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Functional outcome of Medial patellofemoral ligament injury (MPFL) reconstruction in recurrent patellar dislocation

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Abstract
Introduction: Patella dislocation is defined as interposition of patella out of the trochlear groove. Patella dislocation is typically lateral and most often traumatic. Surgical treatment for patellar dislocation has evolved from the initial medial reefing to the present day anatomical reconstruction of MPFL which is thought to be the most appropriate treatment. MPFL reconstruction has been recommended in adults over the past decade after recurrent patellar instability. Many studies have shown good clinical outcome with this procedure compared to others. This study is undertaken in order to evaluate, clinical results of MPFL reconstruction.
Materials and Methods: This prospective study included 20 cases of recurrent dislocation of patella patients of either sex fitting the inclusion criteria at the Orthopedic Department of Sanjay Gandhi Institute of Trauma and Orthopedics, Bangalore from September 2016 To December 2017**.** Patients admitted with MRI proven mpfl tear after meeting the inclusion and exclusion criteria are selected. They will undergo detailed history, clinical and radiological evaluation. Mpfl repair was done by a single trained surgeon. Post-operative rehabilitation as per standard protocol. Postoperative evaluation done at 1 year. Lysholm and kujala scoring done at preoperative and postoperative follow-ups.
Results: The mean age in our study is 24.4years. Majority are in the age group 15 to 45yrs. Mean kujala score increased from 50.8 to 93.7 which is statistically significant (p<0.005). Lysholm score has increased from 54.05 to 90.65 which is statistically significant (P value <0.005). Preoperatively 17 patients had poor and 3 patients had fair Lysholm score which changed to excellent in 13 patients, good in 5 patients and fair in 2 patients.
Conclusion: MPFL reconstruction using an autologous hamstring graft with suture anchors gave a good preliminary outcomes; it greatly helps in preventing further episodes of patellar subluxations or dislocations and in improving quality of life. Further clinical studies are needed to confirm these early results.

Keywords: Patella, dislocation, medial patella femoral ligament

Introduction
Patella dislocation is defined as interposition of patella out of the trochlear groove. Patella dislocation is typically lateral and most often traumatic. In a primary dislocation the most commonly injured ligament is the medial patellofemoral ligament (MPFL) which is the primary restraint to lateral displacement of patella. About 94% of all primary patellar dislocations result in tear of MPFL which can predispose the patient to recurrent patellar dislocation. Rupture of this structure always occurs in lateral patellar dislocation because the mpfl can undergo a maximum elongation of 20%-30% (range, 18 to 20mm); this is far less than the patellar width, which often exceeds 40mm.Redislocation rate after non operative management of primary patellar dislocation is 15-44%. There have been various surgeries done for the structures around the patella which are thought to influence its stability in an attempt to prevent further dislocations. Consensus has been reached that MPFL is the single most important medial stabilizer that needs to be repaired/reconstructed to prevent further dislocation. Surgical treatment for patellar dislocation has evolved from the initial medial reefing to the present day anatomical reconstruction of MPFL which is thought to be the most appropriate treatment.

MPFL reconstruction has been recommended in adults over the past decade after recurrent patellar instability. Many studies have shown good clinical outcome with this procedure compared to others [1, 2] this study is undertaken in order to evaluate, clinical results of MPFL reconstruction.

Materials and methods

This prospecutive study included 20 cases of recurrent dislocation of patella patients of either sex fitting the inclusion criteria at the Orthopedic Department of Sanjay Gandhi Institute of Trauma and Orthopedics, Bangalore from September 2016 To December 2017**.** Patients included were between 14 to 50 yrs of age with MRI proven mpfl tear with TT-TG INTERVAL <20 MM who underwent mpfl repair and willing to participate in study. Exclusion criteria included other ligament injuries in the same knee, type3 or type 4 trochlear dysplasia/grade 4 damage in Patellofemoral joint, High grade patella alta. Patients who underwent prior procedures for patellar dislocation. Patient with associated long bone fractures of the same limb. Patients admitted with MRI proven mpfl tear after meeting the inclusion and exclusion criteria are selected for the study. They will undergo detailed history, clinical and radiological evaluation. Clinical examination includes range of motion, apprehension sign, patellar quadrant test, patellar Malt racking, patellofemoral crepitus and facet tenderness. With prior informed consent, a pre-operative anesthetic evaluation is done. Mpfl repair was done by a single trained surgeon. Post-operative rehabilitation as per standard protocol. Postoperative evaluation done at 1 year. Lysholm and Kujala scoring done at preoperative and postoperative follow-ups.

