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Original Article

Correlations of Different Objective and Patient Related Outcome Measures for Patellar Instability Patients

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ABSTRACT

Objective: We aimed to evaluate the effectiveness of modified Aberdeen Weight-Bearing Test (Knee) (AWT-K) and KSS (Knee Society Score) comparing their correlations with the Tegner Lysholm (TL) score in patellar instability patients.

Methods: Patients treated for patellar dislocation were divided into two groups. The first group consisted of patients operated on for patellar instability and the second group patients followed by conservative means. Duration of follow-up, age, gender, Caton-Deschamps index, and type of surgical interventions were recorded. Since the TL scoring system was previously validated in the follow-up of patellar instability treatment, the compatibility of KSS and modified AWT-K scoring systems with the TL scoring system was evaluated and their effectiveness in the follow-up of patellar instability was examined.

Results: A moderate correlation was found between TL and total KSS scores.However, when the relationship between KSS subgroups ES, SS, OKS, FAS and TL is examined; a weak and moderate correlation was found between the TL scoring system and OKS, SS, and FAS. When weak and non-correlated ES and SS were excluded, there was a strong correlation between TL score and mtKSS.There was a low correlation between TL scores and AWT-K 60-second average load difference and there was a low correlation between FA and AWT-K 60-second mean load difference and ratios.

Conclusion: The weak correlation of the AWT-K test for weight-bearing on the knee with findings of KSS and the TL scoring system reveals that may not be an adequate follow-up instrument for patients with patellar instability in short-term follow ups.

INTRODUCTION

There are several anatomical structures and biomechanical forces that affect the stable position of the patellofemoral joint. The impairment between these structures can lead to patellar dislocation, instability, and disability.[1] Recurrent patellar instability is a common phenomenon after patellar dislocation, and the literature suggests that between 40% and 60% of patients experience recurrent patellar dislocation and subluxation after the first dislocation.[2] Several treatment procedures have been presented in the literature to prevent instability; nevertheless, there is no common consensus about the current treatment of patellar instability yet. Traditionally, patients are followed non-operatively following a first-time dislocation, and surgery is generally reserved for cases of recurrent instability following initial conservative management.[1,3] Patellofemoral degenerative changes causing anterior knee discomfort is a common complication that can be seen after both conservative and surgical treatment. Studies comparing clinical results of different treatment procedures for patellar dislocation have used subjective patient-reported outcome measures (PROMs) rather than objective outcomes. International Knee Documentation Committee (IKDC),[4] Tegner Lysholm (TL), and Kujala scores are widely used similar PROMs for the evaluation of patellar instability. Of these, the TL score is the most used tool even though it has been developed to evaluate knee ligament injuries rather than patellar instability. PROMs reflect a patient's subjective opinion on the burden of the disease, which is very important in clinical practice.[5,7] However, PROMs can also give mixed messages and can be negatively influenced

by psychosocial factors, measuring the patient's perception of an outcome, rather than the true outcome.[8] To appropriately evaluate the impact of the treatment on knee pain for patellar instability, it is necessary to use objective outcome measures in addition to PROMs.[9] Objective outcomes can be performed by a detailed evaluation of joint motion and muscle activity, with types of equipment and objective performance-based functional outcome tools in which the patient is observed performing tasks such as walking, getting up from a chair, or climbing stairs, and their performance quantified in a timeline.[9,10] On the other hand, objective scoring systems are only physician-derived and must be correlated with PROMs because the patient perspective on satisfaction and activity levels is more critical than the physician's perspective.[11] The Knee Society Score (KSS) is a validated system that combines an objective physician-derived component with a subjective patient-derived component that evaluates pain relief, functional abilities, satisfaction, and fulfillment of expectations.[12] Although this system has been developed to evaluate knee arthroplasty patients, it is currently being used after several knee surgeries also because this tool evaluates the knee globally and can be used in conjunction with other outcome measures.[12] The Aberdeen Weight-Bearing Test (Knee) (AWT-K) is an objective test specific for anterior knee discomfort assessed via direct load bearing.[9] However, both tests have not been correlated for their effectiveness in the treatment of patellar instability. In this study, we aimed to evaluate the effectiveness of modified AWT-K and KSS scores comparing their correlations with the TL score in patellar instability patients.

