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ORIGINAL RESEARCH

Reconstruction Of Anterior Cruciate Ligament With Autologous Peroneus Longus Tendon Graft: A Prospective Study In Tertiary Care Hospital, Rajahmundry, Andhra Pradesh

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ABSTRACT

Background: ACL injuries are commonly associated with sports injuries and road traffic accidents. Incidence of ACL ruptures is estimated to range from 38-78 % per 100000 person years. The primary aim of ACL reconstruction is to restore the function of the ACL and native kinematics of the knee. ACL reconstruction restores the stability of the knee joint and protects the menisci and joint surfaces from further damage. The most preferred graft tissues for ACL reconstruction are hamstrings in view of better cosmesis, satisfactory results and to minimize postoperative mobility. However, use of peroneus tendon graft is increasing in view of simplicity of the technique. Peroneus longus graft harvest is possible due to synergistic action of peroneus longus and peroneus brevis. Even some studies suggest that peroneus brevis is more effective evertor than peroneus longus, justifying harvest of peroneus longus tendon.

Materials & Methods: We have done 26 cases of ACL injuries treated with arthroscopic ACL reconstruction using peroneus longus autograft at GSL medical college between Jan 2020 to Dec 2020. Cases were followed up for a period of 1 year and have been evaluated based on Lysholm, AOFAS and FADI score systems.

Results: In our study, all 26 patients have completed follow up for 1 year (19 male, 7 female). At final follow up anterior drawer test showed normal findings in 80percent, while 20 percent of all examined patients had 1+ anterior laxity.

Conclusion: Peroneus longus tendon is a promising autograft for ACL reconstruction with advantage of simplicity of harvesting technique, larger graft diameter, minimal graft complications.

Key Words: Reconstruction, Ruptures, Tendon

INTRODUCTION

ACL injuries are commonly associated with sports injuries and road traffic accidents. Incidence of ACL ruptures is estimated to range from 38-78 per 100000 person years. The primary aim of ACL reconstruction is to restore the function of the ACL and native kinematics of the knee. ACL reconstruction restores the stability of the knee joint and protects the menisci and joint surfaces from further damage. ACL reconstruction can be single bundle (anteromedial) or double bundle (both anteromedial and posterolateral) reconstruction. Double bundle ACL reconstruction is required only in patients with high athletic demands. The most preferred graft tissues for ACL reconstruction are hamstrings in view of better cosmesis, satisfactory results and to minimize postoperative mobility. Use of hamstring tendon graft is decreasing due to unpredictable graft size and reduction in hamstrings power post-harvest.[1-4] However, use of peroneus tendon graft is increasing in view of simplicity of the technique. Peroneus longus graft harvest is possible due to synergistic action of peroneus longus and peroneus brevis. Even some studies suggest that peroneus brevis is more effective evertor than peroneus longus, justifying harvest of peroneus longus tendon.

OBJECTIVES

- To assess the functional outcome of reconstruction of anterior cruciate ligament with autologous peroneus longus tendon graft.
- Cases will be followed up and assessed for a period of 1 year based on Lysholm, AOFAS and FADI score systems.

MATERIALS AND METHODS

We have done 26 cases of ACL injuries treated with arthroscopic ACL reconstruction using peroneus longus autograft at GSL medical college between Jan 2020 to Dec 2020. Cases were followed up for a period of 1 year and have been evaluated based on Lysholm, AOFAS and FADI score systems. After taking consent from the patients, under spinal anaesthesia, in supine position first a diagnostic arthroscopy was performed and diagnosis of ACL injury with/without meniscus and other ligamentous injury was confirmed. After arthroscopic debridement and preparation of femoral footprint for ACL, peroneus longus graft was taken (Fig. 1). A longitudinal skin incision is made over the posterolateral aspect of distal fibula of the affected limb. After hemostasis, peroneus longus tendon was identified and sutured distally with peroneus brevis tendon. Tendon was then harvested using closed tendon stripper. Graft was prepared and folded into double/quadruple strands for single bundle ACL reconstruction (Fig 2). Thereafter appropriate femur and tibial tunnels (Fig. 3) were created, and graft was secured at anatomical sites of femur and tibia using endobutton/titanium screw/PEEK (Polyethylene ether ketone) screw (Fig. 4). After reconstruction, the stability of ACL was checked by Lachman's test, which showed no laxity.

