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Clinical Outcome, Return to Pre-Injury Activities and Patients Satisfaction after Open ACL Reconstruction and Arthroscopic Reconstruction; An Experience from a Developing Country

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Material and Methods: Retrospective analysis of 600 patients undergoing open ACL reconstruction and arthroscopic reconstruction from 2005 to 2018 was done, at the Department of Orthopaedics, Ghurki Hospital, Lahore. We included all those patients who were 18 to 45 years of age and had at least 1 year follow up.

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Results: Out of 600 patients, there were 554 (92.3%) male and 46 (7.7%) female. Mean age of the patients was noted to be 30.2±4.3 years. Overall, mean duration of follow up was noted to be 12 months. Overall, there was no significant difference in between both the groups in terms of gender, age. In open ACL patients, mean LKS was noted to be 82.78 ±14.78 whereas in arthroscopic reconstruction group, mean LKS was noted to be 90.88± 13.22 while the difference between the two groups was statistically significant.

Conclusion: Majority of our patients were male. Although both studied procedures got good overall LKS but patients following arthroscopic reconstruction had significantly better LKS in comparison to open ACL reconstruction.

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I. Introduction

The Anterior Cruciate Ligament (ACL) has a major role in normal working of knee[1]. Rupture of ACL is one of the most common diagnosis in young patients either due to RTA or sports trauma. Reconstruction of the ACL allows the patient to resume sporting activities and prevents damage in meniscus and articular cartilage in turn reducing chances of arthritis.[2-4] There are two techniques for reconstruction of ACL, open technique and arthroscopic assisted technique. Arthroscopic assisted technique has many advantages over open procedure but it needs more expertise and cost comparatively. Currently, ACL reconstruction is most often performed using an arthroscopic assisted technique.[5]

Literature is deficient of ACL reconstruction data in developing countries. In developing countries like Pakistan, cost is the major issue. Athroscopic assisted ACL reconstruction is more expensive than open procedure. There is no large data available for such population which shows the clinical outcome after open & arthroscopic ACL reconstruction. The objective of this study is to identify the clinical outcomes on basis of lyshlomknee score (LKS) system and find out patients satisfaction after performing both procedures in two groups separately.

II. Material & Methods

Retrospective analysis of 600 patients undergoing open ACL reconstruction and arthroscopic reconstruction from 2005 to 2018 was done at Department of Orthopaedics, Ghurki hospital, Lahore. We included all those patients who were 18 to 45 years of age and had at least 1 year follow up. Amongst these patients, 500atients underwent open ACL reconstruction while 100 had arthroscopic reconstruction.

Lysholm scoring questionnaire as shown in Firgure-1[6,7] was adopted and enquired from all the

patients. Face to face interview was done with all the study participants. If the patient stated that he/she did not understand the question properly, more explanation regarding that particular question was given until the patient understood what he/she was asked. All the study participants were invited to hospital. All those participants who found to be in the clinically stable state, were excluded from this study. All those cases that had any new related injury after ACL reconstruction or arthroscopic reconstruction were also excluded from the study. Patients who had evidence of clinical and radiological degenerative change in the knee were also excluded.A standard script was followed for all the interviews to maintain a level of consistency. All the ethical standards written in "The Declaration of Helsinki 1964"[8] and its later amendments were fully followed in this study.

Means along with standard deviation were calculated for the lysholm scoring between patients undergoing ACL reconstruction or arthroscopic reconstruction. Chi square test was applied to compare the qualitative variables like gender, while remaining quantitative variables like age, duration of follow up and LKS were compared using t-test for any significant difference in between both the groups. P value less than or equal to 0.05 was considered as statistically significant.

SECTION 1 - LIMP
- ☐ I have no limp when I walk. (5)
- ☐ I have a slight or periodical limp when I walk. (3)
- ☐ I have a severe and constant limp when I walk. (0)

SECTION 2 - Using cane or crutches
- ☐ I do not use a cane or crutches. (5)
- ☐ I use a cane or crutches with some weight-bearing. (2)
- ☐ Putting weight on my hurt leg is impossible. (0)

SECTION 3 - Locking sensation in the knee
- ☐ I have no locking and no catching sensation in my knee. (15)
- ☐ I have catching sensation but no locking sensation in my knee. (10)
- ☐ My knee locks occasionally. (6)
- ☐ My knee locks frequently. (2)
- ☐ My knee feels locked at this moment.. (0)

SECTION 4 - Giving way sensation from the knee
- ☐ My knee gives way. (25)
- ☐ My knee rarely gives way, only during athletics or vigorous activity. (20)
- ☐ My knee frequently gives way during athletics or other vigorous activities. In turn I am unable to participate in these activities. (15)
- ☐ My knee frequently gives way during daily activities. (10)
- ☐ My knee often gives way during daily activities. (5)
- ☐ My knee gives way every step I take. (0)

SECTION 5 – PAIN
- ☐ I have no pain in my knee. (25)
- ☐ I have intermittent or slight pain in my knee during vigorous activities. (20)
- ☐ I have marked pain in my knee during vigorous activities. (15)
- ☐ I have marked pain in my knee during or after walking more than 1 mile. (10)
- ☐ I have marked pain in my knee during or after walking less than 1 mile. (5)
- ☐ I have constant pain in my knee. (0)