MATERIALS AND METHODS

After obtaining institutional ethics committee approval (ID:B10.1.TKH.4.34.H.GP.0.01/46), medical records of patients who were treated for patellar dislocation and instability in a single center between September 2015 and September 2020 were reviewed retrospectively. This study was conducted in accordance with principles for human experimentation as defined in the Declaration of Helsinki. Informed consent was obtained from all individuals prior to treatment.

Patients treated for patellar dislocation were divided into two groups. The first group consisted of patients operated on for patellar instability, and the second group consisted of patients followed by conservative means. Inclusion criteria for the surgery group were as follows: being operated on for patellar instability (indications for surgery; at least 2 verified dislocations, failed conservative treatment, ± tibial tuberosity-trochlear groove (TT-TG) distance ≥20mm, positive apprehension test), undergoing patellar realignment surgery (MPFL reconstruction with or without tuberosity tibia osteotomy), having the necessary medical records, at least 12 months of follow-up. The conservative group consisted of patients treated successfully by conservative means who did not sustain redislocation or any instability complaints. Patients undergoing an arthroscopic extraction of chondral fragments without medial reefing or MPFL repair after the first dislocation were also included in the second group as this was a symptomatic intervention rather than therapeutic. Patients undergoing an intra-articular fragment fixation after the first dislocation were not included in either of the groups.

Duration of follow-up, age, gender, injured site, TT-TG distance, Caton-Deschamps index, and type of surgical interventions were recorded for all patients. Functional and clinical outcomes were measured using three different scoring systems. Since the TL scoring system was previously validated in the follow-up of patellar instability treatment, the compatibility of KSS and modified AWT-K scoring systems with the TL scoring system was evaluated, and their effectiveness in the follow-up of patellar instability was examined. TL scoring is a PROM system evaluating daily activity and pain level with questions about eight aspects (limp, support, locking, instability, pain, swelling, stair-climbing, and swelling) at the final follow-up. With this tool, patient-derived results are scored from 0 to 100 points.

AWT-K was modified and used to assess anterior knee discomfort. Originally, this test evaluates the mean difference and weight-bearing ratio on a scale of 0, 15, 30, 45, and 60 seconds. However, we used weight distributions only at 60 seconds to ease the analyses of the data. The difference in the amount of weight between injured and uninjured extremities is defined as the mean difference in weight distribution at 60s (injured – uninjured), and the ratio of the amount of weight between injured and uninjured knees is defined as the mean ratio of weight distribution at 60s (injured:uninjured).

KSS combines objective physician-derived knee indicators (alignment, instability, ROM, symptoms; max; 100 points) with subjective patient-derived components that evaluate pain relief and function using functional activity (max; 100 points), satisfaction (max; 40 points), and expectation scores (15 points). The KSS system can be evaluated separately for every subgroup. However, we also evaluated the total KSS (max; 260) under these 5 subheadings.

Statistical Analyses Data were analyzed using SPSS software (ver. 22.0; IBM Corp., Armonk, NY, USA). The normality of the data distribution was evaluated by the Shapiro-Wilk test. Student's T-test and One-way ANOVA tests were used to compare quantitative data between independent groups. Categorical variables were compared using the Pearson chi-squared test and Monte Carlo simulations with Fisher's exact test. The Pearson correlation coefficient (rho) was calculated as a measure of the associations between categorical variables, and Spearman's correlation coefficient (r) was used to evaluate the association between non-parametric variables. (1=perfect positive correlation and -1=perfect negative correlation. r/rho <0.3 indicates none, r/rho 0.3-0.5 indicates weak, 0.5-0.7 indicates moderate, and r/rho >0.7 indicates strong correlation). Quantitative variables are expressed as mean ± standard deviation and minimum and maximum values.