Post operatively, from first day patient is taught static quadriceps, ankle pump and knee range of motion exercises and partial weight bearing. Each patient was encouraged to stretch the affected ankle gently and actively from first day postoperatively. At 3rd week patients were allowed full weight bearing. Patients were assessed immediate post operatively and then followed up regularly at 1 month, 3 month and 6 months using lysholm score. Ankle biomechanics was assessed using AOFAS and FADI scores. Eversion power of ankle were noted at every follow-up and found to be normal and comparable to pre-operative power in all the patients thus there was no deterioration in ankle function.

Fig. 1: Showing peroneus longus (white shiny tendonious structure) and peroneus brevis (with muscle tissue) tendon

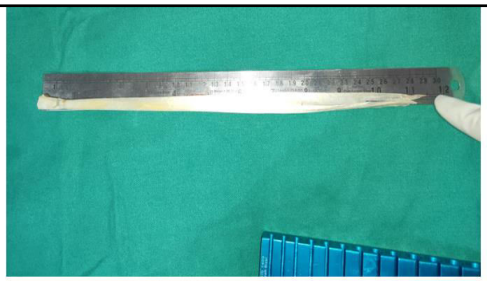

Fig. 2: Peroneus longus tendon (28 cms) graft preparation

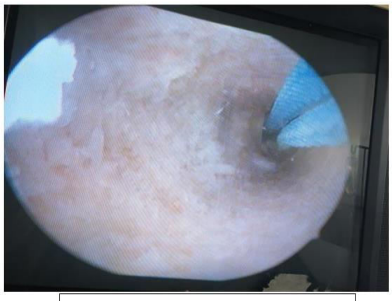

Fig. 3: Arthroscopic picture of femoral tunnel for graft

Fig. 4: Graft fixation using PEEK screw

Fig 5: POST OPERATIVE XRAYS OF KNEE JOINT

RESULTS

In our study, all 26 patients have completed follow up for 1 year. Out of the 26 cases, 19 cases were male (73%) and 7 cases were female (27%). At final follow up anterior drawer test showed normal findings in 80percent, while 20percent of all examined patients had 1+ anterior laxity.

TABLE 1: Overview of data

Patient	Pre op Lysholm score	Lysholm score at final follow-up	AOFAS at final follow-up	FADI score at final follow-up
1	68	96	95	95.6%
2	62	95	96	96%
3	58	87	93	94%
4	73	97	95	94.9%
5	70	96	92	93.7%
6	64	95	94	92.5%
7	62	95	97	95%
8	60	84	94	93.9%
9	72	97	93	92.9%
10	68	95	96	94.2%
11	69	96	93	95.7%
12	70	95	96	95.3%
13	70	97	95	94%
14	68	87	93	96%
15	64	95	92	94.3%
16	58	84	96	92.3%
17	64	95	92	93%
18	66	87	95	94.3%
19	70	96	96	96%
20	72	95	93	96%
21	68	97	95	94.3%
22	73	96	93	94%
23	71	95	95	95.6%
24	68	95	96	92.5%
25	72	95	95	94%
26	58	84	92	93%

Post operative full range of motion at 6th month at knee joint

Post operative ankle plantar flexion and dorsiflexion at 6th month

Fig. 6: clinical picture showing function/range of motion of knee and ankle.

DISCUSSION

Autograft choice is one of the most important considerations during ACL reconstruction surgery. In our study, we found comparable results with peroneus longus autograft at 1 year of follow-up. It also has advantage of larger graft diameter and simplicity of technique and minimal donor site morbidity[8,9]. Complications associated with hamstring graft like thigh hypotrophy[6], anterior kneeling pain, hypoaesthesia due to injury to infra patellar branch of saphenous nerve can be prevented. A previous study by Angthong et al mentioned possible donor site morbidity using peroneus longus autograft, such as reduced peak torque eversion and inversion, decreased ankle functions and concerns about ankle stability[3]. In our study mean for AOFAS is 94.5 and FADI is 94.34, which shows minimal donor site morbidity and no significant deterioration in ankle function. Peroneus longus autograft produces a excellent functional score (Lysholm scoring system) in 80% of our patients and remaining 20% patients had good functional score. (Fig. 6)

CONCLUSION

Peroneus longus tendon is a promising autograft for ACL reconstruction[10] with advantage of simplicity of harvesting technique, larger graft diameter and minimal graft complications. Proper harvesting technique does not deteriorate ankle functions, thus helps to avoid complications associated with other autografts.

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