

CASE REPORT

Triangular Fibrocartilage Complex Injury in Professional Cricketers

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ABSTRACT

Triangular fibrocartilage complex (TFCC) is a complex of multiple ligaments and cartilages at the ulnar end of the wrist. Injury of TFCC is commonly seen in sportsmen such as tennis players, cricketers, golfers and gymnasts. The typical presentation is pain radiating along the ulnar side of the hand, and is often accompanied by fracture of the ulnar styloid. Despite being a common injury, its knowledge remains largely unknown. This leads to a huge number of cases remaining undiagnosed and thus untreated and unreported. The authors report a TFCC injury in a professional Cricketer in an attempt to create awareness of this common sports injury.

Keywords: Injury, Professional cricket injuries, Sports injuries, Triangular fibrocartilage complex.

How to cite this article: Talib U, Saleem S. Triangular Fibrocartilage Complex Injury in Professional Cricketers. *J Postgrad Med Edu Res* 2015;49(4):204-208.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

The triangular fibrocartilage complex (TFCC) suspends the ends of the radius and ulna bones over the wrist.¹ As the name suggests, it is triangular in shape, which sits between the ulna and two carpal bones lunate and triquetrum.

It comprises of the articular cartilage, volar and dorsal radioulnar ligaments, meniscus homologue, ulnolunate and ulnotriquetral ligaments and the sheath of extensor carpi ulnaris muscle.² Triangular fibrocartilage complex stabilizes the distal radioulnar joint and is responsible for the diversity of movements the wrist is capable of. It is demonstrated that degeneration of the TFCC begins in the third decade of life and progressively increases in frequency and severity in subsequent decades. Traumatic injuries of TFCC are commonly seen in sportsmen, such as tennis players, cricketers and gymnasts.

Injury to the TFCC is not commonly reported in cricket. Triangular fibrocartilage complex injuries of the wrist affect the ulnar side of the wrist. Mild injuries of the TFCC may be referred to as a wrist sprain. However, the soft tissues of the wrist are complex and disruption of this area through injury or degeneration can cause more debilitating symptoms. A TFCC injury can be a very disabling wrist condition. The typical presentation is pain radiating along the ulnar side of the hand, or diffuse pain with possible inability to rotate arm in case it is accompanied by fracture of the ulnar styloid.

In order to compliment already existing literature on TFCC, the authors report a case of TFCC to increase the awareness regarding the diagnosis and treatment of this injury often left undiagnosed and thus under reported in sports medicine setting.

CASE REPORT

A 27-year-old male presented to the OPD department with a 2-week history of pain in the wrist radiating to the ulnar side of the hand and muscle weakness and numbness in the domain of the ulnar nerve. The patient is a right-handed batsman. He was in his usual state of health 2 weeks back when during a cricket match he dived on the outstretched hands while fielding. His wrist went into hyperextension and ulnar deviation, he experienced slight pain but ignored the injury and continued to play. Later that day, on playing a shot that involved flexion and medial rotation of the wrist he experienced pain in his wrist and hand. The pain was severe in nature, involved the medial side of the left wrist and the 4th and 5th digits and radiated to the ulnar side of the hand and wrist. The pain aggravated on trying to pick something from the pocket, on stretching the fingers involved and on movements that required loading a hyperextended wrists. It also aggravated on extending the wrist from a maximally flexed position and upon load bearing. The pain relieved with soaking in hot water, upon taking pain medications and on stabilizing the wrist with a splint. The pain was associated with weakness and numbness on the medial two fingers in the domain of the ulnar nerve. He was advised rest for 2 weeks with pain control and splint to provide stabilizing support. After 2 weeks, the patient resumed his sporting activities. On playing the

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very first ball during the match, he experienced the same pain and could not continue to play after which he was taken back to the hospital. Given his history and physical exam, a suspicion of injury to TFCC and fracture of hook of hamate was considered the most likely diagnosis.

Other possible diagnoses were ulnar impaction syndrome, fracture, arthritis, dorsal ulnar cutaneous nerve neuritis, ulnar artery thrombosis, interosseous ligament injury, distal radioulnar joint (DRUJ) instability and extensor carpi ulnaris (ECU) pathology.³

X-ray of the wrist (Figs 1A to C) was performed that revealed increased linear sclerosis through hamate bone likely representative of healed fracture. A magnetic resonance imaging (MRI) (Figs 2A to C) was then performed that revealed minimal silverying of the fluid along the prestyloid recess and associated swelling of the ulnotriquetral ligament that confirmed the suspicion of a TFCC. Technetium 99 radiotracer uptake bone scan (Figs 3A and B) revealed findings of uptake in the lateral carpal bones of the left hand, in the known fracture seen on MRI.

