International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2019; 5(2): 930-932

www.orthopaper.com
Received: 09-02-2019
Accepted: 14-03-2019

Dr. Kiran K C
Associate professor, Department of Orthopaedic, BGS Global institute of medical sciences, Uttarahalli Road, Kengeri, Bengaluru, Karnataka, India

Kirthi Shivalingaiah
Assistant Professor, Department of Orthopaedics, Uttarahalli Road, Kengeri, Bengaluru, Karnataka, India

Correspondence
Kirthi Shivalingaiah
Assistant Professor, Department of Orthopaedics, Uttarahalli Road, Kengeri, Bengaluru, Karnataka, India

Assessment of functional outcome of anterior cruciate ligament reconstruction using quadruple hamstring autograft

Dr. Kiran KC and Kirthi Shivalingaiah

DOI: https://doi.org/10.22271/ortho.2019.v5.i2n.114

Abstract
Introduction: The anterior cruciate ligament (ACL) tear is the most common ligamentous injury to the knee joint. To reconstruct the tear in ACL the grafts and the fixation techniques used to vary with different surgeons. The commonest ones used are Quadruple Hamstring Tendon Graft (QHTG) and Bone Patellar Bone Tendon Graft (BPBT).
Results: No patients were lost during follow up. The data suggests good functional outcome according to the KOOS Scoring. At the end of one year, they showed significant improvement with the KOOS score, thus enabling them to return to near normal function.
Conclusion: It was found that arthroscopic ACLR using QHTG enabled the patients to achieve excellent knee function and stability. The complications in this procedure were minimal.

Keywords: ACL, semitendinosus tendon graft, endobutton, bioabsorbable interference screw

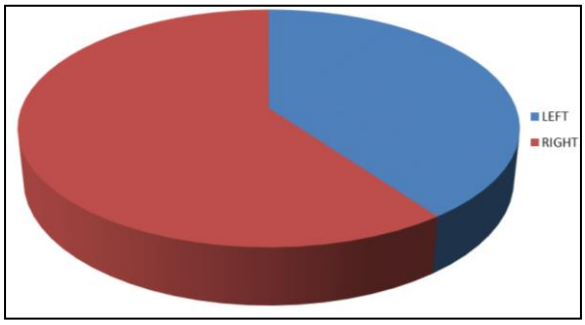
Introduction
Anterior cruciate ligament (ACL) is an important structure- related to dynamic and static forces in the knee joint and it's rupture is one of the most common injuries of the knee. About 250,000 ACL rupture occur in the United State each year and almost 100,000 ACL reconstruction are performed annually. Patients with a rupture of ACL may report pain, difficulty with athletic performance and/or giving-way symptoms in daily activities. ACL rupture may lead to knee laxity, resulting in functional instability and increased risk of meniscal injury, chondral lesions - and degenerative joint disease.
With the perfection of arthroscopic equipment, improvement of technology and advancement of basic research, arthroscopic ACL reconstruction has become a standard remedy for its favorable clinical effectiveness. However, there are still disputes within the published literature over the last 20 years regarding graft selection.
Despite highly success with autologous patellar tendon graft, concerns still remains regarding morbidity in donor-site and patellar function problems. So the use of triple- or quadruple-stranded hamstring tendon grafts for anterior cruciate ligament reconstructions has increased in popularity with less surgical site complications and high tensile load. Quadruple-stranded graft also provides a multiple bundle replacement graft that may better approximate the function of the two-bundle anterior cruciate ligament. Disadvantages of this soft tissue graft include the concern over tendon healing within the osseous tunnels and the lack ofrigid bony fixation.
Other advantages include smaller incision needed for graft harvest, less perioperative pain, less anterior knee pain and high maximum load to failure.
Increased understanding of technical issues of graft selection, placement, tensioning, and fixation as well as of postoperative rehabilitation led to dramatically improved results compared with previous intraarticular reconstructions. There are controversies regarding the clinical outcome and return to previous activity level in reported studies and the literature lacks enough research on this subject.