Table 1. Demographic features of both groups 1

	Mean	Standart deviation	p
Age			
surgery	20,05	10,4650,092	
conservative	21,14	6,807	
Follow-up (months)			
surgery	25,1500	12,07989	1,000
conservative	25,5517	16,88318	
Deschamps İndex			
surgery	0,9950	0,26325	0,023
conservative	1,0841	0,18362	
TT-TG distance			
surgery	18,7650	5,27180	0,176
conservative	16,6448	5,03109	
Instability severity score			
surgery	4,5000	1,19208	0,0001
conservative	2,2707	1,59662	

TT-TG; Tibial Tuberosity-Trochlear Groove, Mann-Whitney U test.

Qualitative variables are expressed as frequencies or ratios. P-values <0.05 were considered to indicate statistical significance.

RESULTS

After initial review, 76 patients were identified to be followed for patellar dislocation. Of these, 32 had undergone patellar realignment surgery. Ten patients who were lost to follow-ups and two patients who had short follow-up durations were excluded from the study. Finally, the remaining 20 patients were included in the surgery group. Ten patients treated by conservative means were lost to follow-ups, and five who had undergone an articular fragment fixation after the initial dislocation were excluded as well. Nine patients who had undergone an arthroscopic extraction of chondral fragments without medial reefing, fragment fixation, or MPFL repair or reconstruction after initial referral, and 20 patients treated successfully by conservative means with a follow-up duration ≥12 months were included in the conservative group.

At the last follow-up, none of the patients in either the surgery group or the conservative group had sustained a redislocation. The mean follow-up time was 25.1 months in the surgery group and 25.2 months in the conservative group (p=1.0). While there was no significant difference between the mean age of the two groups and TT-TG distance (p=0.092 and 0.17), the Caton-Deschamps index was significantly lower in the surgery group, as expected (p=0.023). However, a TT osteotomy was performed for only 2 (10%) patients (Table 1, 2).

When the PROMs and objective knee findings of the two groups were compared, no significant difference was found between AWT-K mean difference and ratio weight distribution at 60s (p=0.46 and 0.343, respectively), total KSS score (p=0.427), satisfaction score (SS) (p=0.305), functional outcome score (FAS) (p=0.261), and TL scores (p=0.077). However, a significant difference was found between the expectation score (ES) (p=0.041) and objective knee scores (OKS) (p<0.005) of patients who underwent patellar knee surgery and those who were followed up conservatively. The mean OKS score was 92.7±3.29 in patients who underwent alignment surgery and 96.3±3.09 in

Table 2. Demographic features of both groups 2

Gender	**Female**	**Male**	**p**
Surgery	12 (60,0%)	8 (40,0%)	0,109
Conservative	11 (37,9%)	18 (62,1%)	
Dominant/injured side	**Right**	**Left**	**p**
Surgery	19 (95,0%)/9 (45,0%)	1 (5,0%)/11 (55,0%)	0,609/0,079
Conservative	22 (75,9%)/13 (44,8%)	7 (24,1%)/16 (55,2%)	

Pearson Chi-Square test.

Table 3. Comparison of mean values of scores between surgery and conservative groups

Group	Mean	Std. Deviation	P
OKS			
Surgery	92,7000	3,29433	0,000
Conservative	96,3793	3,09855	
SS			
Surgery	35,0000	6,30789	0,305
Conservative	34,3448	4,34475	
FAS			
Surgery	83,8000	17,38905	0,261
Conservative	91,0690	10,13809	
ES			
Surgery	13,6500	2,13431	0,041
Conservative	12,3793	2,33626	
KSS total			
Surgery	225,1500	26,13382	0,427
Conservative	234,4483	15,29142	
mtKSS Total(OKS +FAS)			
Surgery	176,5000	19,00277	0,026
Conservative	187,4483	11,58073	
Tagner-Lysholm Score			
Surgery	84,3000	17,35117	0,077
Conservative	90,7241	12,48398	
AWT-K mean difference			
Surgery	-5,8000	13,04486	0,461
Conservative	-1,8621	3,14784	
AWT-K mean ratio			
Surgery	0,8615	0,30947	0,343
Conservative	0,9366	0,09279	

