Long-Term Outcomes Comparing Patients with Carpometacarpal Arthroplasty and Metacarpophalangeal Fusion, Carpometacarpal Arthroplasty, and the Unoperated Side

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INTRODUCTION:

Patients with carpometacarpal (CMC) arthritis often present with metacarpophalangeal (MP) hyperextension and/or thenar atrophy concomitantly, see Figure 1. This study hypothesizes that an MP fusion done at the time of CMC arthroplasty for patients with MP hyperextension greater than 30°, moderate to severe thenar atrophy, or MP arthritis will have greater pinch strength long-term when compared with the unoperated side or those who had a CMC arthroplasty alone.

METHODS:

Retrospective review of long-term results from patients who had undergone either a CMC arthroplasty (consisting of trapezial excision, abductor pollicis longus suspension sling, and cadaveric fascia lata graft interposition) or a CMC arthroplasty and MP fusion (with clip staples and trapezial bone graft) done by the senior author were recorded. The Quick Disabilities of the Arm, Shoulder, and Hand Score (QuickDASH), Visual Analog Scale (VAS), and an average of three pinch readings from each thumb were measured on the Baseline pinch gauge (30-pound capacity) and recorded. Statistical analysis included paired sample t-tests to determine significant differences between groups. Significance was set at $p<0.05$.

RESULTS:

Ninety patients (68 females) had 113 operated thumbs: 53 CMC arthroplasties, and 60 CMC/MP fusions. The average age was 67.3 years. The average length of follow up was 5.9 years (range 1 year to 16.9 years). CMC/MP fusion pinch strength (12.7lbs) was significantly stronger than patients who had a CMC arthroplasty alone, 10.9lbs (p=0.01), see Figure 2. When comparing pinch strength values of those with a CMC arthroplasty and the unoperated side there was no significant difference 10.9lbs. vs. 10.8lbs. (p=0.46). When CMC/MP fusions were compared with unoperated thumbs, there was a significant difference in pinch strength 12.7lbs. vs. 10.8lbs (p=0.01). In a paired analysis of 18 patients who had a CMC arthroplasty on one hand and a CMC/MP fusion on their other hand, the CMC/MP fusion was significantly stronger than the CMC arthroplasty alone 10.5lbs vs. 12.3lbs (p=0.03). Quick DASH and VAS revealed similar values in both the CMC (11.8 and 0.60) and CMC/MP (10.8 and 0.53) groups respectively.

DISCUSSION AND CONCLUSION:

Long-term results demonstrate a significantly stronger pinch in those patients who have a CMC/MP fusion than those who underwent a CMC arthroplasty alone. CMC/MP fusions also were stronger than the unoperated side. The MP fusion adds strength to thumbs by restoring the functional mechanics at the MP joint and this strength was maintained long-term.

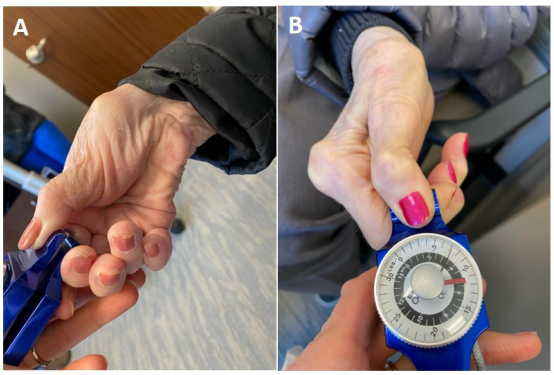

Figure 1. Patterns of dysfunctional pinch in patients with CMC arthritis. **A.** In patients with CMC arthritis and MP hyperextension the thumb collapses during key pinch. **B.** In patients with moderate to severe thenar atrophy and CMC arthritis the thumb rolls into adduction during key pinch.

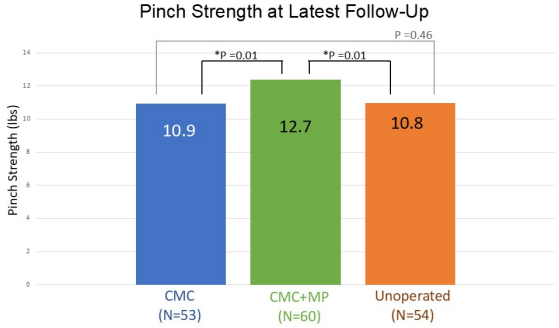

Figure 2. At latest follow-up CMC/MP strength was significantly stronger than unoperated side and CMC alone 12.7lbs vs 10.8lbs and 10.9lbs respectively. * Indicates statistical significance.