Materials and methods & observation
Source of data: The study was conducted on 30 patient, admitted with clinical and radiological

Deficiency of ACL during august 2016 to July 2018.

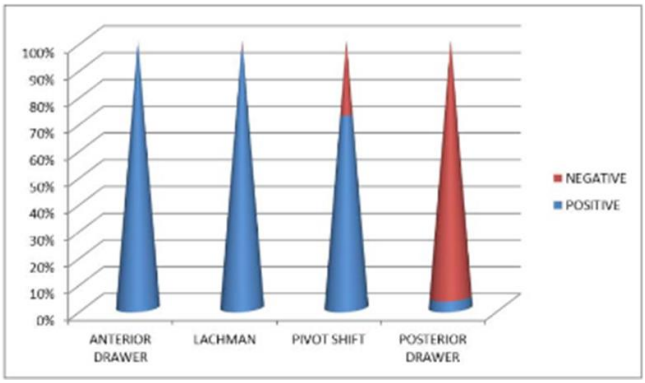
Table 1: 30 patients underwent ACL reconstruction by trans-tibial technique using quadruple hamstring graft. The mean age of the patients involved was 26.9years, with a male preponderance. The average height was 169.32 cm and an average body mass index of 24.375. 60% had a left sided injury, with most injuries happening in road traffic accidents (64%).

Side of injury	No of patients	Percentage
Left	12	40%
Right	18	60%
Total	30	100%



Graph 1: Side of Injury

As depicted in Graph 1, & Table 1, Left side injury was in 12 patients & right side injury was in18 Patients.



Graph 2: All the patients had positive anterior drawer test at grade 3. Lachman‟s test was positive in 96%, and pivot shift test was positive in 72%. The average graft length was 103.2mm with an average diameter of 7.9 mm. The preoperative Lysholm score was fair (65-83) in 56% and poor (<65) in 44%, it is improved to excellent (>90%) in 72% and 24% had a good outcome (84-90).