Data analysis

The collected data was analyzed statistically using SPSS software version 22 with Paired t tests.

Surgical technique

Semitendinous graft harvested and prepared. Skin incision of 2.5cm is made on the proximal medial border of the patella. A sulcus is prepared on the bony surface of medial border to accomodate the suture anchors and the graft. We fix the central portion of graft using two suture anchors spaced about 1cm apart, so that two free ends are left out. Under fluoroscopic guidance according to Schottle *et al*. a 2 cm incision is made between medial epicondyle and adductor tubercle and a guide wire with eyelet is drilled at femoral insertion point over which a femoral tunnel is made with the help of cannulated drill. The graft is then passed through the second layer of medial parapatellar retinaculum. Suture together the two free ends (35mm length) by Krackow stitches using absorbable sutures. The free ends of the sutures of the graft are put into the eyelet of gudewire and graft is passed through the femoral tunnel medial to lateral. The tensioning of free ends of sutures is done from the lateral side of the knee simultaneously checking for patellar mobility medial to lateral and to assess graft tension all through the ROM of knee. Femoral fixation is then achieved using bio composite interference screw with knee in 60 degrees of flexion.

Rehabilitation

The knee was immobilized in 30° flexion in a rigid long knee brace for 2 weeks with the limb with toe touch weight bearing. Active range of motion and quadriceps toning exercises are started following suture removal (10–14 days).The brace was discarded after 6 weeks or once the patient regains strength and good quadriceps control. to regain full range of motion by 2–3 months postoperatively. Following this foot, ankle, hip and core stabilization exercises were initiated. Balance and proprioception training could be followed by resumption of sports at 4 months.

Results

A Prospective study with 20 patients is undertaken to study the functional outcome of MPFL repair. The mean age in our study is 24.4years. Majority are in the age group 15 to 45yrs. Out of 20 patients, 8 were male, 12 were female. All patients had apprehension sign positive, 16 patients had Maltracking, 18 patients had facet tenderness and 19 patients had patellar quadrant test positive. Postoperatively no patients had apprehension, maltracking, facet tenderness and patellar quadrant test. Mean Kujala score increased from 50.8 to 93.7 which is statistically significant (p<0.005). Lysholm score has increased from 54.05 to 90.65 which is statistically significant (P value <0.005). Preoperatively 17 patients had poor and 3 patients had fair Lysholm score which changed to excellent in 13 patients, good in 5 patients and fair in 2 patients.

Discussion

Medial Patellofemoral Ligament (MPFL) was first described by Kaplan in 1957 as a transverse reinforcement between the base of patella and the tendon of medial head of gastrocnemius [3]. The term MPFL has been described by many authors like Nomura *et al*, Avikainen *et al*, Ahmad *et al* and others and its importance has been accepted both biomechanically and clinically [4-6] The MPFL is the primary soft tissue restraint against lateral patellar displacement [7]. It is significant during early flexion, between 0-30 degrees [8].

It has been experimentally shown that repair or reconstruction of the MPFL restores the normal patellar tracking [7], MPFL injury has been found on MRI or surgical exploration to occur at an extremely high rate after primary traumatic patellar dislocation [9] Therefore, the importance of the MPFL in patellar dislocation has been widely acknowledged. An increasing trend is that knee surgeons focus on the restoration of the MPFL to stabilize the medial patellar restraints, favourably if there are no existing abnormalities such as excessive TT-TG distance, an increased Q- angle or a shallow Trochlear groove.