TREATMENT PROTOCOL

The player was advised to use wrist support and complete hand rest for 2 weeks. The patient was followed up in the OPD and showed significant recovery. There was marked improvement in pain over this time period. This was followed by physical rehabilitation that involved strengthening exercises for the hand muscles. He was advised to start shadow batting for gradual strengthening of muscles and ligaments and to start loading the muscles to return to play. He continued his other fitness exercises during this course. As his rehabilitation progressed, he started batting practice with rubber balls. A thorough examination was performed on subsequent follow-up visits. The fracture had healed with no tenderness on

the previously tender site. The wrist movements were intact except for some residual weakness of the 4th and 5th digits on flexion which was due to disuse and was improving with exercises prescribed. Load placement on the TFCC while doing the stress test did not incite pain showing the extent of recovery. The player returned to play and has been playing without any discomfort or pain ever since.

DISCUSSION

Triangular fibrocartilage complex remains a common sports injury, affecting sportsmen in multiple settings and presenting with in the wrist and along the medial side of the arm. Tears in the periphery of the TFCC may have sufficient blood supply and thus can be repaired. However, tears in the center and along the radial attachment do not have immediate access to a blood supply and are not likely to heal as quickly and as efficiently.⁴ While examining the TFCC the physician relies on the history, symptoms, and physical examination to make the diagnosis. Tests of joint stability are conducted. Special tests, such as stress testing of the wrist radioulnar and ulnocarpal joints, help define specific areas of injury. The stress testing in our case showed pain typical to the TFCC injury as described in the text. An accurate diagnosis and grading of the injuries is important. Usually, the grade is based on how much disruption of the ligament has occurred. There are two basic grades of triangular fibrocartilage complex injuries. Class 1 is for traumatic injuries. Class 2 is used to describe degenerative conditions.⁵

Other tests may be done to provoke the symptoms and test for excess movement. These include hyper-supination and loading the wrist in a position of ulnar deviation (moving hand away from the thumb) and wrist extension. Loading the wrist caused pain. The fovea