Discussion

The study comprises 30 patients who underwent single bundle anterior cruciate ligament reconstruction using quadrupled hamstring graft in our Hospital, for a period of two years. All patients were operated for the reconstruction using endobutton on the femoral side and interference screw on the tibial side.96% were male and 4% were female all aged between 15 to 45 years of age. 60% were injured in the left knee and 40% were injured in the right knee. Brown *et al* studied the incidence of the sidedness of limb injury and sex incidence and stated that although their study pointed that females are more prone to this injury, the incidence is yet, more in males due their increased exposure to work in a strenuous environment. They also hypothesed that limb sidedness have no influence in either during injury or the recovery period. Our study did not find any significance in the sidedness or the gender to the recovery during rehabilitation. An analysis of the efficiency of MRI in diagnosing internal derangement of knee, by Nikolaou *et al* reported accuracy for tears of medial, lateral meniscus, anterior and posterior cruciate ligaments and articular cartilage was 81,77,86,98 and 60 percentages respectively. 6 They also stated a lower reliability for accuracy in clinical examination, and avoids the surgical risks of a diagnostic arthroscopy. Our study had MRI accuracy of more than 90%. MRI is preferable to arthroscopic diagnosis before surgery. There is no clear consensus on the timing of surgery, although much has been studied so far in the literature. Most authors have opined on waiting for at least 3 weeks before ACL reconstruction from the time of injury. In our study we treated acute injuries with bracing and rehabilitation and restricted activity until swelling reduced and the patient regained functional range of motion in the knee. Perioperative edema, hyperaemia and ROM appear to influence the outcome of ACL surgery. Treme *et al* proposed that graft length is related to the height and BMI of the patient, while the diameter is related to the thickness of the thigh. 10He further opined that a graft diameter of <7 mm will have a higher risk of failure. The average length of the graft in our study was 103.2mm while the average diameter was 7.96 mm and the average BMI was 24.375 kg/m2Clinical evaluation of the patients for ACL reconstruction was done using the anterior drawer, Lachman‟s and the pivot shift tests. Pivot shift test correlated with complete ACL injury in all the cases. The anterior drawer test though was positive in all the patients, correlated to complete ACL injury in 26 cases while the rest were partial ACL injuries. Kocher *et al* evaluated the relation between an objective assessment of knee laxity and the subjective assessment of symptoms and function.11He opined that the pivot shift test was a better correlator of „functional stability" than the Lachman‟s test or instrumented knee laxity. In our study 96% the cases had a negative pivot shift test.27 out of 30 patients regained pre injury level activity. Preoperatively, 56% had fair while 44%have poor Lysholm scores. Postoperatively 72% had excellent scores at >90, 24% had a good score of 84-90 and 4% had a fair outcome at 65-83 with a mean score at 91.16%. IDKC scores were<40 preoperatively, which improved postoperatively, with at a score 50-60 in 72%. 24% had a score at 60-70 with a mean of 58.70. Lysholm scoring in our study significantly improved from mean preoperative scoring 58.76±15.29 to a mean post-operative score of 91.16±3.87 with a p value <0.001 which is comparable to Williams *et al* in which the mean score improved from 55 points to 91 points post operatively at a 2 year follow up (p<0.01).1256% of the patients were operated between 0-6 months, while 36%were operated between 6-12 months from the date of injury and 12% after one year of injury. Delay in surgery did not grossly affect the outcome, although one case was operated at 3 weeks of injury which had postoperative stiffness. IKDC scores in our study improved from a mean pre-operative score of 29.26±4.94 to a mean post-operative score of 58.70±4.45 with a p value <0.001. Our study was for 2years, probably the reason for a lower IKDC score. Despite demonstrating face validity, the IKDC scoring system there is the lack of patient contribution to item selection indicating that content validity cannot necessarily be assumed. Although the IKDC system is less subjective than most other scoring systems, it is possible it may give a less favorable result compared to other evaluating systems.

Conclusion

ACL reconstruction with quadruple hamstring graft is time tested technique. Adequate graft with appropriate thickness is

a prerequisite for the success of surgery. Timing of surgery, precision in technique and adequate rehabilitation are the variables which influence strongly the outcome of surgery. Lysholm scores and IKDC scores are useful parameters toaccess the outcome of surgery. Subjective assessment of each individual after the reconstruction, during follow up sometimes is equally important than relying on objective scoring systems.

References

1. John M Flynn. Orthopedic knowledge update, 10 editions, AAOS, 2011, 453-461.
2. Marker D Miller, Stephen R Thompson, Jennifer A Hart. Review of orthopedics, six editions, 2012, 298-231.
3. Spicer DDM, Blagg SE, Unwin AJ, Alum RE. Anterior knee symptoms after four strand hamstring tendon anterior cruciate ligament reconstruction. Knee Surge. Sport Traumatol Authors, 2008, 286-289.
4. Pinczewski LA, Salmon IJ, Jackson WF, *et al.* Toshiro S. Radiological landmarks for placement of tunnels in sigle bundle reconstruction of ACL. Journal Bone Joint Surge Br. 2008; 90:172-179.
5. Koutras, Giorgio, Papadopoulos, *et al*. Journal of Knee surgery, Sport traumatology, Arthroscopy. 2013; 21(8):1904.
6. Department of orthopedic surgery, Urmia University of medical sciences, Urmia, Iran. Comparison of short term clinical outcomes between transgibial and trans-portal ACL reconstruction. Act Ortho Traumatol Turc. 2012; 46(5):361-6.
7. Groin F, Buzz R, Ag, *et al*. Femoral tunnel position in anterior cruciate reconstruction using three techniques: A cadaver study. Arthroscopy. 1999; 15(7):750-756.