



Carpometacarpal Joint Osteoarthritis

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Definition

CMC OA is a degenerative condition affecting the articulation between the trapezium and the base of the first metacarpal bone. This is a consequence of joint motion associated with an opposable thumb. As the degenerative process evolves, the joint begins to sublux in a dorsal-radial direction due to the pull of the APL tendon on the metacarpal.

Diagnosis

CMC OA is the second most common form of hand OA, with the DIP joint being the most frequently affected [1]. This diagnosis should always be considered in patients reporting pain at the base of the thumb. Common symptoms include aching discomfort at the base of the thumb during activities requiring the use of the hand and pain later at rest after activities. Sudden movements of the thumb or grasp may cause acute stabbing pain.

Caucasian postmenopausal females have a 6–20 times increased risk of CMC OA, as this joint is smaller and less congruent, where congruency is defined as matching sizes of

the two sides of the joint [1]. Evolutionary pressure for a less constrained joint intricates kinematics and compressive loads with functional activity, and hormonal influences related to sex and age all contribute.

Differential Diagnosis

- Carpal tunnel syndrome
- Flexor stenosing tenosynovitis of the FPL (flexor pollicis longus – trigger thumb)
- De Quervain’s tenosynovitis
- Extensor pollicis longus (EPL) tendinitis

Physical Exam

- Inspect the joint for bony hypertrophy at the base of the thumb.
- Palpate for pain over the joint and the presence of pain with active range of motion.
- Provocative maneuver: grind test (mortar and pestle; compression test).
 - Grasp the thumb just proximal to metacarpophalangeal (MCP) joint and apply axial load during passive rotation to reproduce pain (42% sensitivity and 80% specificity) [1].

Imaging

- X-ray: The first CMC joint is somewhat difficult to visualize due to the contour and obliquity of the trapezium. Thus, specialized views have been developed in addition to the standard PA and lateral views to provide an unobstructed view of the trapezium.
- The Eaton classification (Table 27.1) has been developed to stage osteoarthritis of the first CMC based upon x-ray findings.

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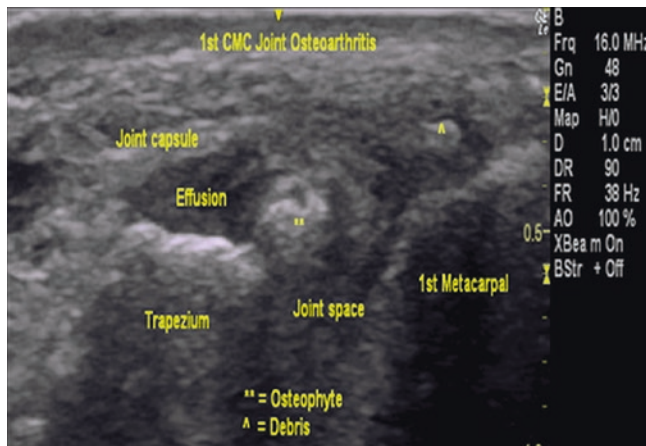
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Table 27.1 Eaton classification for x-ray findings in first CMC osteoarthritis

Stage	Description
I.	Articular contours are normal. There may be slight widening of the joint space because of effusion or laxity of the ligamentous support of the TM joint
II.	Slight narrowing of the TM joint. Minimal sclerotic changes of the subchondral joint debris not exceeding 2 mm in diameter in the form of bone. There may be osteophytes or loose bodies. ST joint should appear normal
III.	Joint space markedly narrowed or obliterated with cystic changes, sclerotic bone, exceeding 2 mm in diameter with varying degrees of dorsal subluxation. The ST joint appears normal
IV.	Complete deterioration of the TM joint as in stage III with additional ST joint narrowing with sclerotic and cystic changes apparent

TM trapeziometacarpal, ST scaphotrapezial

**Fig. 27.1** Osteoarthritic first CMC joint

- Bett's (Getta's) view
- Robert's view
- Ultrasound (Fig. 27.1)

Treatment

- Activity modification
 - Limit, modify, or avoid activities that exacerbate symptoms.
- Splinting
 - Soft off the shelf splint such as a thumb spica splint: indicated for non-strenuous activity (Fig. 27.2) [2].
 - Rigid custom-molded splint: indicated for heavy work and increased activity.
- Occupational therapy
 - Range of motion exercises to maintain first web space: since the distal part of first metacarpal is dynamically tethered by the adductor pollicis with continued

**Fig. 27.2** Thumb spica splint

dorsoradial subluxation of the joint, the thumb metacarpal eventually assumes an adducted posture. This in turn leads to an inability to abduct the thumb at the trapeziometacarpal joint [6].

- Soft tissue and joint mobilization to improve joint mobility.
- Manual therapy: combination of joint mobilization, neural mobilization, and exercise is more beneficial in treating pain than a sham intervention in patients with CMC joint OA [8].
- Maintain pinch and grasp strength through gentle hand strengthening exercises.
- Adaptive equipment for ADLs.
- Education on joint protection techniques.
- Splint fabrication with respect to CMC splints: the quality of evidence in the literature is high to moderate to decrease pain and improve function and moderate to increase grip strength.
- Medications
 - Oral anti-inflammatories and/or analgesics.
 - Topical anti-inflammatories and/or analgesics: these can be especially effective due to the superficial location of the joint.
- Modalities
 - Ice: best for acute inflammation.
 - Heat: some evidence exists that heat helps improve grip strength and improve pain [1].
- Injections
 - Should preferably be given using some form of image guidance (i.e., ultrasound or fluoroscopy) to ensure injection accuracy.
 - Corticosteroid injections.
 - Viscosupplementation: published literature has shown benefit in the form of decreased rest and activity pain, improved function, improved strength, and decreased NSAID consumption.

- Platelet-rich plasma (PRP): still experimental but with promising emerging research [3].
- Surgery
 - For chronic, intractable pain, and/or instability.
 - First CMC OA is the most frequent hand osteoarthritic problem for which patients seek surgical treatment.

Return to Play/Work

- No restrictions
- Continue routine activities as tolerated

When to Refer

- Early treatment options include: Splinting, ADL evaluation/training, and adaptive equipment as described above
- For an image-guided injection if the patient otherwise fails to respond to activity modification, medications, and splinting
- For possible surgical intervention if there is a failure to respond to above conservative treatment [4]

Referral

- Occupational therapist
- PM&R specialist for procedural intervention
- Orthopedic hand surgeon for refractory cases

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