

Dorsal lunate dislocation following a routine pickleball swing: A case report

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Abstract

Pickleball has gained substantial popularity across diverse age groups, and the increasing number of participants has been accompanied by more frequently reported injuries. Upper extremity conditions related to pickleball range from overuse tendinitis to fractures after falls. More serious injuries, including wrist fractures and dislocations, are typically associated with significant trauma. We present the case of a recreational pickleball player who sustained a dorsal lunate dislocation during a routine paddle swing, without a fall or direct impact. The injury was recognized after a delay, ultimately requiring treatment with a salvage procedure.

Keywords: pickleball, perilunate injury, lunate dislocation

Introduction

Dorsal lunate dislocation is a rare injury that results from disruption of the intercarpal and radiocarpal ligaments. In the Mayfield classification, lunate dislocation represents a later stage in the progression of perilunate injuries and is generally associated with substantial force [1]. In pickleball, the presumed mechanism would most commonly involve a fall onto an outstretched hand. The rarity of this injury pattern likely contributes to delayed diagnosis, and traumatic lunate dislocation is reported to be missed at initial assessment in a considerable proportion of cases [2]. Recognition is clinically important because the wrist is among the most frequently injured anatomic locations in pickleball [3, 4].

In this case report, a middle-aged recreational pickleball player sustained a dorsal lunate dislocation during a routine swing, without an associated fall or direct impact. A six-week delay in recognition resulted in the need for a salvage operation.

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Informed Consent

Written informed consent was obtained from the patient for publication of this case report and all accompanying images.

Conflict of Interest

No conflict of interest was declared by the authors.

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Case presentation

A 63-year-old left-hand-dominant recreational pickleball player developed sudden, severe pain in the left wrist while swinging to return a serve. The pain was immediate and prompted him to stop playing. Despite rest and icing, symptoms persisted, and he was evaluated by a local physician. He was diagnosed with a wrist sprain and treated with anti-inflammatory medication. Because his symptoms did not improve, he presented to our orthopedic office five weeks after symptom onset.

His primary complaint was persistent throbbing pain with limited mobility, which led him to avoid using the left hand. He was particularly concerned about impaired ability to write, which affected his work as an attorney. He reported no prior injury or underlying wrist problems, including inflammatory conditions.

Physical examination demonstrated limited wrist extension and flexion, with full forearm supination and pronation. Goniometer measurements showed extension limited to 10 degrees and flexion to 30 degrees. There was no clinical evidence of generalized ligamentous laxity in the upper extremities. A tender dorsal bony prominence was apparent over the wrist. Digital range of motion was full, and the neurovascular examination was intact. Guarding was noted during attempted radial stress testing and weight-bearing maneuvers.

A dorsal lunate dislocation was suspected and confirmed on radiographs (Figure 1). Magnetic resonance imaging demonstrated complete tears of the scapholunate and lunotriquetral ligaments. Localized bone bruising was present without evidence of fracture.

Given the chronicity of the injury, primary reduction and ligament repair were considered unlikely to yield a satisfactory outcome. The patient therefore underwent proximal row carpectomy. Postoperative management included several months of formal physical therapy. At the final follow-up 6 months after surgery, he reported good functional recovery and return to activities of daily living. Goniometer measurements showed wrist extension of 60 degrees and flexion of 40 degrees, which were nearly equivalent to the contralateral side. Final radiographs demonstrated a well-maintained radiocapitate articulation (Figure 2). The patient intended to return to recreational pickleball.

Figure 1. Preoperative radiographs (anteroposterior and lateral views).



Figure 2. Six-month postoperative radiographs after proximal row carpectomy.



Discussion

Pickleball participation has increased markedly, with a parallel rise in sports-related injuries. Using National Electronic Injury Surveillance System data, Forrester reported that pickleball injuries involved the lower extremity in 32% and the upper extremity in 25.4% of cases [5]. Wrist injuries in pickleball have been reported at an incidence of 13.2% [3]. Recent reports emphasize that severe wrist injuries in pickleball are most commonly associated with a fall onto an outstretched hand, often resulting in distal radius fractures [6]. To our knowledge, dorsal lunate dislocation has not previously been reported as a pickleball-related injury.

Dorsal lunate dislocation is typically associated with high-energy trauma and is generally considered a Mayfield stage IV injury, reflecting severe carpal disruption [1]. Because this injury is uncommon, it may be overlooked during initial evaluation. Prior work suggests that approximately 25% of lunate dislocations are initially misdiagnosed, leading to treatment delays [2, 7].

In the present case, the absence of a perceived traumatic event contributed to an initial diagnosis of wrist sprain, followed by a six-week delay before definitive management. In acute and selected subacute settings, lunate reduction with primary ligamentous repair is generally recommended. With delayed presentation, salvage procedures such as proximal row carpectomy are more commonly considered. After discussion of treatment options, proximal row carpectomy was performed. Beyond chronic settings, this procedure may also be appropriate in acute cases complicated by vascular compromise and extensive ligamentous disruption [8, 9].

This case expands awareness of a potentially overlooked injury pattern in pickleball and raises questions regarding injury

mechanisms for dorsal lunate dislocation. Mayfield proposed that perilunate injuries occur because of force applied to a hyperextended wrist in ulnar deviation and intercarpal supination [1]. A reverse mechanism has also been described, in which injury progression occurs from the ulnar to the radial direction, producing a volar intercalated segmental instability pattern as an extended wrist undergoes intercarpal pronation [10]. Although dorsal lunate dislocation is generally attributed to high-energy trauma, isolated cases have been reported after comparatively minor mechanisms. Siddiqui and Sarkar described an isolated dorsal lunate dislocation after a sudden traction force when a dog pulled a patient's wrist, which they characterized as a trivial mechanism; that case was recognized early and treated with closed reduction and percutaneous pinning [11].

In the present case, given the lack of direct impact, it is plausible that an overzealous swing taking the wrist through a rapid extension-to-flexion arc contributed to the injury. Biomechanically, the pickleball paddle functions as a lever arm during the swing, with the wrist serving as a fulcrum and potentially amplifying forces across the carpus. Technique recommendations commonly emphasize maintaining a rigid wrist at ball contact to improve control [12]. Awareness of this potential injury may therefore be relevant not only for clinicians but also for coaches and players.

Sports participation can lead to clinically significant injuries, and timely diagnosis is critical for prompt treatment. This report describes a rare but consequential dorsal lunate dislocation that occurred during a routine pickleball swing and was recognized late, requiring a salvage procedure. Although proximal row carpectomy may still have been an appropriate treatment choice even with earlier presentation, delayed diagnosis prolonged pain and functional limitation until surgery. As pickleball is widely perceived as a low-impact sport and is particularly popular among recreational and older individuals, clinicians should remain vigilant for serious wrist injuries even after seemingly minor mechanisms.

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