



QUALITY OF LIFE OF PATIENTS WITH ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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ABSTRACT

The anterior cruciate ligament (ACL) rupture is the most common ligamentous injury. It occurs through hyperflexion or hyperextension of the stifle joint, combined with rotation of the fixed lower leg during sports activities. Football, basketball, skiing, and other sports are major sports predisposing individuals to ACL rupture, as they often involve abrupt changes in movement direction and high jumps. Micro ruptures, partial and total ruptures are distinguished. The ligament rupture impairs the entire arthrokinematics of the lower extremity, joint stability and poses a risk of various complications due to accompanying locomotor restrictions.

The aim of the present research was to investigate the quality of life in patients following reconstruction of the anterior cruciate ligament.

Materials and methods. The study cohort comprised 35 patients with isolated ACL rupture treated by patellar tendon reconstruction. The quality of life of patients after the reconstruction was investigated by means of questionnaires and functional examinations.

Results and discussion. All studied patients experienced locomotor restrictions during daily life activities. The major part of the cohort indicated worsened health and psycho-emotional tone. According to the results, the higher the restrictions, the lower the expectations of patients about the recovery outcome.

Conclusion. The good psycho-emotional state of patients plays an essential role during the recovery from traumatic injuries and for improving life quality, early return to sports and professional activities.

Keywords: anterior cruciate ligament, quality of life, kinesiotherapy,

INTRODUCTION

Together with other ligamentous structures from the stifle joint, the anterior cruciate ligament (ACL) is responsible for joint stability by restricting pathological mobility. That is why the ligament is subject to abnormal loads, which often exceed its mechanical limit and result in its injury [1]. Almost half of sports traumatic injuries affect the stifle joint, and 78% involve the ACL [2]. The average annual rate of traumatic injuries in the stifle region in the USA is about 2 million, 70% of which are accompanied by ACL rupture [3]. The mechanism of the traumatic injury is hyperflexion or hyperextension of the knee, combined with rotation of the fixed lower leg during sports activities. Sports most predisposing to such injury are football, basketball, skiing, etc. The ACL rupture may be isolated or accompanied by damage to other structures [4]. Micro ruptures, partial and total ruptures are distinguished. The ligament rupture impairs the entire arthrokinematics of the lower extremity, joint stability and poses a risk of various complications due to accompanying locomotor restrictions. An abnormal gait, causing early arthritic changes of the stifle, is observed [5]. Injuries to the lower extremities at a young age increase the risk of physical inactivity and, in the long term, fat tissue accumulation. The development of osteoarthritis is also promoted by the high obesity index due to increased mechanical load on joints [6]. Kinesiotherapy is an integral part of the recovery process of patients following ACL rupture or reconstruction. The aims and tasks are dependent on the pre-traumatic level of physical activity and are mainly targeted at return to locomotor potential prior to the injury [7]. In sportsmen, the aim is to return to sports activities with minimum risk from recurrence of the injury [8]. The efforts are focused on lower leg muscles, which would provide stability of the stifle joint [9]. Lower limb injuries affect both the physical capabilities and the mental state of the patient. [10] Medical and social rehabilitation aims to improve the quality of life for patients by strengthening motor activity, reducing anxiety, and mitigating the adverse effects of limb injury. [11] Locomotion impairment impairs quality of life, which requires a comprehensive medico-social approach to overcome limited activities.

The aim of the present research was to investigate the quality of life in patients following reconstruction of the anterior cruciate ligament.

MATERIAL AND METHODS

The study cohort comprised 35 patients with isolated rupture of the anterior cruciate ligament treated by patellar tendon reconstruction. Before the kinesiotherapeutic procedures, patients were submitted to functional examinations for evaluation of their rehabilitation potential. Several questionnaires were developed and filled out by patients for the determination of their lifestyle before the ACL rupture and after the ACL reconstruction:

- Registration card including personal information, diagnosis, treatment method, social status and risk factors;
- Questionnaire survey of patients for the determination of locomotor activity before the injury;
- Questionnaire survey of patients for evaluation of pain.

The distribution of the patients according to sex was 71.4% (n=25) males and 28.6% (n=10) females ($\chi^2=0.232$; $P=0.6303$). In relation to current employment status, 65.7% (n=23) of patients were working, whereas 34.3% (n=12) did not work ($\chi^2=0.896$; $P=0.3438$).

Data were processed and analyzed with the following statistical tests - Kolmogorov-Smirnov test; descriptive statistical analysis; analysis of between-group differences; Pearson's chi-square test (χ^2 test). The functional examinations for evaluation of locomotor potential included disease history, inspection, palpation, goniometry, anthropometric measurements, manual muscle testing, shortening tests, muscle tone and gait evaluation.

