

CMC Joint Arthroplasty with the Ensemble CMC™ Implant

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PATIENT HISTORY

A 58-year-old, active, right hand dominant female, with greater than three-year history of carpo-metacarpal (CMC) osteoarthritis of the basilar joint of the thumb presented with impaired motion, pain during active range of motion, impaired strength, and moderate tingling in palm, thumb and index finger. Conservative treatment, including NSAIDs, corticosteroid injections, occupational therapy, and bracing with a custom fit orthosis had been implemented in the past. Preoperative evaluation revealed edema and pain at the right CMC joint, with positive CMC grind test, with palpable crepitus and pain. There was no evidence of hyperextension or laxity of the metacarpophalangeal (MCP) joint. Preoperative radiographic imaging of the CMC show Eaton-Littler stage 3 osteoarthritis of the right thumb with a prominent volar-medial osteophyte and loss of joint space with approximately 25% subluxation of the joint (**FIGURES 1-3**).

The patient declined further conservative treatment and was presented with surgical options including ligament reconstruction tendon interposition (LRTI), arthroscopic hemi-resection trapeziectomy, and stemmed CMC implants. Due to her desire to resume her active lifestyle, the possibility of a shortened recovery time, and the potential to maintain her grip strength, she selected to receive the minimally-invasive, stemless Ensemble CMC™ arthroplasty.

SURGICAL TREATMENT

Under general anesthesia, an arthroscopic evaluation of the joint was performed with two standard 1R and 1U portals over the base of the CMC joint. Exposed bone absent of cartilage was noted on both the trapezium and the base of thumb metacarpal. Several small loose bodies were removed arthroscopically. Gentle resurfacing of the trapezium and base of the thumb metacarpal was then performed using a 4.0mm full radius resector. The 1R portal was then extended approximately 1.5cm, centered over the CMC joint to allow for exposure of the joint. Dissection was carried out bluntly with care taken to preserve the branches of the superficial radial nerve and extensor pollicis longus tendon.

The Ensemble rasps were then used to prepare the shape of the articular surfaces of the metacarpal and trapezium to facilitate implantation of the Ensemble CMC™ device. Trials were inserted into the joint and visualized using fluoroscopy. A size assessment of the implant was performed, and the Size 151 implant was selected as it was found to have satisfactory coverage of the trapezium with good stability throughout the range of motion. Following insertion, the implant was evaluated under fluoroscopy in both the AP and lateral plane. The thumb exhibited excellent range of motion with the thumb opposable to all digits and base of the small finger, circumduction was not limited, and there was no evidence of instability of the implant. Standard closure was performed using 4-0 vicryl suture. Sterile dressings and a thumb spica splint were applied.



FIGURE 1: PRE-OP



FIGURE 2: PRE-OP



FIGURE 3: PRE-OP

▶ POSTOPERATIVE CARE

The patient was maintained in a forearm-based thumb spica immediately post-op and initiated gentle active range of motion at the one-week follow-up. Six days postoperatively, the patient was evaluated by a Certified Hand Therapist and fitted with a removable, custom fit orthosis. An eight-week postoperative hand therapy protocol was described to the patient with onsite visits 1-2x per week. Short term goals included edema reduction, scar management, orthotic use, pain reduction, and active range of motion exercises. Long term goals included grip and pinch strength improvements, pain reduction, and active range of motion exercises. The splint was advanced at four weeks postoperatively from forearm-based to hand-based. The patient was compliant with this protocol.

Postoperative radiographs revealed a well-placed and well-aligned pyrocarbon implant at the CMC joint, with excellent maintenance of joint alignment and congruity (FIGURES 4-7).

▶ CLINICAL OUTCOMES

At four months postoperatively, pain scores improved from 7/10 to 0/10, and quickDASH scores improved from 73 to 7. The patient had excellent range of motion and was able to oppose her thumb to all digits easily, with no pain. Lateral pinch and grip strengths improved by 4lb and 9lb, respectively.

At 15 months following surgery, the patient's pain score was 1/10, and her quickDASH score further improved to 2.27%.

▶ SURGEON CONCLUSION

The Ensemble CMC™ has been shown to be an excellent option for the treatment of CMC osteoarthritis. Arthroscopic evaluation of the joint space at the initiation of surgery is effective at visualizing the joint space and allowing for minimally invasive excision of osteophytes. Additionally, the trapezium is able to be finely remodeled arthroscopically with a shaver or burr to allow for a smaller incision to be utilized for the introduction of the implant into the joint space and a decreased need for manual rasping of the trapezium.



FIGURE 4: TWO WEEKS POST-OP



FIGURE 5: TWO WEEKS POST-OP



FIGURE 6: THREE MONTHS POST-OP



FIGURE 7: THREE MONTHS POST-OP



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