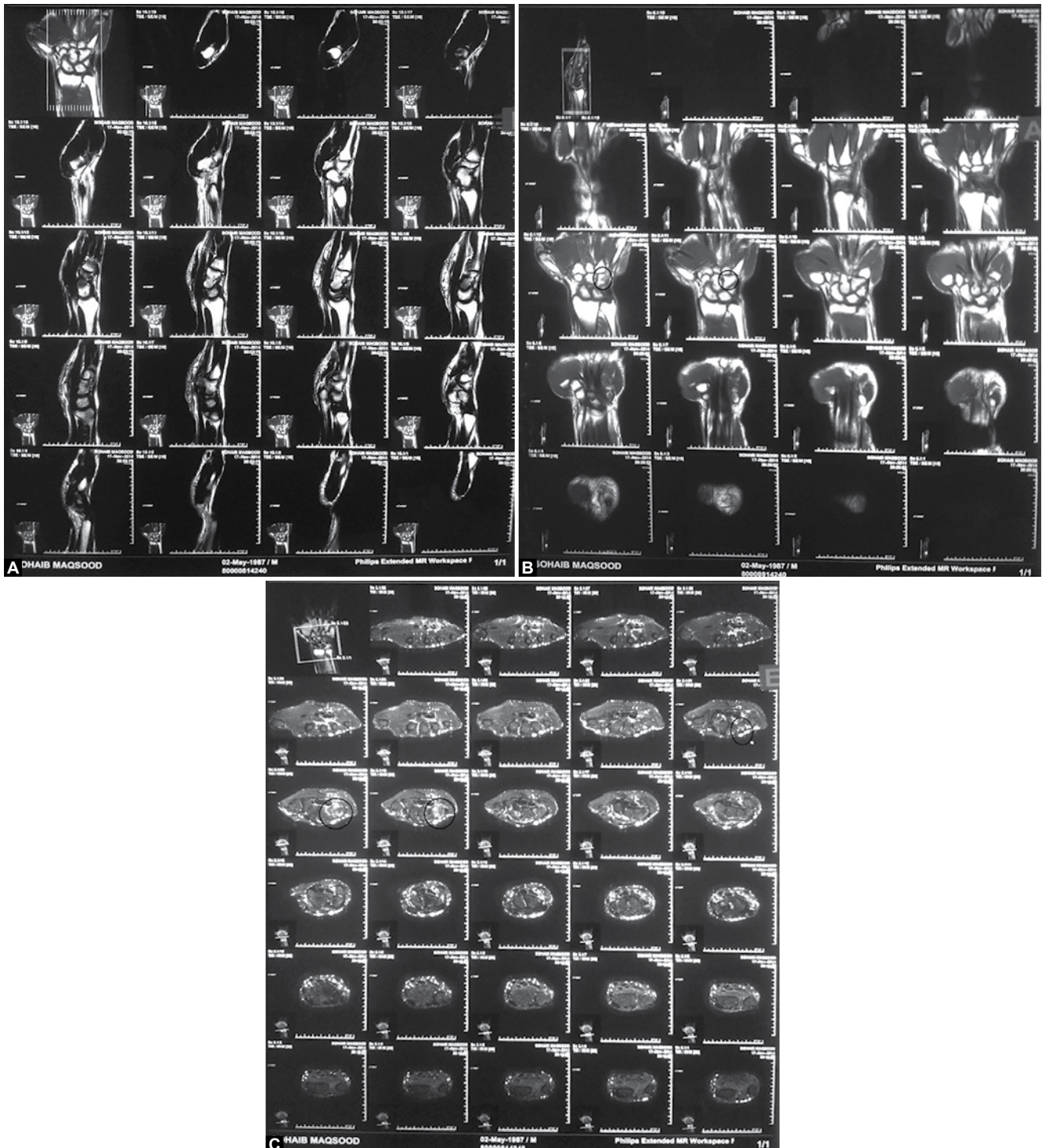


Figs 1A to C: X-ray of the wrist

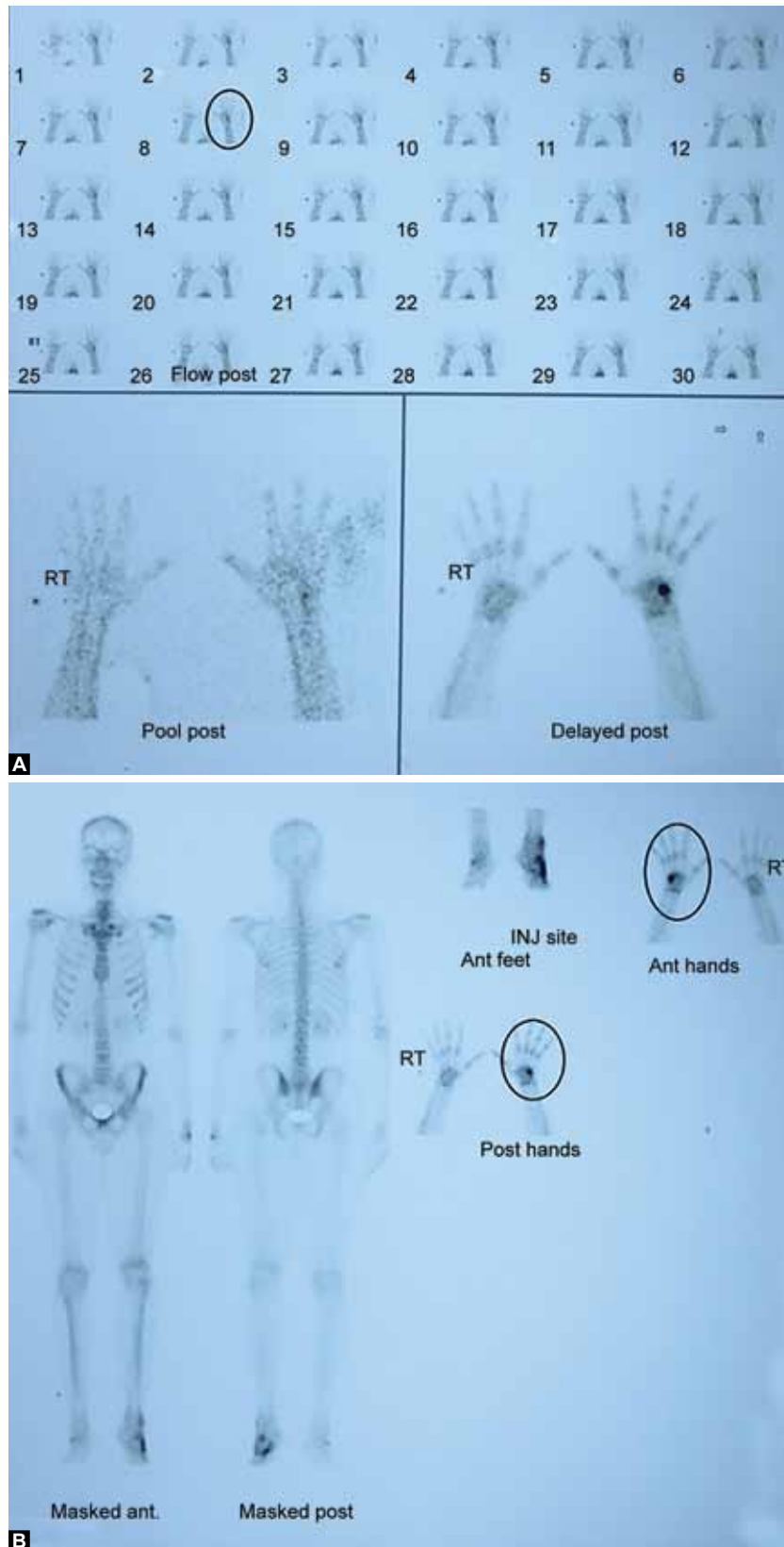
test applies external pressure to the area of the fovea. It involves comparing the involved wrist with the wrist on the other side. Tenderness and pain during this test is a sign that there is a split-tear injury. Such tears are more common with lower energy, repetitive torque injuries such as from bowling or golf. The fovea test was negative showing absence of a tear, thus ruling out the presence of a more severe injury.

