Thumb CarpoMetaCarpal Arthritis

Dr. Jasem Benahmaida
28-07-2021
Epidemiology

The prevalence of symmetric thumb CMC OA is 6% in women and 2.6% in men (Finland). The prevalence increases steadily beyond age of 40.

It occurs more severely and rapidly in women than men in all age groups.
Basic Anatomy

Thumb CMC is a “saddle” joint (1854 by Fick). The joint has two surfaces which are not equal in radius. While the static stability of the first CMC joint is provided by ligamentous attachments, the dynamic stability is provided by muscles.
Clinical features

It is variable
Pain associated with activity
Associated weakness of pinch grasp
Crepitus
Swelling
Tenderness
Loss of opposition
Swan neck deformity
Clinical features

ROM restriction, painful movement, swelling and tenderness are associated with radiographic signs of OA but radiographic abnormalities are not always associated with symptoms.

Examination:

The Shear/Grind test is to evaluate reproduction of symptoms, Crepitus, Degree of joint subluxation.
Imaging

It includes standard AP, lateral and oblique views and an additional basal joint stress view.

Stress views by pressing the tips of the thumbs together in the AP view with the nail plates parallel to the plane of the X-ray.
The Robert’s view:
is performed by maximally pronating the hand and internally rotating the shoulder. This allows the dorsum of the thumb to rest on the radiograph cassette. All 4 facets of the trapezium are visualised readily with this view.
Classification - described by Eaton in 1973

Eaton I – slight joint space widening (pre-arthritis); Apparent normal articular cartilage on X-ray

Eaton II – slight narrowing of CMC joint with sclerosis, osteophytes <2mm

Eaton III – marked narrowing of CMC joint with osteophytes, osteophytes >2mm.

Eaton IV - Severe pain and limitation in ADL. Pantrapezial arthritis (STT involved)
Differential diagnosis

De Quervain tenosynovitis
Flexor Carpi Radialis tendonitis
Carpal tunnel syndrome.
Scaphoid pathology - fracture, nonunion, AVN, Scapho-Trapezio-Trapezoid OA
Carpo-radial OA
Trapezium tubercle fracture.
Ganglion – dorsal / volar
Metacarpophalangeal joint – OA
Rheumatoid arthritis
Management

Dictated by the clinical symptoms and not radiographic findings to treat the patient. 30% of females ≥ 50 years have X-ray changes of trapezio-metacarpal arthritis

- Non Operative treatment:
  Hand therapy
  Abduction splinting of the thumb to decrease pain.
  NSAID combined with splinting
  Corticosteroid injection
Management

- Operative treatment:
  It is dictated by patient’s symptomatology (Pain/instability), age, occupation.
  Failure of non operative measures.
  Radiographic findings

Surgical options:
  Ligament reconstruction
  Excision arthroplasty ± LRTI
  Arthroplasty
  Extension osteotomy
Management

A - Procedures involving stability of the trapezio-MC joint

1 - Thumb CMC arthrodesis.
The position of the thumb is in the Key pinch
2 - Volar ligament reconstruction
Management

B - Resection arthroplasty

1- Simple Trapeziectomy – Gold standard
2- Distraction Trapeziectomy with hematoma formation
3- Trapeziectomy with “anchovy” interposition
4- Trapeziectomy with ligament reconstruction
5- Ligament reconstruction & tendon interposition (LRTI)
A common method for performing the LTRI. After trapezectionomy, a drill hole is made from the proximal palmar to distal dorsal in the thumb metacarpal.
The radial half of the FCR is harvested proximally and passed through the drill hole.
The excess FCR is sutured to itself and folded into an anchovy. The anchovy is secured in the post-trapiezectomy space.
Management

C - Joint Arthroplasty

* Silicone implants – High failure rate.
* Swanson titanium condylar implants
* Unconstrained HA coated implant
* Cemented retentive implant
Management

D - Procedures involving Trapezium retention

1- Partial Trapeziectomy with tendon interposition
2- Single Interposition arthroplasty
3- Double interposition arthroplasty
4- Partial Trapeziectomy with Interposition of Biologic implant
Management

E - Metacarpal extension osteotomy

F - CMC arthroscopy

G – Management of associated Thumb MP joint deformity
  . EPB tenotomy and transfer
  . MP arthrodesis
CMC – trapeziectomy with Double liftloops suspensionplasty
Surgical technique

Using a Double liftloop to suspend the thumb has been presented as an another option for thumb metacarpal stabilization after trapeziectomy. The implant is the “Double liftloop” device. The device involves several strands of fiber wire sutures connect with two small metallic buttons.