RESULTS AND DISCUSSION

The distribution of patients according to the pre-injury locomotor activity was as followed ($\chi^2=3.042$; $P=0.3852$):

Table 1. Distribution of the patients' cohort in relation to locomotor activity

		χ^2	P
• Active lifestyle	14.3% (n=5)	3.042	0.3852
• Amateur sports activities	48.6% (n=17)		
• Professional sports activities	17.1% (n=6)		
• Sedentary lifestyle	20.0% (n=7)		

The study of the subjective evaluation of the cohort's general locomotion status after ACL reconstruction demonstrated that 48.6% (n=17) of patients had partially restricted locomotor activity. Totally restricted locomotion was indicated by 40.0% (n=14), whereas 11.4% (n=4) did not indicate any change in the locomotor activity ($\chi^2=4.076$; $P=0.1303$). The patients walking with an aid were 48.6% (n=17), vs 51.4% (n=18) that walked independently ($\chi^2=0.027$; $P=0.8695$).

The investigation of the possibility of performing daily locomotor activities after the surgical intervention showed restrictions only in specific activities - 65.7%

(n=23). All daily activities were limited in 22.9% (n=8). No difficulties were encountered in 11.4% (n=4) of patients ($\chi^2=1.516$; $P=0.4686$). It should be noted that respondents were allowed to indicate more than one answer to this question.

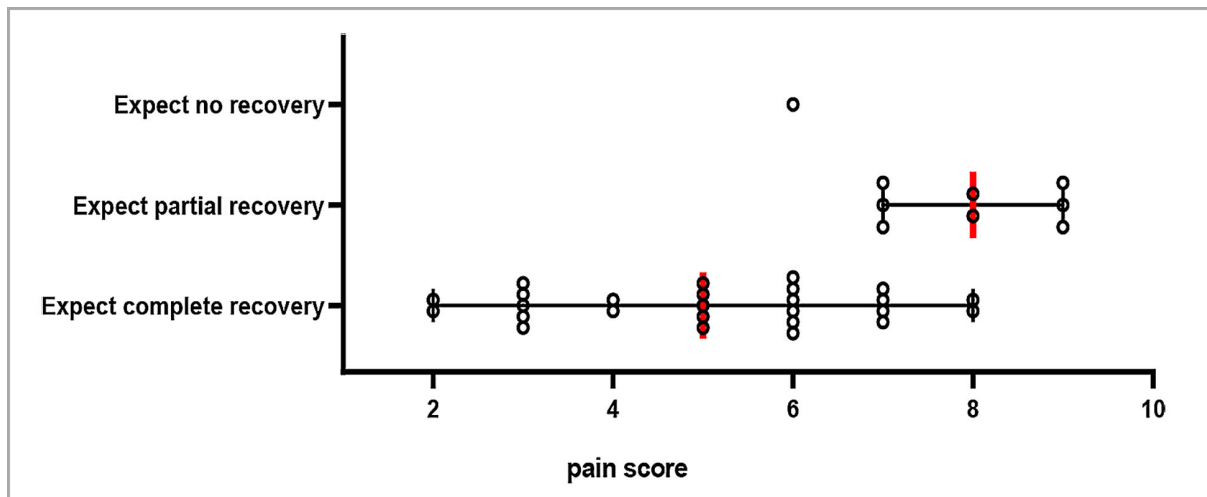
With regard to the general health, the questionnaire results indicated that 57.1% (n=20) of patients considered their health as satisfactory, 40.0% (n=14) as non-satisfactory and only 2.9% (n=1) as excellent. The analysis of answers revealed that in 88.6% (n=31), the locomotor activity while performing daily life activities and self-care was reduced, indicating a worsened quality of life. The non-satisfactory health status has a negative impact on patients' psycho-emotional state and contributed to enhanced hypokinesia after ACL reconstruction. A large part of patients were informed about poor health and psycho-emotional tone. The higher the difficulties, the lower the expectations for recovery were. This creates a prerequisite for a lack of motivation about active involvement in kinesiotherapeutic sessions.

Pain is an inevitable element of the postoperative picture following ACL reconstruction. It is the main factor limiting the stifle range of motion and cause for leg hypokinesia. A detailed investigation on all important criteria of pain was conducted – presence, strength, localization, character, time of onset. The results are presented in Table 2.

