurrence. Another one was treated with open distal realignment procedure

DISCUSSION:

The indications for release of lateral retinaculum of knee are becoming better delineated. All patients in our series have had episodes of giving way that had limited their activities. Some who had meniscal tears as well had recurrent episodes of “locking”. The inclusion criteria’s were used in an attempt to produce a patient population with obvious patellar dislocation without major associated injuries. We feel that preliminary arthroscopic examination of the affected knee is important as it provides information regarding the state of the articular surfaces of the knee and the presence of any other lesion. Successful clinical outcomes following arthroscopic lateral retinacular release have been reported by many authors (6, 7). Despite these favorable results, concerns regarding the recurrence of dislocation, the effect of rehabilitation, gender difference in outcome remains.

The range of age for the subjects of our study was 15 – 39 years. The mean age was 24.8 years. All of the patients who were younger than 25 years at the time of operation had an excellent or a good result. The younger patients, however, did tend to have less severe chondromalacia, and this may well have improved the prognosis. Younger patients co operated well for the rehabilitation programme.

Earlier reports of recurrent subluxation and dislocation of the patella showed a predominance of female patients.^{4, 5} Recently, however, this distribution has not been confirmed. Insall et al. reported an even sex distribution in patients who had chondromalacia, and Hughston reported a male-to-female ratio of almost three to one (72 per cent male and 28 per cent female patients) in his series of patellar subluxations.

In this study we have female-to-male ratio of three to one (18 females and 6 males). The sex of the patient was a significant prognostic factor, regardless of the clinical diagnosis. The female patients did not do as well postoperatively. We are not certain of a direct causal relationship. but we speculate that factors such as a broader pelvis, more femoral ante version, and genu valgum might result in residual forces in the knee that tend to pull the patella laterally, thus perpetuating the symptoms.^{6, 7} Female patients in general poorly co operated with the post operative rehabilitation, more over the mean IKDC score was more pre operatively in males, which must have reflected in the post operative scores.

In this study we did not find any direct co-relation between number of dislocations and final outcome.

In subjective evaluation one⁸ series had an improvement of mean IKDC score from 52 to 83 at one year follow up. In our study the mean IKDC score was improved from a pre operative value of 42.2 to 78.15 at final follow up. Persistent pain was the main cause for low IKDC score in those patients.

Often the aim of lateral retinacular release would be to alter and improve the Q angle. In this manner, the magnitude of the quadriceps vector would be diminished to prevent lateral displacement of the patella in early flexion, before it engages the trochlea.

After releasing the lateral retinaculum average Q angle decreased from 18 degrees pre operatively to 12 degrees post operatively. This clearly says that the overall extensor alignment has improved from abnormal lateral force vectors.

In the study conducted by Ellis K. Nam and Ronald P. Karzel⁸ by Mini-Open Medial Reefing and Arthroscopic Lateral Release, Radiographically, they had significant improvement in the congruence angle from $15.7^\circ \pm 12.6^\circ$ before surgery to $-11.5^\circ \pm 8.7^\circ$ after surgery and in the lateral patellofemoral angle (normal, $> 0^\circ$) from $-0.2^\circ \pm 6.4^\circ$ before surgery to $7.9^\circ \pm 2.6^\circ$ after surgery, which was consistent with our results of preoperative the average congruence angle, $+9.77^\circ$ improved to -9.11° after surgery and significant improvement in the lateral patellofemoral angle from -2° before surgery to 3.6° after surgery.

The degree of chondromalacia that was present at the index operation did not seem to be a prognostic factor; 81 percent of the knees had a good result, regardless of the extent of chondromalacia. While the degree of chondromalacia did not seem to affect the over-all, according to literature it is interesting to note that all of the knees that needed a reoperation had severe patellofemoral osteoarthritis. The presence of Grade-II & Grade III changes did not always mean that a clinical failure was inevitable, yet a poor outcome was always associated with progression to patellofemoral osteoarthritis.

At the evaluation of arthroscopic lateral patellar facet and lateral femoral condylar chondral pathologies, we observed that patellar chondral pathologies were more severe than the femoral chondral pathologies. In our opinion, the severity of patellar lateral facet chondral lesions, although it has a thicker layer of cartilage, is due to distribution of load to a larger contact area of lateral femoral condyle.

CONCLUSION:

The main goal of lateral retinacular release is to prevent symptoms caused by dislocation of patella. In Our series 84.7% releases have excellent to good results. We conclude that lateral retinacular release can give a significant improvement in functional outcome in patients with recurrent dislocation patella provided the patient selection is good, and the technique is meticulously followed and the patient cooperates for intensive post operative rehabilitation. The limitation of the study is the small number of patients and short term follow-up.

Recommendations:

Younger age group patients are having better results when compared to people in third or fourth decade. Male patients are having good results when compared to female patients. An isolated lateral retinacular release has role in the treatment of recurrent patella instability in patients with Q angle less than 20 degrees. If a patient who has patellar instability and an increased Q angle undergoes isolated lateral release, increased patellar instability symptoms may occur secondary to a dynamic increase in the Q angle. Care has to be taken that the lateral retinaculum is not “over-released” leading to a potentially devastating medial patellar instability.

Closed lateral retinacular release of the patella appears to be a safe and reliable procedure. A very small scar, early mobilization and early return to work make this surgical procedure very attractive to patients who are prepared to have a second-stage operation if this fails

REFERENCES:

1. Kolowich PA, Paulos LE, Rosenberg TD, Farnsworth S. Lateral release of the patella: indications and contraindications. *Am J Sports Med.* 1990 Jul-Aug;18(4):359-65

2. Merchant AC, Mercer RL, Jacobsen RH, Cool CR. Roentgenographic analysis of patellofemoral congruence. *J Bone Joint Surg Am.* 1974;56:1391-6
3. Laurin CA, Dussault R, Levesque HP. The tangential x-ray investigation of the patellofemoral joint: x-ray technique, diagnostic criteria and their interpretation
4. Macnab I. Recurrent Dislocation of the Patella. *J Bone and Joint Surg* 1952;34A(4):957-967
5. Smillie IS. *Diseases of the Knee Joint.* 2nd ed. New York. Churchill Livingstone. 1980. pp. 82-98
6. Nicholas JA. The Five-One Reconstruction for Anteromedial Instability of the Knee. Indications, Technique, and the Results in Fifty-two Patients. *J Bone Joint Surg* 1973;55-A: 899-922
7. Williams PL, Warwick R. *Gray's anatomy of the human body.* 36th ed. Edited by P. L. Williams and Roger Warwick. Philadelphia, W. B. Saunders, 1980. pp. 387-390.
1. Nam EK, Karzel RP. Mini open medial reefing and arthroscopic lateral release for the treatment of recurrent patellar dislocation. A medium-term follow-up. *Am J Sports Med* 2004;33(2):220-30

Source of Support: Nil. **Conflict of Interest:** None.

Cite this article as: Achanala SK, Bodla VM. Analysis of the Functional outcome of patients with recurrent dislocation patella treated with arthroscopic lateral retinacular release: A prospective study. *MRIMS J Health Sciences* 2019;7(1):1-6.