Various surgical techniques have been described using graft materials like adductor Magnus tendon [10] the quadriceps tendon, [11] semitendinosus tendon [12] and artificial ligament material [5] for reconstruction of MPFL. The adductor Magnus tenodesis technique is described by Avikainen *et al*. [10] which was originally performed in addition to acute MPFL repair. A mini invasive method using adductor Magnus tendon described by Sillaenpaa [13]. Gomes *et al*. [14] used a synthetic material (polyester ligament) which is passed through drilled patellar tunnel and fixed to femur at its medial epicondyle using a screw and lateral end of the artificial graft was fixed with sutures. This technique was later modified using a semitendinosus graft via the Osteoperiosteal tunnel for femoral fixation. We used two suture anchors to fix graft at patellar end and interference screw at femoral end. The mean age in our study is 24 years. Majority are in the age group 15 to 45yrs. Lysholm score has increased from 54.05 to 90.65 which is statistically significant (P value <0.005). Preoperative assessment showed 17 patients had poor and 3 patients had fair Lysholm score which changed to excellent in 13 patients, good in 5 patients and fair in 2 patients. Similar

study conducted by Raghuveer Reddy *et al*. [15] with mean duration of follow up average of 42 months (range 24–60 months) after the operative procedure in which 10 knees showed excellent results, 3 knees gave good results, and 2 knees had a fair result. Mean Kujala score increased from 50.8 to 93.7 which is statistically significant (p<0.005). The average preoperative Kujala functional score was 44.8 and the average postoperative score was 91.9. Ditte Enderlein *et al*. [16] done a study which included 224 patients undergoing MPFL reconstruction in a total of 240 knees between 2008 and 2011. At the 1-year follow-up, a positive apprehension sign was found in 14% of the patients. The postoperative assessment in our study showed no apprehension test positive in any case. The Kujala score improved from 62.5 (17) to 80.4 (18) (p< 0.001) at the 1-year follow-up. The revision rate was 2.8%.None of our patients required revision surgery. Seven patients (4.6%) had a redislocation, and 39% had experienced one or more episodes of subjective patellar instability (subluxation sensation).In our study no patients had redislocation or sensation of subluxation. Nomura and Inoue [17] used a semitendinosus graft for MPFL reconstruction, which was passed through the patellar bone tunnel reaching from the patellar medial margin to the middle anterior surface of the patella. It was attached distal to the adductor tubercle or posterosuperior to the medial epicondyle on the femur. After a mean 4 year follow up, there was no redislocation and 10 of the 12 knees examined were good or excellent. Schöttle *et al*. [18] published a study of 15 knees in which the MPFL reconstruction was performed using an ipsilateral semitendinosus autograft. The patellar attachment was superomedial, and tendon fixation to the bone tunnel was done with an interference screw. Similarly, femoral attachment at the adductor tubercle was achieved with an interference screw. A mean follow up of almost five years reported 13 of 15 patients had good or excellent results. Gomes *et al*. [19] assessed 15 patients (16 knees) treated between 1992 and 1996 (follow up 5 years). According to Crosby-Insall criteria, 11 knees were rated as excellent, 4 good, and 1 poor. Kujala and lysholm scoreing not done in this study. David drez *et al*. [20] did a case series in which Nineteen consecutive patients underwent medial patellofemoral repair or reconstruction in the treatment of patellar instability after patellar dislocation 10 knees had excellent results, 3 knees obtained good results, 1 knee had a fair result, and 1 knee had a poor result, for a total of 93% improvement overall.one patient in our study experienced knee stiffness and was kept on physioyheraphy for long time. 2 patients complained of crepitus in the knee in the follow up which was managed conservatively. None of the patients had infection or instability in the final follow up. The limitations of the study are small sample size, short duration of follow up.

Conclusion

MPFL reconstruction using an autologous hamstring graft with suture anchors gave a good preliminary outcomes; it greatly helps in preventing further episodes of patellar subluxations or dislocations and in improving quality of life. Further clinical studies are needed to confirm these early results.

