Middle Finger Metacarpophalangeal Joint Locked in Flexion Caused by Entrapped Ulnar Collateral Ligament

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Case Report

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Type 1 finger metacarpophalangeal (MCP) joint locking is characterized by maintained flexion of the MCP, with a lack of active and passive extension. Metacarpophalangeal joint locking is rare but has several identified causes, most commonly involving a radial-sided osteophyte. We report a case of right middle finger ulnar collateral ligament (UCL) entrapment characterized as type 1 MCP joint locking. The physical examination demonstrated that the right middle finger was locked in flexion at 60° at the MCP joint. Magnetic resonance imaging (MRI) demonstrated a possible tear of the distal attachment of the UCL at the MCP joint. Closed manipulation was unsuccessful in the office, and the patient underwent UCL ulnar osteophyte excision with full postoperative recovery. Although diagnosing the cause of UCL locking may be complicated by the lack of evidence in imaging studies, patients can return to full function by restoring the integrity of the joint with surgical treatment.

Case

A 61-year-old woman presented to the office complaining of having 1 day of persistent locking of the right middle finger after washing dishes. The patient reported that she previously had 2 episodes of locking within the past several months, which were resolved by vigorously shaking her hands. The patient denied any significant pain, numbness, or tingling at the time of initial locking and upon presentation to the office. Her physical examination revealed that her right middle finger was locked in flexion at 60° at the MCP joint (Fig. 1). Her sensation was intact, and the flexor...
digitotum superficialis and flexor digitorum profundus were intact from her index to little fingers bilaterally. There was no subluxation of the sagittal band, the extensor tendons were intact, and the central slip was intact.

X-rays were interpreted as normal by the radiologist and hand surgeon (Fig. 2). An in-office reduction under local anesthesia with ultrasound guidance was unsuccessful, and an MRI was ordered. Her MRI demonstrated a possible tear of the distal attachment of the ulnar collateral ligament (UCL) at the MCP joint (Fig. 3). The MRI results were discussed with the patient, and a right middle finger MCP joint ligament release with probable partial osteotomy of the proximal phalanx and metacarpal was scheduled. A midline dorsal surgical approach was made over the middle finger MCP joint and was bluntly dissected to reveal the extensor mechanism. The sagittal band was retracted distally, and the extensor mechanism was retracted radially. Intraoperatively, it was discovered that the UCL was intact. The volar was entrapped to a prominent osteophyte at the border of the metacarpal head on the ulnar aspect of the middle finger metacarpal (Fig. 4). The ligament would engage and become entrapped in maximum flexion and would disengage when the collateral ligament was pulled in the ulnar direction. The osteophyte was resected, and the passive range of motion was tested to ensure the locking had been alleviated.

The patient was re-evaluated 1 week later in the outpatient setting and was able to make a full fist with minimal pain. At the 6- and 12-week follow-ups, the patient had full range of motion, no pain, and returned to performing normal daily activities. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Discussion

Metacarpophalangeal joint locking is rarely documented in the literature, especially with respect to locking secondary to UCL entrapment. The diagnosis of MCP joint locking should first be differentiated from the diagnosis of trigger finger based on the involvement of the interphalangeal joints. Type 1 MCP joint locking is characterized by the inability of the patient to extend the finger both actively and passively. However, the patient often has maintained flexion from the point of locking.
Treatment of MCP joint locking has remained variable in the current literature. The consensus of the most recent case reports and literature reviews recommends attempted closed reduction with local anesthesia while avoiding aggressive motion to prevent fracture. Some cases have seen success with closed reduction, whereas most necessitate surgical intervention.\textsuperscript{1,4,6,7}

Although x-rays and MRI studies can be difficult to interpret in cases of MCP joint locking, another imaging modality could be used in the future. Jiang et al\textsuperscript{8} described the use of superb microvascular ultrasonography to visualize radial collateral ligament entrapment in a case of MCP joint locking. Superb microvascular imaging is a low-cost method that has been widely available since 2014 as an imaging sequence on the Xario 200, Aplio i-series, and Aplio Platinum series ultrasound technologies. This ultrasound technique works by reducing motion artifact with higher frame rates and resolution to visualize vasculature that would normally not be differentiated on Doppler ultrasound.\textsuperscript{10} The ability to visualize hyperemia and tendon quality may aid in the diagnostic process of these injuries in the future by differentiating between acute and chronic injuries. The use of superb microvascular imaging may also help decrease costs compared with using MRI.\textsuperscript{9}

More often, the cause of MCP joint locking is a radial-sided osteophyte of the metacarpal head. Our case was unique in that our patient had an ulnar-sided osteophyte. In our case, her x-ray findings were normal, with MRI findings suggesting a possible tear of the collateral ligament. By surgically exploring the MCP joint, it was determined that an ulnar-sided osteophyte was the cause of the patient’s persistent locking. When the passive range of motion was tested, the UCL would only disengage when pulled in the ulnar direction. Perhaps this can be considered in the future when attempting a closed reduction in the outpatient setting. Combined with the use of superb microvascular imaging, manual attempts of reduction could potentially be more successful by disengaging the ligament off the bone with the pathology in view. Our patient did well after the osteophyte was surgically excised and reported no pain, paresthesia, or range of motion deficits 3 months postoperatively.

Despite the possible risk of fracture, we believe that closed reduction in an outpatient setting is a reasonable treatment option before surgical intervention that could be improved in the future with the addition of superb microvascular imaging. However, open surgical treatment has traditionally been the most often used, with a high success rate. By reporting on our case of ulnar-sided osteophyte with surgical excision, we hope to raise awareness of this condition and contribute to the literature.

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