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RESEARCH ARTICLE

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Sports Injury Management

Ektaben Soni

MPT Orthopaedics, Assistant Professor, Department of Musculoskeletal, Sardar Patel University, Arthritis Clinic, Vallabh Vidyanagar, Gujarat, India

ABSTRACT

Sports injuries are prevalent among athletes and can range from minor sprains and strains to severe fractures and ligament tears.

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Introduction

Sports injuries are prevalent among athletes and can range from minor sprains and strains to severe fractures and ligament tears. Understanding the mechanisms, risk factors, and treatment options for these injuries is crucial for effective management and prevention. This review will focus on common sports injuries, their diagnosis, and evidence-based treatment strategies.

Common Sports Injuries

Ankle Sprains

Ankle sprains are common and typically occur due to an inversion injury where the foot rolls inward, stretching or tearing the ligaments on the outside of the ankle. "Ankle sprains often result from an inversion injury where the foot rolls inward, causing ligamentous damage"[1-3]. The diagnosis is primarily clinical, using physical examination techniques such as the anterior drawer test and talar tilt test, supplemented by imaging like X-rays or MRI when necessary. "Physical examination, including the anterior drawer test and talar tilt test, alongside imaging like X-rays or MRI, helps confirm the diagnosis"[2, 4, 5]. Initial treatment follows the RICE protocol (Rest, Ice, Compression, Elevation), and evidence suggests that early mobilization and functional support, such as ankle braces, can reduce recovery time and recurrence rates. "Initial treatment with the RICE protocol, combined with early mobilization and functional support, is effective in reducing recovery time and recurrence"[3]. Studies have shown that functional rehabilitation, including balance and strength training, is essential for a full recovery. "Functional rehabilitation, including balance and strength training, is essential for complete recovery"[6].

Anterior Cruciate Ligament (ACL) Tears

ACL tears often result from non-contact injuries involving sudden deceleration, pivoting, or landing from a jump. "ACL tears commonly occur due to non-contact mechanisms like sudden deceleration or pivoting"[5, 7]. Diagnosis is confirmed through physical examination tests such as the Lachman test and pivot-shift test, along with MRI. "Diagnosis is confirmed through physical tests and MRI" [4]. Surgical reconstruction is the standard treatment, particularly for young, active individuals, with post-operative rehabilitation focusing on restoring range of motion, strength, and proprioception. "Surgical reconstruction followed by focused rehabilitation is recommended for young, active patients" [8]. Prehabilitation, or conditioning before surgery, has been shown to improve post-operative outcomes. "Prehabilitation improves post-operative outcomes in ACL reconstruction" [5]. Research indicates that early and aggressive rehabilitation protocols can significantly improve long-term outcomes and reduce the risk of re-injury.Early and aggressive rehabilitation protocols improve long-term outcomes and reduce re-injury risk [5, 9].

Rotator Cuff Injuries

Rotator cuff injuries, often seen in sports involving overhead activities, can lead to tendinitis or tears. "Overhead sports activities frequently cause rotator cuff injuries"[9, 10]. Diagnosis involves physical examination tests like the Neer test and Hawkins-Kennedy test, supplemented by ultrasound or MRI. "Tests such as Neer and Hawkins-Kennedy, along with imaging, are used for diagnosis" [9, 11]. Conservative management includes rest, anti-inflammatory medications, and physical therapy focusing on strengthening the rotator cuff and scapular stabilizers. "Conservative treatment involves rest, anti-inflammatory medication, and physical therapy" [12]. Surgical repair may be necessary for complete tears or cases not responding to conservative treatment, with evidence supporting early physical therapy to enhance recovery. "Surgical repair is indicated for complete tears, with early physical therapy enhancing recovery" [11, 13]. Studies have demonstrated that structured physical therapy programs can significantly reduce pain and improve function in patients with rotator cuff injuries. "Structured physical therapy programs reduce pain and improve function in rotator cuff injuries" [11, 14].

Tennis Elbow (Lateral Epicondylitis)

Tennis elbow is caused by repetitive stress and overuse of the extensor muscles of the forearm. "Repetitive stress and overuse of the extensor muscles lead to tennis elbow" [15]. Diagnosis is primarily clinical, using tests like the Cozen's test and Mill's test. "Clinical diagnosis is confirmed using Cozen's and Mill's tests"[16]. Treatment includes eccentric exercise programs, extracorporeal shockwave therapy (ESWT), and corticosteroid injections. "Eccentric exercise, ESWT, and corticosteroid injections are

Contact Ektaben Soni, MPT Orthopaedics, Assistant Professor, Department of Musculoskeletal, Sardar Patel University, Arthritis Clinic, Vallabh Vidyanagar, Gujarat, India.

effective treatments"[17]. Recent evidence suggests platelet-rich plasma (PRP) injections may provide long-term relief compared to corticosteroids. "PRP injections have shown superior long-term relief compared to corticosteroids" [15]. Research also indicates that combining PRP injections with physical therapy may enhance treatment outcomes. "Combining PRP injections with physical therapy enhances treatment outcomes" [18, 19].

Evidence-Based Treatment Strategies

Rehabilitation Protocols

Functional rehabilitation emphasizes early mobilization, proprioceptive training, and sport-specific exercises. "Functional rehabilitation focuses on early mobilization and sport-specific exercises". Studies indicate that functional rehabilitation can reduce recovery time and prevent re-injury in athletes with ankle sprains and ACL injuries. "Functional rehabilitation reduces recovery time and prevents re-injury" [20, 21]. Eccentric training is particularly effective for tendinopathies such as Achilles tendinitis and tennis elbow, promoting collagen remodeling and improving tendon strength. "Eccentric training is effective for tendinopathies by promoting collagen remodeling"[22]. Research supports the use of eccentric exercises in conjunction with other therapeutic modalities for optimal recovery. "Eccentric exercises in combination with other therapies optimize recovery" [23,24].

Biological Therapies

Platelet-rich plasma (PRP) injections have been investigated for various sports injuries, including tendinopathies and ligament injuries. "PRP injections are used for treating tendinopathies and ligament injuries" [25]. Meta-analyses suggest PRP can enhance healing by delivering growth factors that promote tissue repair and regeneration. "Meta-analyses show PRP enhances healing through growth factor delivery". Clinical trials have shown PRP to be particularly effective in accelerating the healing process and reducing pain in chronic tendinopathies. "Clinical trials show PRP accelerates healing and reduces pain in chronic tendinopathies" [26].

Surgical Interventions

Arthroscopic surgery, a minimally invasive technique for injuries like rotator cuff tears and meniscal injuries, allows for quicker recovery and less post-operative pain compared to open surgery. "Arthroscopic surgery offers quicker recovery and less post-operative pain" [27]. For severe injuries like ACL tears, ligament reconstruction using autografts or allografts is the standard of care, with positive outcomes and high rates of return to sport, contingent on adherence to rehabilitation protocols. "Ligament reconstruction with autografts or allografts is effective for severe ACL tears"[28, 29]. Studies have demonstrated that patient adherence to post-surgical rehabilitation is crucial for achieving optimal functional outcomes. "Patient adherence to post-surgical rehabilitation is crucial for optimal outcomes"[26, 29].

Conclusion

Sports injuries require a comprehensive approach to diagnosis and treatment, integrating clinical examination, imaging, and evidence-based rehabilitation and surgical techniques. "Comprehensive management of sports injuries integrates clinical examination, imaging, and evidence-based treatments"[30]. Ongoing research continues to refine these strategies, enhancing recovery and performance outcomes for athletes. "Continuous research is essential to refine treatment strategies and improve outcomes"[31].

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