ECRONICON OPEN ACCESS

ORTHOPAEDICS
Research Article

Anteromedialization in the Treatment of Patellofemoral Instability Associated with a High and Lateralized Patella in Adults

Francisco Alberto Vidal Rodriguez[1]* and Gustavo Rosas Alejandro Sanchez[2]

[1]Department of Joint Service Reconstructive Surgery, Orthopaedic Hospital of the Medical Unit of High Specialty, Mexico

[2]Department of articular reconstructive surgery service, Mexico

***Corresponding Author:** Francisco Alberto Vidal Rodriguez, Department of Joint Service Reconstructive Surgery, Orthopaedic Hospital of the Medical Unit of High Specialty, Mexico.

Received: November 12, 2015; **Published:** November 18, 2015

Abstract

Introduction: A study conducted at our hospital showed that patellofemoral instability associed with a high and lateralized patella occurred in 34 out of 4954 admitted patients (6.86%). In order to treat these alterations we studied a series of patients in whom an Anteromedialization technique was used. Material and Methods: This is a prospective, cross-sectional descriptive cohort study, with probabilistic sampling, conducted between March 1st 2009 and December 1st 2013. Twenty patients who met the inclusion criteria were selected. The same technique was used in all patients, performed by the same surgeon, with the same postoperative and rehabilitation protocol. The modificated Lyshom scale was applied and the results were assessed by two blinded observers whose concordance was assessed with the kappa index. Results: twenty patients was teated, 12 females and 8 males: mean age was 20 years. In 14 patients dislocating even occurred in one of the knees and in 6 it was bilateral; the right side predominated. Dislocation was recurrent in 7 patients y relapsing in 13 with other techniques of realignment. The mean clinical Q angle was 18º preoperatively and 7º postoperatively. The preoperative and postoperative radiographic assessment was equivalent to a Kappa of 88%. Mean healing time of osteotomy was 8 weeks; 2 hemarthorsis occurred in the immediate postoperative period, which were resolved with puncture; no fractures and no graft collapses where reported. The mean Lysholm scale was 90.9 at 6 months (interobserver Kappa of 90%). All patient had quadriceps atrophy of 1-2 cm, one patient had minimal residual pain and by the end of the study none of the patients had had relapsing dislocation. Conclusions: This technique corrects the dislocation resulting from a high and lateralized patella by modifying the Q angle. It involves minimal complications, uses a small 5 cm approach and not requires special guides. This study remains open to long term follow up to detect the presence or absence of patellofemoral arthrosis.

In patellofemoral instability Roux (1888) describedsurgical treatment acting on the distal extensor apparatus, consisting in the medicalization of the anterior tubercle of the tibia and thus drag the patellar tendon and the patella to avoid lateral displacements. (1.3)

The medial translation described by Roux initially, did not vary by an approximate 70 years, and subsequently appeared minor variations thereof, such as Goldthwait (1904), Hauser (1938), Smillie (1951) and Trillat (1964). [1,3,4] . In the early twentieth century, the first reports of techniques appear to avoid excessive external loading of the patella proximally, working mainly on soft tissue, as some myoplasty vastus medialis, as described by Krogius (1904), as later amended by Lecene Soto and Hall (1945). Insall (1979), Grana (1984) and Sojbjerg (1979) [6] . Other interventions used tendon transplants anserine to the patella as Lexer (1931), Mac Carroll and Schwartzman (1945) and Max Lange (1951). This entire techniques uncorrected high patella so osteoarthritis was present.

Fulkerson (1983) [7], describes his technique for treating patella dislocation , which is a modification of the technique Elmslie , Trillat and Maquet , [9] where he made an oblique cut on the anterior tubercle of tibia and get anteromedialization approx. 5mm fixing the slab with 2 screws without using bone graft, and start to treat the femoropatellararthrosis, amending angle "Q". [9].

Sanchis 1995 [8] presents a variation of the Anteromedialization technique modifying anterior tubercle osteotomy in wedge, in the axial plane and moving it over the medial edge of the osteotomy, and maintaining medialization with a proximal screw, the surgical approach is widespread in italic "S" and osteotomy length is about 12 cm, with a high approached.

Nietosvaara., *et al*. In Finland, reported the annual incidence of patellar dislocation in patients under 16 years, from 43 per 100,000. Atkin in 2000, relates an annual risk of 11 per 100,000 for the third decade of life, and for patients between 30 and 59 years of age is 1.5 per 100,000, taking more risk of dislocation females during the second decade of life. [17]

In the department of reconstructive joint surgery of the orthopedic hospital "Dr. Victorio de la Fuente Narváez" of Mexican Institute of Social security in Mexico city. The prevalence of patellofemoral instability in the period 2009-2011 was at 34 per 4,954 patients with rate of 6.86%, and all patients had associated high and lateralized patella. [26,27], we developed a surgical technique that solves these two abnormalities Hypothesis: This technique solves the dislocation caused by high and lateralized patella and with good functional results?

