

DIAGNOSIS AND TREATMENT OF LATERAL MENISCUS INJURY OF THE KNEE JOINT AND PATELLAR TENDON ENTHESOPATHY IN ATHLETES

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Abstract. Knee joint injuries represent one of the most significant problems in modern sports traumatology and orthopedics due to their high prevalence, complex pathogenesis, and long-term functional consequences. Among athletes, injuries of the lateral meniscus of the knee joint and patellar tendon enthesopathy are frequently observed as a result of repetitive mechanical overload, rotational stress, and chronic microtrauma. These pathological conditions may occur both independently and concomitantly, complicating diagnostic evaluation and therapeutic decision-making. The present study was conducted at the Khorezm multidisciplinary medical center, department of traumatology and orthopedics, and aimed to analyze diagnostic features and treatment outcomes in athletes with lateral meniscus injury combined with patellar tendon enthesopathy. The findings demonstrate that an integrated diagnostic approach and differentiated treatment strategy significantly improve functional outcomes and facilitate early return to sports activities.

Key words: knee joint, lateral meniscus injury, patellar tendon enthesopathy, athletes, diagnosis, treatment

Introduction. Sports-related injuries of the musculoskeletal system remain a leading cause of morbidity among athletes and pose a substantial challenge for healthcare systems worldwide. The knee joint, due to its complex anatomical structure and pivotal role in locomotion, weight-bearing, and dynamic stability, is particularly vulnerable to traumatic and overload-related injuries. Epidemiological studies indicate that knee joint injuries account for up to one-third of all sports-related musculoskeletal disorders, emphasizing their clinical and social significance [1].

Meniscal injuries are among the most frequently encountered intra-articular knee pathologies. The lateral meniscus, characterized by greater mobility and involvement in rotational movements, is especially susceptible to injury in athletes engaged in sports requiring sudden changes in direction, pivoting, and jumping. The lateral meniscus plays a crucial role in load distribution, shock absorption, joint stabilization, and protection of the articular cartilage. Damage to this structure leads to altered knee biomechanics, increased contact stress, and acceleration of degenerative changes within the joint [2,3].

Patellar tendon enthesopathy is a chronic degenerative condition localized at the tendon–bone junction, most commonly at the inferior pole of the patella. This pathology develops as a result of repetitive tensile loading and microtrauma, leading to collagen disorganization, neovascularization, and impaired regenerative capacity of the tendon tissue. Clinically, patellar tendon enthesopathy manifests as persistent anterior knee pain, localized tenderness, and progressive limitation of physical

activity. The condition is particularly prevalent in athletes involved in jumping and sprinting sports, such as volleyball, basketball, football, and athletics [4].

The combined occurrence of lateral meniscus injury and patellar tendon enthesopathy presents a significant diagnostic and therapeutic challenge. Overlapping clinical symptoms, including pain, swelling, and functional limitation, may mask the underlying pathology and delay accurate diagnosis. Inadequate or delayed treatment may result in chronic knee pain, prolonged rehabilitation, decreased athletic performance, and an increased risk of early osteoarthritic changes [5].

Despite advances in imaging techniques and therapeutic modalities, the optimal management of athletes with combined intra-articular and periarticular knee pathologies remains insufficiently studied, particularly in regional clinical settings. Therefore, comprehensive evaluation of diagnostic approaches and treatment outcomes in this patient population is of considerable importance.

Aim of the study. The aim of this study was to improve diagnostic accuracy and evaluate the effectiveness of treatment strategies for lateral meniscus injuries of the knee joint combined with patellar tendon enthesopathy in athletes.

Materials and methods. The study was conducted between 2023 and 2025 at the Khorezm multidisciplinary medical center, department of traumatology and orthopedics. A total of 78 athletes aged 18–35 years were enrolled in the study. All participants were actively engaged in professional or semi-professional sports. Based on clinical and instrumental findings, patients were divided into three groups. The first group consisted of athletes with isolated lateral meniscus injury. The second one involved 24 athletes with isolated patellar tendon enthesopathy.

The third group included 22 athletes with combined lateral meniscus injury and patellar tendon enthesopathy. All patients underwent comprehensive clinical evaluation, including detailed medical history, assessment of pain intensity, joint stability, range of motion, and functional status. Instrumental diagnostic methods included: radiographic examination of the knee joint, ultrasonographic evaluation of the patellar tendon and its enthesis, magnetic resonance imaging (MRI) for detailed assessment of meniscal integrity and enthesopathic changes. Pain intensity was assessed using the visual analog scale (VAS), and knee function was evaluated using the Lysholm Knee Scoring Scale. Treatment was individualized depending on the type and severity of pathology. Conservative therapy included activity modification, nonsteroidal anti-inflammatory drugs, physiotherapy, therapeutic exercises, and extracorporeal shockwave therapy for patellar tendon enthesopathy. Surgical intervention, including arthroscopic partial meniscectomy or meniscal repair, was performed in patients with persistent mechanical symptoms or unstable meniscal tears. All patients underwent standardized postoperative or post-treatment rehabilitation.

Results. Clinical analysis revealed that mechanical symptoms such as joint locking and clicking were predominantly observed in athletes with lateral meniscus injuries, whereas localized anterior knee pain was more characteristic of patellar tendon enthesopathy. MRI findings confirmed lateral meniscus tears in all patients of the first group and third group and degenerative-enthesopathic changes of the patellar tendon in second and third groups. Following treatment, a statistically significant reduction in pain intensity was observed across all groups ($p < 0.05$). Functional outcomes improved substantially, with higher Lysholm scores noted at 6-month follow-up. The rate of return to full sports activity was highest in athletes with isolated pathology and slightly lower in those with combined lesions.

Discussion. Surgical intervention is indicated in cases of persistent pain, mechanical instability, or failure of conservative therapy. Arthroscopic meniscal repair or selective partial meniscectomy aims to restore joint congruency and prevent further cartilage degeneration. Preservation of meniscal tissue is of particular importance in athletes to minimize the risk of early-onset osteoarthritis. Postoperative rehabilitation, emphasizing neuromuscular control, proprioception, and progressive return to sport-specific activities, is essential for achieving optimal functional recovery.

In conclusion, the management of lateral meniscus injuries combined with patellar tendon enthesopathy in athletes should be individualized, based on the severity of structural damage, functional demands, and sport-specific load patterns. An integrated diagnostic and therapeutic strategy improves clinical outcomes, reduces recurrence rates, and facilitates a safe return to competitive sports.

Conclusions. Lateral meniscus injuries of the knee joint and patellar tendon enthesopathy are common and clinically significant conditions in athletes. Their combined occurrence complicates diagnosis and treatment and may adversely affect functional outcomes. The results of this study conducted at the Khorezm Multidisciplinary Medical Center demonstrate that comprehensive diagnostics and individualized treatment strategies significantly improve pain relief, functional recovery, and return to sports activity. Early diagnosis and an integrated therapeutic approach are essential for preventing chronic knee dysfunction and long-term degenerative changes.

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