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Case Report

Metacarpal Neck Osteochondroma: An Atypical Cause of “Trigger Finger”

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“Locking” of the digits is a relatively common patient complaint in hand surgery. Typically, this phenomenon arises from either triggering of tendons at the A1 pulley or subluxation of tendons around the metacarpal head. Although trigger digit and sagittal band injury comprise most diagnoses, clinicians must be aware of rarer entities that alter the underlying osseous anatomy and predispose the digits to “locking.” Here, we present a case of metacarpal neck osteochondroma causing subluxation of the index metacarpophalangeal joint radial collateral ligament.

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“Snapping” and “locking” of the fingers or thumb are common clinical complaints for hand surgeons. Although most cases are attributable to common conditions, such as stenosing tenosynovitis, Dupuytren contracture, metacarpophalangeal (MCP) joint sprains, or arthritis, several comorbidities and pathologies are important influencers to consider when building a differential diagnosis. Comorbidities, such as diabetes mellitus, rheumatoid arthritis, and systemic protein depositing conditions like amyloidosis can increase the risk of “locking” of digits, especially stenosing tenosynovitis. During history gathering and physical examination, certain signs are reflective of unique pathologic causes. However, other autoimmune or oncologic processes may also affect the soft tissue or osseous structures around the MCP joints, eventually leading patients to a hand surgeon’s clinic. We present an uncommon case of MCP joint locking in the setting of a previously undiagnosed metacarpal neck osteochondroma. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Case

A 36-year-old otherwise healthy right-handed male nurse presented to clinic with complaints of painful locking of his right index finger for 2 weeks. He denied any recent trauma. Since the onset of his symptoms, he noticed pain on the radial aspect of the MCP joint, as well as a subjective feeling of his index finger being “locked” in a position of flexion. When attempting to passively extend his index finger, he felt a painful snap that he could easily reproduce. Prior attempts to relieve symptoms with anti-inflammatory medication and via activity modification were unsuccessful.

On physical examination, he exhibited full composite digital motion and the finger was neurovascularly intact. A painful “pop” accompanied by gentle catching was elicited on the radial aspect of the MCP joint when extending the digit from a flexed position (Video 1, available online on the *Journal’s* website at www.jhandsurg.org). Notably, the catching occurred near terminal extension, at approximately 20° of the proximal interphalangeal (PIP) joint flexion. This was in contrast with catching from routine trigger digit, which typically occurs when the PIP joints approach 90° flexion. There was no tenderness, palpable nodule, nor evidence of crepitus/triggering at or near the A1 pulley region. There was no evidence of extensor tendon subluxation.

Preoperative radiographs and computed tomography were pursued to aid in diagnosis and localization of the source of obstruction. The imaging was remarkable for a large bony protuberance off the radial aspect of the metacarpal neck (Fig. 1). This mass measured approximately 8 × 7 × 10 mm in size and was

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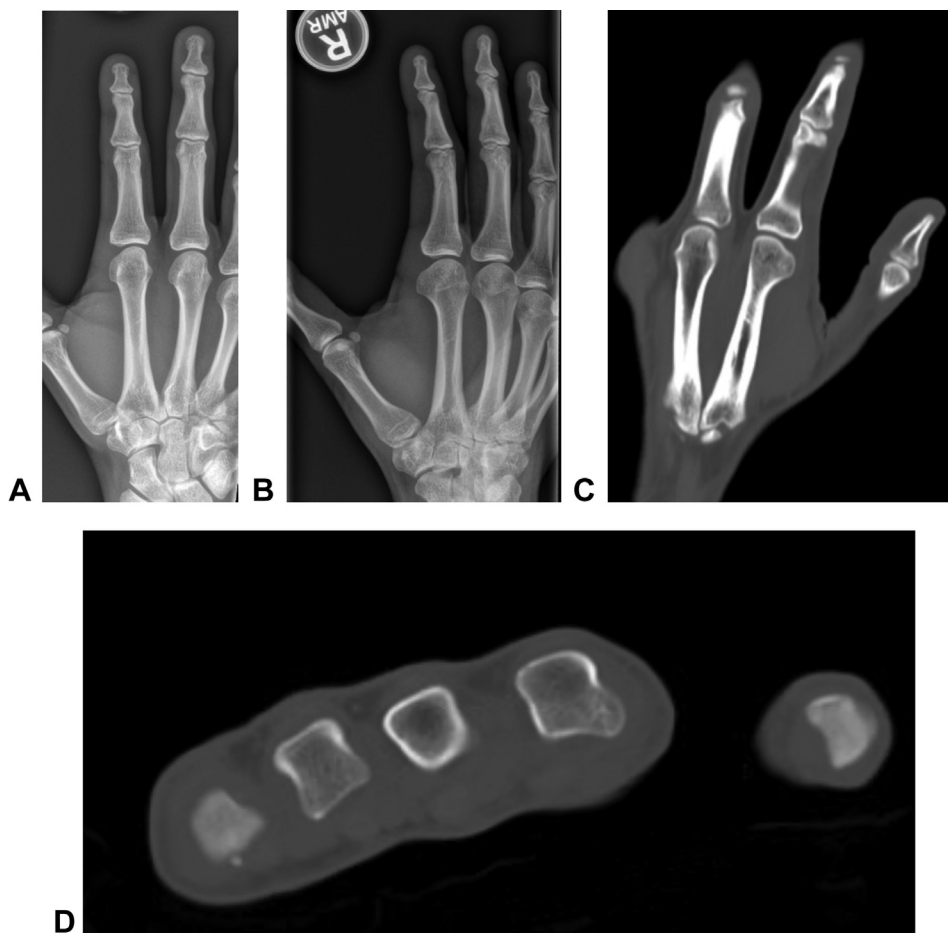