KSS: Knee society scores; OKS: objective knee scores; SS; satisfaction scores; ES: expectation scores; FAS: functional activity scores; mKSS: modified total knee society score AWT-K: Aberdeen Weight-Bearing Test (Knee). Mann-Whitney U test.

patients who were followed conservatively. On the other hand, while the mean ES was 13.65±2.13 in patients who underwent alignment surgery, it was 12.3±2.3 in patients who were followed up conservatively (Table 3).

When the relationship between the 3 different scoring systems was examined, a moderate correlation was found between TL scores and total KSS scores ($p<0.001$, $r=0.618$). However, when the relationship between KSS subgroups ES, SS, OKS, and FAS and TL is examined in detail, a weak and moderate correlation was found between the TL scoring system and OKS, SS, and FAS ($p<0.001$, $r=0.423$, $r=0.307$, $r=0.546$, respectively), with no correlation found between patient expectation (ES) and TL scoring ($r=0.258$). When weak and non-correlated ES and SS were excluded and a modified total KSS (mtKSS) (consisting of FAS and OKS) was calculated and correlated, it was found that there was a strong correlation between TL score and mtKSS ($p<0.001$, $r=0.707$). In addition, the mtKSS was significantly different between surgically and conservatively treated groups ($p=0.026$). There was a low correlation between TL scores and AWT-K 60-second average load difference and ratios ($p<0.05$, $r=0.315$, $r=0.350$), and there was a weak correlation ($p<0.05$, $r=0.300$, $r=0.310$) between FAS scores and AWT-K. It was noted that there was no correlation between AWT-K, total KSS, mtKSS, ES, SS, and OKS subgroups (Table 4).

DISCUSSION

Patellofemoral pain is one of the most common symptoms encountered in the field of sports medicine and knee trauma. Considering the lack of a reliable objective assessment tool for patellofemoral pain after patellofemoral instability, we investigated the effectiveness of modified AWT-K and KSS scores by comparing their correlations with the TL score. We had hypothesized that patellar dislocation or subluxation, which disrupts patellofemoral anatomy, must result in a certain level of patellofemoral pain, causing the loss of functions. However, our results revealed that there was no notable correlation between objectively measured (AWT-K) pain and TL score and a very weak correlation between pain and KSS subgroups during short-term follow-ups. Our results showed that impairment in functional outcomes, which represents the daily activity

Table 4. Results of correlation evaluation of scoring system in association with treatment method

Spearman's rho	Tagner-Lysholm Score	KSS total	OKS	ES	SS	FAS mean	AWT-K mean difference	AWT-K method ratio	Treatment
Tagner-Lysholm									
CC	1,000	0,618**	0,423**	0,258	0,307*	0,546**	0,315*	0,350*	0,255
KSS total									
CC	0,618**	1,000	0,358*	0,505**	0,721**	0,877**	0,291*	0,272	0,115
mtKSS total (OKS +FAS)									
CC	0,707**	0,843**	0,601**	0,268	0,416**	0,926**	0,302*	0,327*	0,128
OKS									
CC	0,423**	0,358*	1,000	0,011	-0,089	0,328*	0,042	0,097	0,511**
ES									
CC	0,258	0,505**	0,011	1,000	0,513**	0,312*	0,155	0,087	-0,295*
SS									
CC	0,307*	0,721**	-0,089	0,513**	1,000	0,544**	-0,005	-0,080	-0,148
FAS									
CC	0,546**	0,877**	0,328*	0,312*	0,544**	1,000	0,300*	0,310*	0,162
AWT-K mean difference									
CC	0,315*	0,291*	0,042	0,155	-0,005	0,300*	1,000	0,981**	0,107
AWT-K mean ratio									
CC	0,350*	0,272	0,097	0,087	-0,080	0,310*	0,981**	1,000	0,137
Treatment method									
CC	0,255	0,115	0,511**	-0,295*	-0,148	0,162	0,107	0,137	1,000