References

1. Nomura E. Classification of lesions of the medial patella-femoral ligament in patellar dislocation. Int. Orthop. 1999; 23:260-3.
2. Sallay PI, Poggi J, Speer KP, Garrett WE. Acute dislocation of the patella. A correlative pathoanatomic study. Am J Sports Med. 1996; 24:52-60.
3. Kaplan EB. Factors responsible for the stability of the knee joint. Bull Hosp Joint Dis. 1957; 18:51-9.
4. Hautamaa PV, Fithian DC, Kaufman KR, Daniel DM, Pohlmeyer AM. Medial soft tissue Straints in lateral patellar instability and repair. Clin Orthop, 1998, 174-82
5. Nomura E, Horinchi Y, Kihara M. Medial patellofemoral ligament restraint in lateral patellar translation and reconstruction. Knee. 2000; 7:121-127
6. Stefancin JJ, Parker RD. First-time Traumatic Patellar Dislocation: A Systematic Review. Clin Orthop Relat Res. 2007; 455:93-101.
7. Hautamaa PV, Fithian DC, Kaufman KR, Daniel DM, Pohlmeyer AM. Medial soft tissue straints in lateral patellar instability and repair. Clin Orthop, 1998, 174-82
8. Parker DA, Alexander JW, Conditt MA, Uzodinma ON, Bryan WJ. Comparison of isometric and anatomic reconstruction of the medial patellofemoral ligament: a cadaveric study. Orthopedics. 2008; 31:339-43.
9. Spritzer CE, Courneya DL, Burk DL Jr, Garrett WE, Strong JA. Medial retinacular complex injury in acute patellar dislocation: MR findings and surgical implications. AJR Am J Roentgenol. 1997; 168:117-22
10. Avikainen VJ, Nikku RK, Seppänen-Lehmonen TK. Adductor Magnus tenodesis for patellar dislocation. Technique and preliminary results. Clin Orthop, 1993, 12-6.
11. Steensen RN, Dopirak RM, McDonald WG. 3rd The anatomy and isometry of the medial patellofemoral ligament: implications for reconstruction. Am J Sports Med. 2004; 32:1509-13.
12. Drez D Jr, Edwards TB, Williams CS. Results of medial patellofemoral ligament reconstruction in the treatment of patellar dislocation. Arthroscopy. 2001; 17:298-306.
13. Sillanpää PJ, Mäenpää HM, Mattila VM, Visuri T, Pihlajamäki H. A mini-invasive adductor magnus tendon transfer technique for medial patellofemoral ligament reconstruction: a technical note. Knee Surg Sports Traumatol Arthrosc Epub, 2009. DOI: 10.1007/s00167-008-0713-9.
14. Ellera Gomes JL. Medial patellofemoral ligament reconstruction for recurrent dislocation of the patella: a preliminary report. Arthroscopy. 1992; 8:335-40.
15. Raghuveer Reddy K, Chandra Bdr Mishra. Reconstruction of medial patellofemoral ligament for chronic patellar instability Raghuveer Reddy K, Chandra Bdr Mishra 2015, IP: 1.186.28.2]
16. Ditte Enderlein, Torsten Nielsen, Svend Erik Christiansen, Peter Faunø, Martin Lind. Clinical outcome after reconstruction of the medial patellofemoral ligament in patients with recurrent patella instability Knee Surg Sports Traumatol Arthrosc. 2014; 22:2458-2464.
17. Nomura E, Inoue M. Surgical technique and rationale for medial patellofemoral ligament reconstruction for recurrent patellar dislocation. Arthroscopy. 2003; 19:E47
18. Schottle PB, Fucentese SF, Romero JJ. Clinical and radiological outcome of medial patellofemoral ligament reconstruction with a semitendinous autograft for patella instability, 2005.
19. Joa¨o Luiz Ellera Gomes, Luiz Roberto Stigler Marczyk, Paulo Ce´sar de Ce´sar, Carlos Francisco Jungblut. Medial Patellofemoral Ligament Reconstruction With Semitendinosus Autograft for Chronic Patellar Instability:

A Follow-up Study*doi:*10.1016/j.arthro.2003.11.006
20. David Drez, Bradley Edwards T, Claude S Williams. Results of Medial Patellofemoral Ligament Reconstruction in the Treatment of Patellar Dislocation