This device (The Double liftloop) is used to suspend the thumb metacarpal from the 2nd metacarpal to avoid subsidence into the a new formed CMC space.
-All patients underwent the Double liftloop (Orthomed) technique of suspensionplasty technique.
-This involves admission to the hospital one day before the surgery, were required to NPO at least six hours prior to the surgical procedures and received one gram of Cefazolin intravenously at least 30 minutes before surgery and continuous three doses after post surgery.
-The patient was positioned supine on the operating table with hand table and a tourniquet was applied to the arm, Regional anaesthesia by means of brachial plexus block or general anaesthesia was administered and monitored by an anaesthetist, Fluoroscopy was used during the procedure.
-The operation site was then sterilised and draped. The tourniquet was inflated to 250mmHg.
The thumb CMC joint was approached through 4 cm dorso-radial skin incision centered over the trapeziometacarpal joint.

Volar and dorsal branches of the dorsal radial sensory nerve were protected, radial artery was dissected and protected with a siliastic or glove sling.

The joint capsule was opened between the abductor pollicis longus and extensor pollicis brevis, retractor was used to keep the APL and EPB on each side of wound to protect the superficial branches of radial nerve.

Perform a full trapeziectomy either piecemeal or by insertion of a guide wire in the trapezium and soft tissues dissected around the trapezium to allow full excision of trapezium as a single piece, osteophytes between the index and thumb metacarpal base were removed.

FCR was protected after performing its partial synovectomy.

Second incision about 2cm between the metacarpal bases 2nd and 3rd.
- Elevate the muscle subperiosteally (2nd dorsal interosseous muscle) from the medial aspect of the 2nd metacarpal to view the medial base of the metacarpal index, guidewire 1.2 mm is introduced and starting the dorsal-radial metacarpal base of the thumb toward the 2nd metacarpal recommended proximal one third of the 2nd metacarpal through both cortices of both metacarpals and Confirm the trajectory under fluoroscopy.

- When correct trajectory is established, over drilled the K-wire with a 2.7-mm cannulated drill through all 4 cortices, remove the drill and carefully retain the guide wire.

- Place the Double liftloop single strand into the Nitinol loop of the K-wire.

- Only place 3 cm of suture though the loop, pull the opposite end of the Suture (Passing K-wire), bringing the suture wholly through the 2nd metacarpal.
-Pull the suture and carry the oblong button to contact the radial side of the metacarpal of the thumb and Cut the suture on the ulnar aspect and load the second oblong button onto the suture and bringing it down to the 2nd metacarpal.

-The thumb can be reduced into the desired anatomic resting position by applying axial traction and palmar abduction and extension at base of first metacarpal and tight the suture (over tightening isn’t recommended) it may lead to impingement of the thumb metacarpal base against the second metacarpal and decreased range of motion.

-Attention was given that thumb had full radial abduction at the time of final tightening of the Double liftloop. Stability of the suspension was checked by manual compression and distraction of the joint.
Capsule was closed with abductor pollicis longus in the repair with 2/0 vicryl suture. Skin was closed with subcutaneous sutures. Double liftloop knot was buried between the second and third web space and closure was done in layers. Patient was put in dorsal thumb splint for 10-14 days.
Results

General characteristics
A total of 18 patients (66.6% female (n=12); 33.3% male (n=6) were included in this study over a period of 2 years. One patient had bilateral hand involvement, but was operated on separate occasion, making the total number of hands included in this study 19 hands, patient. The mean age of patients was 64.3 ± 10.0 (n=19). The youngest patient enrolled was 39 years old and the oldest was 81 years.

Clinical characteristics
The surgical technique proved successful in all 18 patients (and 19 hands) with no intra-operative complications. No devices needed removal or caused complications. One patient, who was also treated for Carpal tunnel syndrome, had persistent pain at 9 months, but this improved after revision carpal tunnel release.
Complications

- Subluxation - Poor volar ligament graft tensioning – revision required
- Proximal thumb metacarpal migration with painful instability.
- Stiffness
- Infection
- Scar tenderness.
- Residual pain
- RSD
- Superficial radial nerve sensory loss – temporary or permanent.
- Iatrogenic metacarpal base fracture.
- Late MP joint collapse with pain.
Conclusions

- CMC OA is a common disease.
- Female predisposition
- Management – clinical with radiological guidance
- Most common operative technique for general ortho-surgeons is Trapezium excision & tendon interposition arthroplasty.