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). KSS: Knee society scores; OKS: objective knee indicators; SS: satisfaction scores; ES: expectation scores; FAS: functional activity scores; mKSS: modified total knee society score; AWT-K: Aberdeen Weight-Bearing Test (Knee); CC: correlation coefficient.

levels of the patients, tends to occur due to malfunction of the patellofemoral joint rather than pain. Presumably, patellar instability or dislocation, causing weakness of surrounding muscle structures in conjunction with loss of proprioception, is the first to affect the functions prior to pain.[13] These are regained after proper rehabilitation and tend to improve during follow-ups.[13] Inversely, cartilage degeneration, which is the most likely mechanism to cause pain and disability in the patellofemoral joint, rarely causes pain before the third decade, and as revealed by this study, measuring the pain with AWT-K does not provide a practical benefit, at least for short-term follow-ups.[14]

Traditionally, patients are followed non-operatively following a first-time dislocation, and surgery is generally reserved for cases of recurrent instability following initial conservative management. The exception to this algorithm is that arthroscopic or open removal or fixation of intra-articular chondral fragments can be performed after the first dislocation.[15] In the case of patellar instability, underlying reasons for instability, including alignment pathologies of the patellofemoral joint, must be addressed surgically. These can be done with trochleoplasty, distal bony realignment of the tibial tuberosity, femoral and/or tibial derotational osteotomies, and medial soft tissue reconstruction procedures. However, the cause of recurrent dislocation is often multifactorial. Thus, a combination of procedures is often necessary to fully correct the alignment of the patellofemoral joint.[16] We operated on our patients following the algorithm mentioned above; thus, although outcomes were better for the conservatively treated group as expected, statistically significant differences could not be detected among conservatively and surgically treated patients by the means of AWT-K mean difference and ratio weight distribution, total KSS score, SS score, FAS score, and TL score. Our TL score outcomes were comparable with the current literature for the same treatment algorithm.[17] We believe that similar results of both groups represent the appropriate application of the algorithm to the practice, which results in good outcomes for the surgery group. However, the insignificant difference may have resulted from the ineffectiveness of the evaluation tools. Previously published studies have reported increased TL scores postoperatively, but perfect healing after surgery is not expected when compared with control groups or the contralateral extremity.[18,19]

As mentioned above, patellofemoral instability is a result of an alignment disorder in most cases, and the difference in OKS in both groups supports this claim.[20] Although

a combination of procedures is often necessary to fully correct the alignment of the patellofemoral joint, we did not perform femoral or tibial derotational osteotomies or trochleoplasty to fully correct the alignment as these osteotomies do not prevent the development of osteoarthritis in long-term follow-ups.[14] Thus, the OKS in the surgery group was worse as a result of alignment impairments despite the fact that the patella had centered over the femoral groove. Also, the ES was higher in the surgery group as expected because these patients suffer from patellar instability until surgery and mostly experience dislocations more than two or three times. Therefore, a postoperative stable patellofemoral joint seems to satisfy these patients, and they were better than they thought after surgery. However, the conservatively treated group mostly consisted of anatomically well-aligned patients with no functional impairment and good outcomes after rehabilitation without redislocation are expected. Thus, these patients seem to have met their expectations after the rehabilitation protocol.

