

## Case Report

# An Unusual Case of Triangular Fibrocartilage Complex Tear after a Wrist-Lock Restraint

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## INTRODUCTION

We describe an unusual case of a triangular fibrocartilage tear after a wrist-lock manoeuvre in a police officer. The case highlights the possibility of injury with this wrist position and the importance of wrist arthroscopy in a patient with an unusual history.

The 'Wrist-lock' manoeuvre (Figure 1) was originally used in Martial Arts to restrain an opponent. It was both simple to apply and highly effective. As a consequence it has been adopted by the police. The manoeuvre involves a forceful hyperflexion of the wrist and forearm pronation. Complications are rare however distal radial fractures have been described in children [1]. This case illustrates the presentation of distal ulna wrist pain following the manoeuvre and the subsequent diagnosis of a triangular fibrocartilage complex (TFCC) tear.

## CASE REPORT

A 51 year old, Police Training Officer was referred to the hand surgeons with a painful right wrist after his colleague preformed a wrist-lock on him during training. He described the wrist being forcibly flexed and afterwards pain in the wrist, which did not, subside. He attended Accident and Emergency the day of the injury where the wrist was examined; no swelling or bruising was noted. Tenderness was localised over the distal ulna and ulna deviation of the wrist elicited pain. Radiographs were normal. After a course of physiotherapy he was referred by his GP with ongoing distal ulna pain, unable to return to full activities. Clinically seven months after injury his wrist appeared similar compared to the left. No tenderness was identified on palpation, but pain was reproduced at the ulnocarpal joint on passive ulna deviation and end range pronation and supination action.

Repeat radiographs of the wrist remained normal. MRI of the wrist (Figure 2), identified an effusion in the distal radioulnar joint (DRUJ), suggestive of a TFCC tear. A wrist arthroscopy was then performed. Intraoperative pictures illustrated a central, Class 1a TFCC tear [2], (Figure 3). The tear was debrided arthroscopically with no complications. He returned to clinic 2 weeks post operatively well with healed wounds, taking no analgesia. At 3 months follow-up his distal ulna wrist pain had resolved and he was regaining wrist movements and strength

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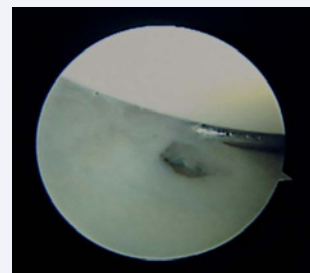
- Triangular fibro cartilage tear
- Wrist-lock



**Figure 1** Illustration of wrist lock manoeuvre.



**Figure 2** MRI scan showing fluid around the TFCC and DRUJ, suggestive of a TFCC tear.



**Figure 3** Arthroscopy of the wrist, demonstrating the central TFCC tear.

with the aid of hand therapy. At 2 years post-surgery he remained symptom free and had returned to his usual activities, with Patient Evaluation Measure [3] of 10/5/4 and no restrictions in movement.

## DISCUSSION

The TFCC is well described [4] and is integral to normal movement of the DRUJ, with biomechanical studies showing the importance of the TFCC ligaments in stabilising the DRUJ and the articular disc which acts as a shock absorber transmitting compressive loads between the ulna and carpus (triquetrum/lunate). It can be injured by a fall onto an extended wrist or by an axial force applied to the ulnar border of the wrist [2]. Besides traumatic tears, degenerative TFCC tears can occur, mainly due to loading through the ulnocarpal joint over time and natural degeneration [2]. These tears present with gradually increasing pain over a period of time, which is different to that described in our case.

The wrist lock manoeuvre involves the elbow being extended, the forearm pronated and the wrist forcefully hyperflexed and ulna deviated (Figure 1). During application of an axial load to the forearm with a neutral wrist position 20 % of the force is transferred to the ulnocarpal joint via the TFCC [4]. The wrist lock position would squeeze the TFCC disc between the ulna head and carpus, increasing the force through the disc. This is confirmed on cadaveric studies that have shown that load transfer through the wrist is affected by wrist position, with forces of 150% measured when the wrist is in ulna deviation and pronation; the wrist lock position. Further, the position of wrist lock would have had the volar radioulnar ligaments of the TFCC in maximum tension [4]. Combining this with an axial force and compression of the TFCC disc was sufficient in the patient to overcome the TFCC's elastic limit and cause failure and tear. We are not aware of TFCC injury being described following the application of the wrist lock manoeuvre; an unusual injury.

Symptomatically most patients with central TFCC tears complain of ulnar sided wrist pain especially on resisted forearm pronation. Clinically point tenderness is elicited when between the triquetrum and ulna styloid and pain is commonly reproduced on ulna deviation. Radiographs are frequently normal. MRI and arthrogram have been shown to have a greater sensitivity, yet wrist arthroscopy remains the most accurate method of diagnosis.

The central TFCC tear, as seen in this case, can be degenerative in origin, however this man gave a clear history with symptoms starting after the manoeuvre. Further the biomechanical studies show that this position puts significant stress on the TFCC. This clinical case highlights the importance of clinical suspicion of TFCC injury despite an unusual history. The role of wrist arthroscopy is also important in diagnosing and treating TFCC tears. The early diagnosis and treatment of acute TFCC injuries is essential to prevent the development of chronic symptoms [5]. This patient's symptoms resolved and he remained painfree at 2 years after arthroscopic debridement of the central TFCC tear.

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