Imaging remains the most important modality for the definitive diagnosis of TFCC. X-rays may show disruption

of the triangular fibrocartilage complex when there is a bone fracture present. Ligamentous instability without bone fracture appears normal on standard X-rays. Increased linear sclerosis as shown by the X-rays in the above-mentioned case showed healed fracture. Arthrography, which is performed by injecting a dye into the joint space tests three specific joint areas. A diagnosis of TFCC is made if the dye leaks into any of the joints. Acute injuries can be painfully swollen impeding a thorough examination. In such cases, more advanced imaging, such



Figs 2A to C: Magnetic resonance imaging



Figs 3A and B: Bone scan

as MRI, can be used to detect ligamentous or other soft tissue damage. An MRI in this case showed silverying of the fluid along the prestyloid recess associated swelling of the ulnotriquetral ligament which represented sprain, it also confirmed the fracture of hook of hamate with an

abnormal signal associated with residual bone edema. Magnetic resonance imaging arthrogram can also be performed by injecting a dye into the joint space to look for any leaks. However, studies show that almost half the patients with a true TFCC tear have normal arthrograms.

Wrist arthroscopy is the most accurate test to assess the severity of damage as it allows direct visualization of the joint space. At the same time, the surgeon looks for other associated injuries of ligaments and cartilage. This also has the advantage that any associated anomaly that is visualized can be treated at the same time.⁶

If left untreated or improperly treated, TFCC may become recurrent, leading to persistent pain, stiffness and weakness at the wrist as important complications. Operative intervention is undertaken when conservative management has failed, there is instability (abnormal motion) at the DRUJ or there is a pull-off fracture of the TFCC with displaced wrist fracture. Arthroscopy is the preferred surgery through a keyhole, though open repair may be required in case of complex tears. Operative complications following TFCC repair include infection, injury to nerve or tendons around the operative site, incomplete relief of symptoms and in a few cases reflex sympathetic dystrophy (painful stiff hands).

CONCLUSION

There is lack of awareness among health care professionals about TFCC injury, especially in sports medicine settings. Although rare, but once a diagnosis is made, immediate therapy should be initiated with gradual and

planned rehabilitation to ensure complete recovery and to avoid unwanted prolongation of the injury hindering normal movements and to resist other unwanted complications including TFCC degeneration.⁷

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