Figure 1. A and B Preoperative posteroanterior and oblique radiographs. C and D coronal and axial computed tomography scans demonstrating 8 × 7 × 10 mm osseous mass projecting from the radial aspect of the index metacarpal neck.

continuous with metaphyseal cancellous bone in the metacarpal neck.

Given the constellation of physical examination findings, the decision was made to pursue excisional biopsy with possible radial collateral ligament (RCL) repair. The patient was then taken to the operating room. Antibiotics were held until the mass was excised. An incision was made along the glabrous, non-glabrous junction at the radial aspect of the index MCP joint. Sharp dissection was performed to the level of the fascia with care taken to preserve the cutaneous nerves. The fascia of the first dorsal interosseous muscle was incised, and the muscle was gently retracted dorsally. A longitudinal capsulotomy was performed over the underlying mass, revealing a shiny, cartilaginous cap (Fig. 2). With its cartilaginous cap, the mass resembled a third condyle. The mass was located volar to the RCL and was able to be fully visualized without take-down of the collateral ligament. Passive digital flexion under anesthesia confirmed that the RCL was indeed subluxating over this mass. Once isolated, the mass was excised en bloc with a 1/4" osteotome and sent for both cultures and pathology. Stress testing under fluoroscopy after excision demonstrated an intact RCL. The wound was closed in layers, and the patient was placed into a soft dressing.

At his ten-day follow-up visit, the patient had complete resolution of symptoms (Fig. 3 and Video 2, available online on the *Journal's* website at www.jhandsurg.org). Pathology results were consistent with osteochondroma. He was counseled on the benign nature of osteochondroma and allowed gradual return to activity.

Discussion

When considering the evaluation and management for MP locking, it is important to understand the relevant anatomy. In the MCP joints, the RCLs are more horizontal compared to those in the ulnar collateral ligaments. Both radial and ulnar collateral ligaments contain two parts: the accessory and proper collateral ligaments. The accessory collateral ligament is fan shaped, more volar, and tighter in extension. Clinically, it can be assessed with adduction/abduction stress in extension. The proper collateral ligament is more cord-like, dorsal, and tighter in flexion. One may isolate these ligaments for adduction/abduction stress testing by flexing the MCP joint to 70°. The sagittal bands maintain extensor mechanism tracking in midline during MCP joint motion. During extension, the volar plate, a thickening of the joint capsule volar to the MCP joint, tightens to prevent hyperextension. Superficial to this plate lies the A1 pulley, which surrounds the flexor tendons of the finger.

Metacarpal heads articulate with the proximal phalanges at the MCP joint. Compared to the bicondylar phalangeal heads, the metacarpal heads tend to be rounded with a trapezoidal shape. This shape creates a cam effect that leads to dynamic changes in collateral ligament tension. Collateral ligaments originate at the dorsal aspect of the metacarpal and insert on the volar aspect of the proximal phalanx. When the digits flex, the collateral ligaments are pulled taut because of the increased distance from origin to insertion. Glickel et al¹ estimated that collateral ligament length is 14 mm with 20° of MP extension, 17 mm with 0° of flexion, 19 mm