SECTION 6 – SWELLING
- ☐ I have swelling in my knee. (10)
- ☐ I have swelling in my knee on1y after vigorous activities. (6)
- ☐ I have swelling in my knee after ordinary activities. (2)
- ☐ I have swelling constantly in my knee. (0)

SECTION 7 – CLIMBING STAIRS
- ☐ I have no problems climbing stairs. (l0)
- ☐ I have slight problems climbing stairs. (6)
- ☐ I can climb stairs only one at a time. (2)
- ☐ Climbing stairs is impossible for me. (0)

SECTION 8 – SQUATTING
- ☐ I have no problems squatting. (5)
- ☐ I have slight problems squatting. (4)
- ☐ I cannot squat beyond a 90deg. Bend in my knee. (1)
- ☐ Squatting is impossible because of my knee. (0)

Total: _____/100

Figure 1: Lysholm knee score (LKS)[6,7]

III. Results

In this study, a total of 600 patients were included among these majority 554 (92.3%) were male and 46 (7.7%) were female patients with an average age of 30.2 ±4.3 years. Overall, mean duration of follow up was noted to be 21.4±5.6 months.

Table 1 showed the demographic profile of patients underwent two different surgical procedures, in group 1 500involvedunderwent open ACL among these93% were males and 7% were females with an average age of 30.27+4.2 years and follow up duration of 12 months as compared to group 2 where the patients of arthroscopic reconstruction took part in the study n=100 among these 89% were male participants and 11% were females with an average age of 29.57+4.7years and had the follow up duration of 12 months. The study reveals that there was no significant difference in between both the groups in terms of gender, age but duration of follow up were different in both groups as (p value ≤0.05).

Table 2 demonstrates the functional outcome of patients using Lysholm knee score among two groups of patients. In open ACL patients, majority 55% patients

reported excellent outcome, 30% with good outcome with an average score of 82.78±14.78 whereas in arthroscopic reconstruction group, majority reported excellent functional outcome as 90% reported excellent functional outcome and 2% with poor outcome with an average score of 90.88 ±13.22 and statistically significant difference were obtained in the mean LKS score in both groups as (p-value≤0.05).

Table 1: Demographic Profile of patients underwent two surgical Intervention (n=600)

n(%) or Mean±S.D

Characteristics		Open ACL (n=500)	Arthroscopic Reconstruction (n=100)	p-value
Gender	Male	465(93)	89(89)	0.2136
	Female	35(7)	11(11)	
Age (mean+SD)		30.27+_ 4.2	29.57+_ 4.7	0.1366
Duration of follow up		12	12	

Table 2: Functional outcome of Patientsusing LKS score among two Groups(n=600)

n(%)

	Group 1 Open ACL		Group 2 Arthroscopic ACL		
Outcome	n=500	**Mean±S.D**	**n=100**	**Mean±S.D**	**p-value**
Excellent	450(90)		55(55)		
Good	20(4)	82.78 ±14.78	30(30)	90.88±13.22	*0.021
Fair	20(4)		10(10)		
Poor	10(2)		5(%)		

**p-Value≤0.05 considered to be significant*

IV. Discussion

Open ACL reconstruction and arthroscopic reconstruction are not new as lots of literature is available about these two but the debate regarding which approach is better is still going on.[9]In this retrospective analysis, our objective was to compare LKS scores following ACL reconstruction and arthroscopic reconstruction, and comparing with each other.

Overall, 92.3% of the patients in our findings were male. It has been a well established fact that male population is more exposed to road accidents and outdoor activities,[10,11] this could be the major reason why significantly more male are reported involving reconstruction procedures.

Quite a few systems have been developed in the recent years evaluating pre as well as post operative condition of knee area. Different protocols are available but most are based on functional as well clinical evaluations. O'Donoghue is known to be the 1st to apply scale system aiming to evaluate post operative results.[12] Our objective was to compare the post operative outcome of ACL reconstruction and arthroscopic reconstruction in knee injuries based on follow up (at least 1 year). Various methods were considered aiming to evaluate knee region. We got attracted to Lysholmknee scaling (LKS) score which is based on the modified Lysholm protocol and has been used extensively all around the world. LKS has also been noted to have high reliability, validity as well as responsiveness all over the world.[13-17] This was the very

reason that we adopted this scale and we are confident that translating results using such scale will further benefit larger proportions of our population.

In the present study, open ACL patients, mean LKS was noted to be 82.78 with a standard deviation of 14.78 whereas in arthroscopic reconstruction group, mean LKS was noted to be 90.88 with a standard deviation of 13.22 while the difference between the two groups was statistically significant. In a recent study conducted by L. de Villiers[18] to find out the prevalence of osteoarthritis in the knee in the long term after ACL reconstruction, 43 patients were evaluated as per LKS. Mean KLS score was noted to be 84.35 in those patients. These results are very similar to our findings where we noted mean KLS score to be 82.78 in our patients.

A study done by Kose O et al[11] noted the mean LKS score to be 93.56 which is close to what we found in the present study. Overall mean follow up in that study was recorded to be 33.4 months which is quite higher in comparison to what we had in our findings. While comparing, open ACL reconstruction and arthroscopic reconstruction group, mean LKS was noted to be significantly higher in arthroscopic reconstruction patient showing overall better results of following this technique.

V. Conclusion

Majority of our patients were male. Although both studied procedures got good overall LKS but patients following arthroscopic reconstruction had significantly better LKS in comparison to open ACL reconstruction.

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