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The Athelete's Nightmare: A Comprehensive Review of Quadriceps Contusion Grading and Rehabilitation Strategies: A Scoping Review

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ABSTRACT

Among the most prevalent catastrophic injuries in contact sports are quadriceps contusions, which can result in functional impairment, extended playtime absences, and possible long-term complications like myositis ossificans. To maximise recovery, reduce recurrence, and guarantee a safe return to sports, accurate grading and prompt rehabilitation are essential. However, evidence-based clinical decision-making is impeded by variations in grading schemes and rehabilitation procedures.

This review aimed to synthesise existing literature, providing a practical assessment of the strengths and weaknesses of current systems for grading and managing quadriceps muscle injuries.

A scoping review of 24 peer-reviewed studies were conducted using databases including PubMed, Scopus, and Google Scholar from 2015 to 2025. Relevance, methodological accuracy, and clinical outcomes were the criteria used to screen the studies. To compare grading standards, diagnostic methods, and rehabilitation frameworks, data were thematically synthesised.

Three main grading schemes were identified by analysis: hybrid classifications, imaging-assisted (MRI, ultrasound), and clinical severity-based. Considering that it is accessible, clinical grading is still the most popular method, but in more serious cases, imaging improves diagnostic accuracy. Early pain management, progressive strengthening, gradual range-of-motion exercises, and sport-specific drills were all consistently emphasised in rehabilitation strategies. Adjunct modalities like cryotherapy, neuromuscular stimulation, and blood fl ow restriction training has been shown to improve recovery in recent studies.

Athletic performance is still significantly hampered by quadriceps contusions, and clinical results are impacted by inconsistent grading and rehabilitation techniques. Even though multimodal, progressive rehabilitation produces positive outcomes, there is an urgent need for agreement on evidence-based grading and protocol standardisation. To maximise athlete recovery and return-to-sport timelines, future research should concentrate on high-quality trials combining objective biomarkers, cutting-edge therapeutic modalities, and advanced imaging.

Keywords: Muscle injury grading, Return-to-sport, Sports injury

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