Treatment of Osteoarthritis at the Base of the Thumb with PyroCarbon NuGrip™ CMC Hemiarthroplasty

Patient History
70-year-old female barber complained of severe pain in the right, non-dominant thumb with limited mobility. There was no inciting event. She rates her pain at 6/10. The pain is aggravated by moderate activities such as carrying a shopping bag, and she has severe difficulty, or no ability, with many activities such as playing the piano and using a knife to cut food. Over the course of 24 months, she has failed to improve despite the treatment of rest and medication. The severe pain and limited range of motion have left her unable to continue working and performing normal activities. The patient wishes for definitive treatment to lessen the pain and return to more normal function. Patient had previously been treated with a NuGrip implant on left CMC for osteoarthritis.

Preoperative Assessment / ROM
A physical exam revealed primary diagnosis of osteoarthritis at the base of the thumb. Limited range of motion noted. Right grip strength averaged at 23 with a lateral pinch of 9. DASH score rated at 52.275. Right opposition measured -1.5 cm to SF DPC. She has no motor or sensory deficits, and reflexes are normal.

Selected Treatment
This patient is an excellent candidate for CMC Arthroplasty. Standard arthroplasty with ceramic implants shows subsidence of the implants into the metacarpal and trapezium bone.1 Alternately, synthetic spacers have been shown to loosen, causing infection and inflammatory response, with even lower success rates.2,3,4 The Ascension® NuGrip™ CMC Implant made of PyroCarbon was chosen as the alternative treatment device. The device is a single component which minimizes bone resections and preserves the trapezium. The stem is anatomically designed to press fit within the intramedullary canal without the use of cement. This specifically-designed stem enhances stability and minimizes the possibility of movement or toggling of the stem within the canal.

Outcome
Arthroplasty was performed using a dorsal approach on the right CMC joint. The articular surface of the metacarpal is excised; the intramedullary canal is prepared with broaches. The canal is prepared to accept the largest implant that will fit in the metacarpal easily. A centralized cup was made in the trapezium with a full rim of cortical bone around the cup to properly to seat the head of the implant allowing full range of motion while limiting the opportunity for subluxation. Interoperative complications included removal of a bone cyst. Additional bone graft was used to ensure a snug fit within the intramedullary canal. Patient tolerated the procedure without complications.

3 Months Postoperative
The patient reported improvement in pain intensity 4/10 (compared to 6/10 preoperative). Right grip strength averaged at 20 with a lateral pinch of 8. DASH score rated at 47.725. Right opposition measured -2.5 cm to SF DPC.

6 Months Postoperative
Patient maintained improvement in pain intensity 4/10. Right grip strength increased with an average of 20 and maintained a lateral pinch of 8. DASH score rated at 45.25. Normal household activities are able to be performed with only moderate pain.

9 Months Postoperative
The patient showed continued improvement in pain intensity and denies any significant complaints while showing excellent range of motion. X-rays reveal adequate longitudinal alignment of both implants in bilateral thumbs. Right grip strength decreased slightly with an average of 18 while maintaining a lateral pinch of 8. DASH score rated at 22.725. Normal household activities were reportedly performed with little or no pain including using a knife to cut food and piano playing.