The moderate correlation between TL score and total KSS score shows the KSS score to be useful for the evaluation of patellofemoral instability. But the weak correlation of ES, SS, and TL scores makes SS and ES scores ineffective. From this point of view, when we exclude weak and non-correlated ES and SS and calculated a mtKSS (consisting of FAS and OKS), we found that there was a strong correlation between TL score and mtKSS ($p<0.001$, $r=0.707$). In addition, the mtKSS was significantly different between surgically and conservatively treated groups ($p=0.026$). Although TL scores showed a near significant (0.077) difference (but not significant), a mtKSS showed a significant difference between groups and also a strong correlation with TL score. This finding showed that a combination of objective tools (OKS) and PROMs (FAS) were as effective as TL scores in the evaluation of patellofemoral instability. Because the TL score, which is a PROM, when used alone lacks objective evaluation tools, possesses the risk of measuring only the patient's perception of the outcome, rather than the true outcome.[8]

One of the major drawbacks of PROMs is the preoperative "floor" and postoperative "ceiling" effects.[21] However, Cronbach's alpha, floor/ceiling effects, and test-retest reliabilities were not evaluated in this study, as all three scoring systems were evaluated and validated for knee pathologies previously.[7,12,22] The Kujala Anterior Knee Pain Scale is another validated scoring system that is designed particularly for patients with patellofemoral pain, used after a patellar dislocation or subluxation.[6] The Kujala scoring system evaluates patient daily activity and pain level similarly to the TL scoring system, with questioning 13 items (running, jumping, atrophy of the thigh, flexion deficiency, squatting, and the 8 items of the TL scoring system). Previous studies have used the Kujala score to assess anterior knee pain and the TL score to evaluate daily activity levels, even though both are PROMs.[17] As mentioned previously, to appropriately evaluate the impact of the treatment on knee pain for patellar instability, it is necessary to use objective outcome measures in addition to PROMs.[9] Thus, rather than using two PROMs to evaluate patellofemoral instability outcomes, as revealed in this study, using a PROM in conjunction with an objective tool could be more useful. We preferred to use the TL score in this study because it was easier to use and analyze. However, the Kujala tool could also be used, as both are questioning similar items and are valid PROMs for patellofemoral instability.

There were some limitations in this study. First, the number of patients included was relatively low. Second, we evaluated the effectiveness of modified AWT-K and KSS scores by comparing their correlations with the TL score. However, modified AWT-K and KSS scores must also be compared with other commonly used scoring systems for the evaluation of the knee after patellofemoral instability (such as the International Knee Documentation Committee, Kujala scores, etc.) in larger cohorts to draw exact conclusions.

Conclusion

The TL scoring system, which is a frequently used PROM in the follow-up of patellar instability, may be assessed together with the mtKSS scoring system and its subgroups, objective knee scores, and functional activity scores safely. However, the weak correlation of the AWT-K test for weight-bearing on the knee with both the objective findings of KSS and the Tegner-Lysholm scoring system reveals that it is not an adequate instrument for follow-up in patients with patellar instability, at least in short-term follow-ups. We believe this study may create a base for further studies to advance a better scoring system for patellofemoral instability patients.

Ethics Committee Approval

This study approved by the Umraniye Training and Research Hospital Ethics Committee (Date: 10.02.2022, Decision No: B.10.1.TKH.4.34.H.GP.0.01/46).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: M.S.S.; Design: G.A.; Supervision: M.E.K.; Fundings: M.E.K.; Materials: M.M.O.; Data: M.M.O.; Analysis: M.S.S.; Literature search: M.E.K.; Writing: M.E.K.; Critical revision: G.A.

Conflict of Interest

None declared.