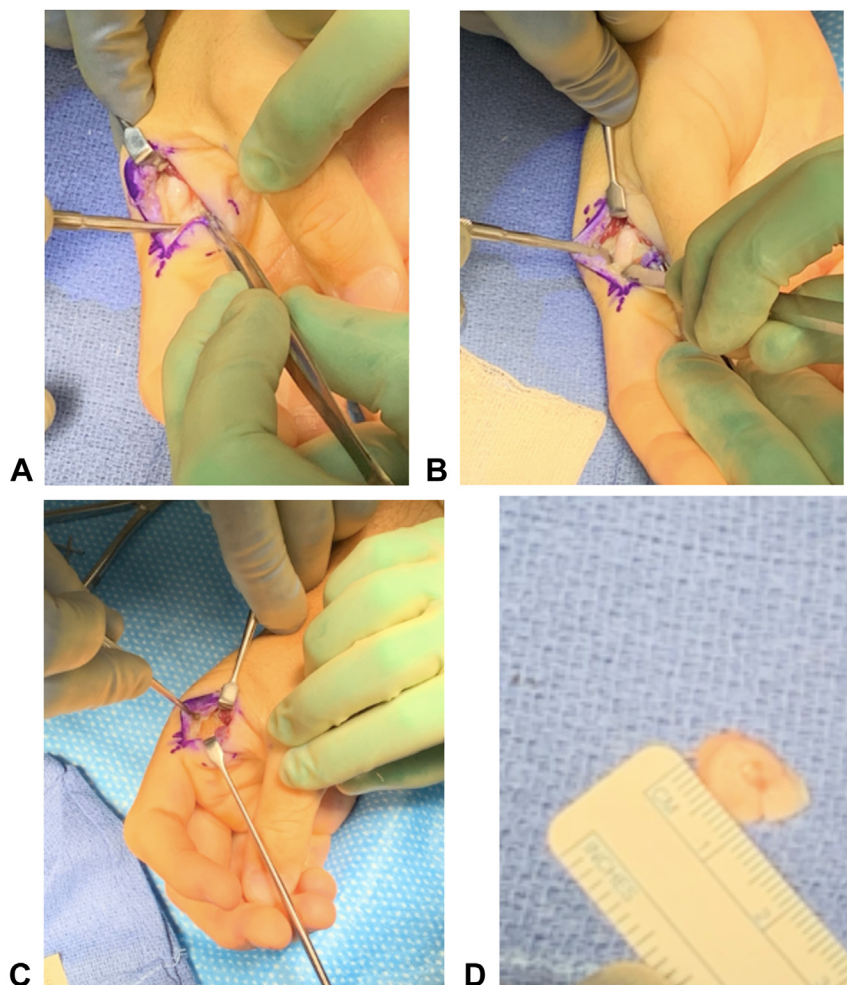


Figure 2. A Intra-operative images demonstrating exposure of bony mass with a shiny cartilaginous cap, B resection using a 1/4" straight osteotome, C underlying cancellous bone after resection, and D the specimen, measuring approximately 1 cm in length.

with 50° of flexion, and 18 mm with 90° of flexion. Along with changes in collateral ligament length, dynamic biomechanical changes in collateral ligament structure may further contribute to MP stability with digital flexion.²

When patients complain of subjective catching, snapping, or locking of a finger, several etiologies must be considered. Therefore, trigger finger (stenosing tenosynovitis), extensor tendon subluxation, rheumatoid arthritis, and osteoarthritis are included in the differential diagnosis. Based on our case, we also recommend considering bony prominences in the differential diagnosis.

Posner et al³ defined a locked MCP joint as a loss of active and passive extension of the MCP joint without flexion loss while accompanied by normal mobility of the interphalangeal joints. Thus, evaluation of patients with subjective complaints of MP "locking" must also include assessment for PIP joint locking. PIP locking with MP flexion usually occurs in addition to pain, tenderness, and crepitus or a palpable nodule at the level of the A1 pulley points toward a classic diagnosis of stenosing tenosynovitis. In our patient, these findings were absent, leading to the consideration of other diagnoses.

The initial differential diagnosis also included triggering at a location other than the A1 pulley. A few reported cases have described triggering in nearby tissues because of a flexor digitorum superficialis tendon "tag," a giant cell tumor within the tendon sheath, and an extraskeletal chondroma.^{4–6} These pathologies obstructed motion

near the insertion of one of the flexor digitorum superficialis tendon slips on the middle phalanx, within the carpal canal, and dorsal to the A1 pulley between the annular pulley and flexor tendons, respectively. The obstruction was palpable during the physical examination in each of these cases, which facilitated localization of the pathology. In our case, there was no palpable mass, but the patient complained of a catching, painful "snap" on the radial aspect of the MCP joint when nearing complete finger extension. The addition of advanced imaging to further explore the local and regional anatomy around the source of triggering may provide critical insight into the cause of symptoms, as it did with our patient.

Cases of locked MCP joints are quite rare but have been reported elsewhere in the literature.^{7,8} Among the reported cases, most involved radial accessory collateral ligament entrapment over a prominent metacarpal head osteophyte. One report cited three separate cases of patients with severe anorexia nervosa who experienced intrinsic muscle atrophy and subsequently developed MP locking without evidence of ischemia or neurologic disorders. Furthermore, reports of patients with achondroplasia or acromegaly and MP locking have been theorized to be related to metacarpal head morphology.⁸ Sesamoid entrapment behind an exocytosis near the second metacarpal head was found in two cases. Although several authors have indicated that tumors as a potential etiology of MP locking, few actual reports of oncologic causes exist. We found two reported instances of metacarpal osteochondromas causing MCP



Figure 3. Postoperative posteroanterior radiograph demonstrating osteochondroma removal from the radial aspect of the index finger metacarpal neck.

joint locking.⁹ Phalangeal osteochondromas are another rare yet important etiology of triggering or locking. Reports in the literature

suggest that phalangeal osteochondromas are more common in the pediatric population, though adults have also been affected. Phalangeal osteochondromas in children are frequently associated with hereditary multiple exostosis, although solitary instances have also been reported.¹⁰

Osteochondromas are the third leading cause of cartilage tumors in the hand, and cartilage tumors account for approximately 65% of all tumors affecting the metacarpals. Although most osteochondromas in the hand are asymptomatic, those causing deformity, pain, and dysfunction may require surgical intervention. Our case report supports the inclusion of metacarpal head osteochondroma in the differential diagnosis of a “trigger finger.”

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