Material and Methods

This is a prospective, cross sectional and descriptive cohort study,with probabilistic sampling, conducted between March 1st 2009 to December 1st 2013 in the department of articular joint surgery at orthopedic hospital "Victorio de la Fuente Narvaez" of Mexican institute of social security in Mexico city.

Calculation of sample size
N = (Zα) 2 (P) (1 -P)/(s 2)
N = (1.96) 2 (.0.015) (1-0.015)/(.05) 2
N = 19.58

where :
Zα = 1.96 constant error limits in 95% of cases
P = population proportion 1.5% (taken from reference) = 0.015
1-p = proportion of those without the disease
s = coefficient of variation 0.05

We select 20 patients, the inclusion criteria were:
1) relapsing dislocation of patella, 2) recurrent dislocation patella ,3) patella high following radiographic criteria of Insall and Salvati, and lateralized ,4) both sexes,5) higher 15 years old with closed physis . Exclusion criteria: 1) Excessive lateral pressure syndrome,2) genu valgus, 3) femoral torsion, 4) lateral condyle hypoplasia, 5) neurological problems (Down,seizures, cerebral palsy). Elimination criteria: study abandonment, death, change of unit.

All patients signed an informed consent, The same technique was used in all patients by the same surgeon, with the following technique, 1) approach 5 cm lateral to the anterior tubercle of the tibia, 2) release the lateral retinaculum subcutaneous 3) take the graft from Gerdy'stubercle, this graft is bicortical and pyramidal 4(losteotomy of the anterior tubercle of the tibia, this osteotomy ishorizontal following the coronal plane, length of 8 cm, thickness of 5 mm, 5) medicalization until "J" sign disappear, one cm approx. 6) put the graft for advancement of the slab 1.5 cm, 7) fixing it with 2 screws (cancellous or cortical), verifying the proper centering of the patella in the femoral trochlea, 8) drain placement, which it is removed to obtain less than 50 cc, 9) padded bandage for 2 weeks until suture removal, 10) the patients can walk with crutches for 8 weeks,11) start the progressive flexion of the knee immediately after surgery, avoid gravity forces.

All patients were applied functional knee scale "Tegner-Lysholm at 6 months after surgery, functional and radiographic results were performed by two blinded observers; kappa statistics were applied to determine the inter-observer correlation. This study complies with the guidelines established in the Helsinki's declaration of, WHO guidelines (equity, beneficence, non-maleficence and justice), and is in compliance with the Mexican institutional regulations. Following the recommendations to guide physicians in biomedical clinical research involving human beings. Adopted From the 18th World Medical Assembly, Helsinki, Finland, 1964 and revised by the 29th World Assembly, Tokyo Japan, 1975 and the 35th World Medical Assembly, Venice, Italy, 1985

Figure 1: *Approach, retinaculum release, bone gra.*

Figure 2: *Horizontal osteotomy, anteromedialization, fixing with 2 screws, radiographic control.*

Results

20 patients, 12 females and 8 males , 3:1 , mean age 20 years, 14 patients in the luxating event occurred in one knee and in 6 patients bilaterally , predominantly the right side were evaluated. Recurrent dislocation type in 7 and recurrent in 13 of the last 12 had soft tissue realignment and release of lateral patellar retinaculum and one overtaking. The Q angle in clinical preoperative average was 18 degrees and 7 postoperatively, 80% kappa Preoperative and postoperative radiographic evaluation Kappa throw of 88% on average osteotomy slow to consolidate nine weeks no slab fractured, nor present graft collapse, Lyshom scale to 6 months on average reported 90.9, kappa interobserver 90%, none of the patients treated with this technique presented recurrent dislocation. Complications occurred in the immediate postoperative hemarthrosis resolved two puncture in all atrophy 1 was presented to 2 cm quadriceps, a patient with residual pain tolerated.

Conclusions

Anteromedialization technique corrects the 2 components of high and lateralized patella. By changing the angle Q proper centering of the patella on the femoral trochlea is performed, overtaking prevents the progression of osteoarthritis as documented [5,28], the difference with the Fulkerson osteotomy is that this is an osteotomy horizontal, with minimal approach without guides or special instruments , with minimal complications and allows support immediately after surgery, with full recovery of range of motion as demonstrated with the implementation of the Lysholm and Tegner scale . Until the end of the study no patient has relapsed. The study is open for long-term monitoring to detect the progression of osteoarthritis or any recurrence.

Discussion

This technique is not recommended in the excessive pressure lateral of the patella syndrome (ELPS), the treatment is the lateral retinaculum release, In the presence of patellofemoral osteoarthritis and patella aligned, the advance from the anterior tubercle of the tibia is recommended, only in this case the medialization not performed, because the cortical are of integrity in the distal portion of the slab it does not require screw fixing.