REFERENCES

1. O'Sullivan ST, Harty JA. Patellar stabilization surgeries in cases of recurrent patellar instability: A retrospective clinical and radiological audit. Ir J Med Sci 2021;190:647–52. [CrossRef]

2. Mäenpää H, Lehto MU. Patellar dislocation. The long-term results of nonoperative management in 100 patients. Am J Sports Med 1997;25:213–7. [CrossRef]
3. Petri M, Liodakis E, Hofmeister M, Despang FJ, Maier M, Balcarek P, et al. Operative vs conservative treatment of traumatic patellar dislocation: Results of a prospective randomized controlled clinical trial. Arch Orthop Trauma Surg. 2013;133:209–13. [CrossRef]
4. Irrgang JJ, Anderson AF, Boland AL, Harner CD, Kurosaka M, Neyret P, et al. Development and validation of the international knee documentation committee subjective knee form. Am J Sports Med 2001;29:600–13. [CrossRef]
5. Tegner Y, Lysholm J. Rating systems in the evaluation of knee ligament injuries. Clin Orthop Relat Res 1985;198:43–9. [CrossRef]
6. Kujala UM, Jaakkola LH, Koskinen SK, Taimela S, Hurme M,Nelimarkka O. Scoring of patellofemoral disorders. Arthrosc 1993;9:159–63. [CrossRef]
7. Collins NJ, Misra D, Felson DT, Crossley KM, Roos EM. Measures of knee function: International Knee Documentation Committee (IKDC) Subjective Knee Evaluation Form, Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Knee Outcome Survey Activities of Daily Living Scale (KOS-ADL), Lysholm Knee Scoring Scale, Oxford Knee Score (OKS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Activity Rating Scale (ARS), and Tegner Activity Score (TAS). Arthritis Care Res Hoboken 2011;63(Suppl 11):S208–28. [CrossRef]
8. Rosenberger PH, Jokl P, Ickovics J. Psychosocial factors and surgical outcomes: An evidence-based literature review. J Am Acad Orthop Surg 2006;14:397–405. [CrossRef]
9. MacDonald DRW, Rehman H, Carnegie CA, Tomas-Hernandez J, Johnstone AJ. The Aberdeen Weight-Bearing Test (Knee): A new objective test for anterior knee discomfort. Eur J Trauma Emerg Surg 2020;46:93–8. [CrossRef]
10. Podsiadlo D, Richardson S. The timed "Up & Go": A test of basic functional mobility for frail elderly persons. J Am Geriatr Soc 1991;39:142–8. [CrossRef]
11. Scuderi GR, Bourne RB, Noble PC, Benjamin JB, Lonner JH, Scott WN. The new Knee Society Knee Scoring System. Clin Orthop Relat Res 2012;470:3–19. [CrossRef]
12. Noble PC, Scuderi GR, Brekke AC, Sikorskii A, Benjamin JB, Lonner JH, et al. Development of a new Knee Society scoring system. Clin Orthop Relat Res 2012;470:20–32. [CrossRef]
13. Małecki K, Fabiś J, Flont P, Fabiś-Strobin A, Niedzielski K. Assessment of knee flexor muscles strength in patients with patellar instability and its clinical implications for the non-surgical treatment of patients after first patellar dislocation - pilot study. BMC Musculoskelet Disord 2021;22:740. [CrossRef]
14. Rouanet T, Gougeon F, Fayard JM, Rémy F, Migaud H, Pasquier G. Sulcus deepening trochleoplasty for patellofemoral instability: A series of 34 cases after 15 years postoperative follow-up. Orthop Traumatol Surg Res 2015;101:443–7. [CrossRef]
15. Paša L, Veselý R, Kočiš J, Kužma J, Herůfek R. Treatment of Extensive Chondral Defects of the Patella after Patellar Dislocation. Acta Chir Orthop Traumatol Cech [Article in Czech] 2017;84:441–7. [CrossRef]
16. Cerciello S, Lustig S, Costanzo G, Neyret P. Medial retinaculum reefing for the treatment for patellar instability. Knee Surg Sports Traumatol Arthrosc 2014;22:2505–12. [CrossRef]
17. Pautasso A, Sabatini L, Capella M, Saccia F, Rissolio L, Boasso G, et al. Anatomic medial patellofemoral ligament (MPFL) reconstruction with and without tibial tuberosity osteotomy for objective patellar instability. Musculoskelet Surg 2022;106:441–8. [CrossRef]
18. Su P, Liu X, Jian N, Li J, Fu W. Clinical outcomes and predictive factors for failure with MPFL reconstruction combined with tibial tubercle osteotomy and lateral retinacular release for recurrent patellar instability. BMC Musculoskelet Disord 2021;22:632. [CrossRef]
19. Sappey-Marinier E, Sonnery-Cottet B, O'Loughlin P, Ouanezar H, Reina Fernandes L, Kouevidjin B, et al. Clinical outcomes and predictive factors for failure with ısolated MPFL reconstruction for recurrent patellar ınstability: A series of 211 reconstructions with a minimum follow-up of 3 years. Am J Sports Med 2019;47:1323–30. [CrossRef]
20. Smith TO, Donell S, Song F, Hing CB. Surgical versus non-surgical interventions for treating patellar dislocation. Cochrane Database Syst Rev 2015;26;CD008106. [CrossRef]
21. Wamper KE, Sierevelt IN, Poolman RW, Bhandari M, Haverkamp D. The Harris hip score: Do ceiling effects limit its usefulness in orthopedics? Acta Orthop 2010;81:703–7. [CrossRef]
22. Crossley KM, Bennell KL, Cowan SM, Green S. Analysis of outcome measures for persons with patellofemoral pain: Which are reliable and valid? Arch Phys Med Rehabil 2004;85:815–22. [CrossRef]