Table 2. Results from the questionnaire for evaluation of pain

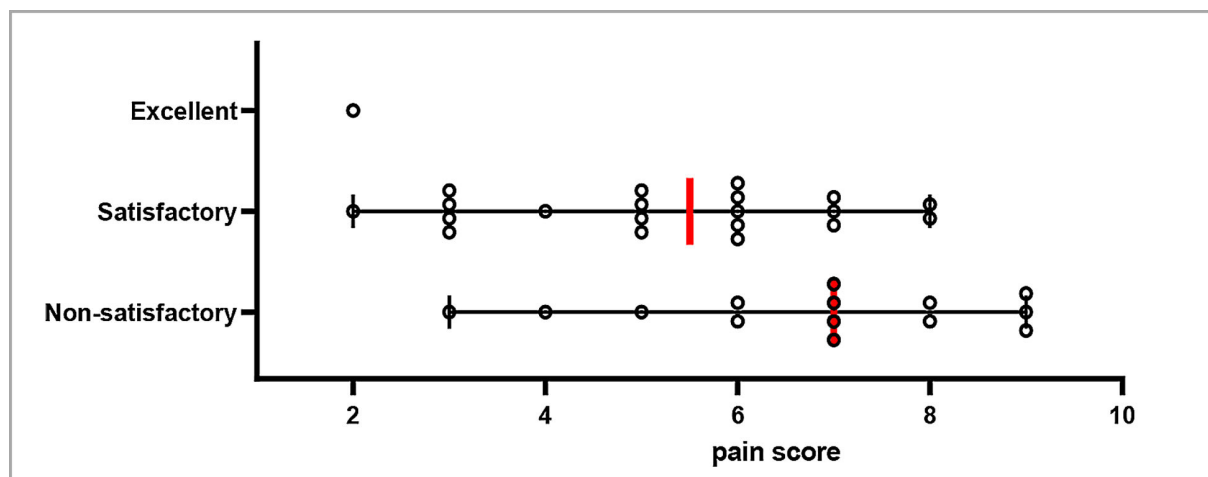
	n=35	P	χ^2
Presence of pain			
• Yes	(51.4%) (n=18)	0.4003	0.707
• Occasionally	(48.6%) (n=17)		
• No	-		
Character of pain			
• Constant pain	22.6% (n=4)	0.5209	6.162
• Sporadic pain	108.3% (n=19)		
• Nocturnal pain	5.6% (n=1)		
• Pain after slight exercise	63.1% (n=11)		
• Pain after considerable exercise	73.3% (n=13)		
Localization of pain			
• The pain is precisely localized	97.1% (n=34)	0.9769	0.001
• The pain is migrating localized	2.9% (n=1)		

Fig. 3. Association between the severity of pain and expectations of patients



There was a statistically significant difference between the pain scores of patients whose subjective health status was evaluated as satisfactory and non-satisfactory (Fig. 4). The higher pain scores were observed in patients claiming to be in satisfactory vs those in non-satisfactory health ($P=0.019777$). It may be concluded that pain had a negative impact on the subjective assessment of the patient’s health status.

Fig. 4. Association between the severity of pain and the health status of patients



CONCLUSION

The good psycho-emotional state of patients plays an essential role during the recovery from traumatic injuries and for improving life quality, early return to sports and professional activities. The pain and restrictions of movements of the lower leg significantly influence the entire physical and psycho-emotional state of patients following ACL reconstruction surgery. The worsening of patients’ health can negatively impact their motivation and attitude toward rehabilitation.

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REFERENCES:

1. Kostov R. [Physiotherapy for Soft-Tissue Injuries in the Stifle Complex Region] [in Bulgarian] *Sofia: Avangard Prima*. 2013. 231 p.
2. Corban J, Lorange JP, Laverdiere C, Khoury J, Rachevsky G, Burman M, et al. Artificial Intelligence in the Management of Anterior Cruciate Ligament Injuries. *Orthop J Sports Med*. 2021 Jul 2;9(7):232596712111014206. [PubMed]
3. Noyes FR, Barber-Westin SD. Revision anterior cruciate surgery with use of bone-patellar tendon-bone autogenous grafts. *J Bone Joint Surg Am*. 2001 Aug 83(8):1131-43. [PubMed]
4. Kanchev D. [Kinesitherapy after anterior cruciate ligament reconstruction.] [in Bulgarian] *Sofia: Avangard Prima*; 2016, 33 p.
5. Popov N. [Kinesiology and Pathokinesiology of the Locomotor Apparatus.] [in Bulgarian] *Sofia: NSA Press*; 2009. 286 p.
6. Toomey CM, Whittaker JL, Nettel-Aguirre A, Reimer RA, Woodhouse LJ, Ghali B, et al. Higher Fat Mass Is Associated With a History of Knee Injury in Youth Sport. *J Orthop Sports Phys Ther*. 2017 Feb;47(2):80-87. [PubMed]
7. Popov N. [Nature, features and development of modern kinesitherapy.] [in Bulgarian] *Sport & Science*. 2010 Suppl 1:347-351. [Internet]
8. Erickson LN, Sherry MA. Rehabilitation and return to sport after hamstring strain injury. *J Sport Health Sci*. 2017 Sep;6(3):262-270. [Crossref]
9. Becheva M, Pavlova G, Kruchkova P, Petrova R. [Kinesitherapy in meniscectomy.] [in Bulgarian] *Knowledge Int J*. 2018 May; 23(2):529-534. [Internet]
10. Vacheva D, Petkova I, Drumev A, Petrov R. [The problems in the quality of life in patients with disordered locomotion – a comparative analysis.] [in Bulgarian] *Proceedings 50 years of Medical Education and Science in Pleven. MU-Pleven*. November 2024; 789-794. [Internet]
11. Vacheva D, Petkova I, Drumev A. [Recovery of social functioning in patients after lower limb injury.] [in Bulgarian] *J Manag Educ*. 2024; 20(6):168-174. [Internet]
12. Drumev A, Vacheva D, Petkova I, Petrov R. [Medicosocial rehabilitation – a factor for improving the quality of life in patients with disordered locomotion.] [in Bulgarian] *Proceeding of the 6 Scientific Conference of the BNDOZ. Pleven 26-27 May 2023. MU-Pleven*. 2023; 358-363 [Internet]

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