This osteotomy is different from that described by Fulkerson basically the bone cut is horizontal and not oblique, making this graft requires from Gerdy's tubercle to advance the slab 15 mm, the medialization is performed approximately 10 mm to 15 mm until the sign of the "J" disappears, in the distal portion of the slab the medial cortical is integrity and fixed with 2 screws, compressing them until the graft is not moving.

Bibliography

1. Reuven Minkowitz., *et al*. "Patella Instability". *Bulletin of the NYU Hospital for Joint Diseases* 65.4 (2007): 280-293.
2. Grelsamer RP. "Patellofemoral semantics. The tower of Babel". *The American journal of knee surgery* 10.2 (1997): 92-5.
3. Brian J., *et al*. "Patellofemoral Instability". *Bulletin of the NYU Hospital for Joint Diseases* 67.1 (2009): 22-29.
4. Chrisman OD., *et al*. "A long term prospective study of the Hauser and Roux Goldthwaite procedures for recurrent patellar dislocation". *Clinical Orthopaedics and Related Research* 144 (1979): 27.
5. Maquet PGJ. "Advancement of the Tibial Tuberosity". *Clinical Orthopaedics and Related Research* 115 (1976): 225-230.
6. Insall J., *et al*. "Proximal tube realignment of the patella for chondromalacia patellae". *Clinical Orthopaedics and Related Research* 144 (1979): 63-69.
7. Fulkerson JP. "Anteromedialization of the tibial tuberosity for patellofemoral malalignment". *Clinical Orthopaedics and Related Research* 177 (1983): 176-181.
8. V Sanchis A. "Dolor anterior de rodilla e inestabilidad rotuliana en el paciente joven". *Edit. Medica Panamericana* (2003): 352.
9. Maquet PGJ. "Biomechanics of the knee". *Springer* (1976).
10. Walsh W. "Recurrent Dislocation of the Knee in the Adult". *Delee and rez's Orthopae- dic Sports Medicine* 2 (2003): 1710-1749.
11. Nietosvaara Y. "The femoral sulcus in children. An ultrasono graphic study". *The Bone & Joint Journal* 76.5 (1994): 807-809.
12. Carrillon Y., *et al*. "Patellar instability: assessment on MR images by measuring the lateral trochlear inclination-initial experience". *Radiology* 213.2 (2000): 582-585.
13. Andrish J. "The biomechanics of patellofemoral stability". *Journal of Knee Surgery* 2004 17.1 (2004): 35-39.
14. Warren LA., *et al*. "The prime static stabilizer of the medical side of the knee". *The Journal of Bone and Joint Surgery* 56.4 (1974): 665-674.
15. Galland O., *et al*. "An anatomical and radiological study of the femoropatellar articulation". *Surgical and Radiologic Anatomy* 12.2 (1990): 119-125.
16. Nietosvaara Y., *et al*. "Acute patellar dislocation in children: Incidence and associated osteochondral fractures". *Journal of Pediatric Orthopaedics* 14.4 (1994): 513-515.
17. Atkin DM., *et al*. "Characteristics of patients with primary acute lateral patellar dislocation and their recovery within the first six months of injury". *The American Journal of Sports Medicine* 28.4 (2000): 472-479.
18. Onzaga D and Pardo C. "Luxación recurrente de patella". 19.4 (2010): 252-258.
19. Diehl L and Garrett WE. "Acute dislocation of the patella in the adult". *Orthopaedic Sports Medicine* (2003): 1697-1710.
20. Mäenpää H., *et al*. "Recurrence after patellar dislocation. Redislocation in 37/75 patients followed for 6-24 years". *Acta Orthopaedica Scandinavica* 68.5 (1997): 424-426.
21. Sanders T., *et al*. "Computed Tomography and Magnetic Resonance Imaging Evaluation of Patellofemoral Instability". *Operative Techniques in Sports Medicine* 9.3 (2001): 152-163.

22. DeLee J., *et al*. "Apprehension test". *Orthopaedic Sports Medicine: Principles and Practice* (2003): 1715.
23. "Depiction of two quadrants of lateral translation of the patella". *Clinical Sports Medicine* 21.3 (2002): 504.
24. Walsh WM. "Recurrent dislocation of the knee in the adult". *Orthopaedic Sports Medicine: Principles and Practice* (2003): 1718-1725.
25. Merchant AC., *et al*. "Roent genographic analysis of patellofemoral congruence". *The Journal of bone and joint surgery* 56.7 (1974): 1391-1396.
26. Diagnostico epidemiológico hospital de ortopedia. "Dr. Victorio de la FuenteNarváez", IMSS México, 2009-2011.
27. Reporte mensual del servicio de "Cirugia Articular Reconstructiva". 2009-2011.
28. Ramappa J., *et al*. "The Effcts of medicalization and anteromedialization of the tibial tubercle on patellofemoral Mechanics and Kinematics". *The American Journal of Sports medicine* 34. 5 (2006) : 749-756.

Volume 2 Issue 5 November 2015