Patellar İnstabilitesi olan Hastalarda Farklı Skorlamalar ve Hasta Bağımlı Sonuçların Korelasyonu

Amaç: Patellar instabilite hastalarında modifiye Aberdeen Weight-Bearing Testi (Diz) (AWT-K) ve KSS (Knee Society Score) ile Tegner Lysholm (TL) skoru arasındaki korelasyonun etkinliğini değerlendirmeyi amaçladık.

Gereç ve Yöntem: Patella çıkığı nedeniyle tedavi edilen hastalar iki gruba ayrıldı. Birinci grup patellar instabilite nedeni ile opere edilen hastalardan, ikinci grup ise konservatif yöntemlerle takip edilen hastalardan oluşturdu. İzlem süresi, yaş, cinsiyet, Caton-Deschamps indeksi ve uygulanan cerrahi girişimlerin tipi kaydedildi. TL skorlama sistemi daha önce patellar instabilite tedavisi takibinde valide edildiğinden, KSS ve modifiye AWT-K skorlama sistemlerinin TL skorlama sistemi ile uyumu değerlendirilerek patellar instabilite takibindeki etkinliği incelenmiştir.

Bulgular: TL ile toplam KSS puanları arasında orta düzeyde bir korelasyon bulundu. Ancak KSS alt grupları ES, SS, OKS, FAS ve TL arasındaki ilişki incelendiğinde; TL puanlama sistemi ile OKS, SS ve FAS arasında zayıf ve orta düzeyde bir korelasyon bulundu. Zayıf ve korelasyonsuz ES ve SS hariç tutulduğunda, TL puanı ile mtKSS arasında güçlü bir korelasyon vardı. TL puanları ile AWT-K 60 saniye ortalama yük farkı arasında düşük bir korelasyon vardı ve FA ile AWT-K 60 saniye ortalama yük farkı ve oranları arasında düşük bir korelasyon vardı.

Sonuç: AWT-K testinin diz üzerine yük bindirme ile KSS bulguları ve TL skorlama sistemi arasındaki zayıf korelasyonu, patella instabilitesi olan hastalarda kısa dönem takiplerde yeterli bir takip aracı olmayabileceğini ortaya koymaktadır

Anahtar Sözcükler: Fonksiyonel sonuç; patellofemoral instabilite; patellar subluksasyon; tekrarlayan patella çıkığı.