

Early Outcomes of Arthroplasty of the First Carpometacarpal Joint Using Pyrocarbon Spherical Implants

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Abstract

Purpose: A survey found that many surgeons have revisited implant arthroplasty for osteoarthritis(OA) of the first carpometacarpal joint(CMC) because it preserves critical structures. However, there is currently no ideal implant design and composition. This was the first study that used and evaluated the early outcomes of pyrocarbon spherical implants for arthroplasty of the first CMC in patients with Eaton-Littler stage II and III OA.

Materials and Methods: Patients who failed conservative management from May 2010 to April 2013 were recruited. Measurements of patient outcome included a Kapandji score, visual analogue scale for pain, Likert 5-point scale for satisfaction, DASH questionnaire and radiographic evaluation. Statistical analyses included paired samples t-test and descriptive statistics (mean, range, standard deviation (SD)).

Results: A single surgeon performed twenty-four arthroplasties of the first CMC (9 right hands and 15 left hands) using pyrocarbon spherical implants. This consisted of 23 patients, 20 females and 3 males, with an average age of 56 years (range 46-75 years). At an average follow-up of 18.5 months post-op (range 4.3-38.9 months, SD=11.16), the average Kapandji score was 8.8/10 (range 7-10). There was a significant decrease in pain from 8.96/10 (range 8-10, SD=0.64) pre-op to 1.13 /10 (range 0-4, SD=1.22) post-op ($p<0.001$). All patients were either very satisfied (score=5/5.00) or satisfied(score=4/5.00) with the operation, with an average satisfaction value of 4.76/5.00 (range 4-5, SD=0.44). The average post-op DASH score was 11.79 (range 0-49.17, SD=14.29), which was slightly higher than the normative value, 10.1 (1). Latest radiographs confirmed all implants were stable with no erosion of nearby bone (Figure 1). There were no implant subluxations, dislocations, or revisions.



Figure 1. Plain radiograph of the right hand following arthroplasty of the first carpometacarpal joint using a spherical pyrocarbon implant.

Conclusions: The biocompatibility of pyrocarbon and the wide range of motion of the first CMC make the spherical-shaped pyrocarbon implant an ideal choice. Early outcomes show promising

results and support continued use, but long-term follow-up will be needed to confirm these findings.

References:

1. Hunsaker FG, Cioffi DA, Amadio PC, Wright JG, Caughlin B. The American Academy of Orthopaedic Surgeons Outcomes Instruments – Normative Values from the General Population. *Journal of Bone and Joint Surgery* 2002; 84-A(2):208-215.

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