Arthroscopic Resection Arthroplasty for Treatment of Combined Carpometacarpal and Scaphotrapeziotrapezoid (Pantrapezial) Arthritis

Tyson Cobb, MD, Patrick Sterbank, BS, Jon Lemke, PhD

Purpose Arthroscopy of the carpometacarpal (CMC) and scaphotrapeziotrapezoid (STT) joints has been described for the purpose of diagnosing, staging, and treating CMC and STT pathology. This study evaluates the short-term outcome of arthroscopic resection arthroplasty (ARA) for pantrapezial arthritis.

Methods Thirty-five cases of ARA of the CMC and STT joints were performed in 34 patients with one year minimum follow-up. There were 27 women and 7 men. Average age was 63 (range, 46 to 79). All patients had simultaneous ARA of both the CMC and STT joints. A 2- to 3-mm section of bone was resected from the proximal and distal aspect of both the CMC and STT joints. Preoperative data collected included 10-point self-reported pain scale, Disabilities of the Arm, Shoulder, and Hand (DASH) outcome measure, range of motion, grip strength, key and chuck pinch, length of symptoms, and treatment. Postoperative data included the same data plus patient satisfaction, graded on a 0 to 5 scale. Data were collected at postoperative months 1, 3, 6, and 12.

Results Average time of postoperative immobilization was less than 3 weeks (range, 2–6). The DASH scores averaged 46 before surgery, and 51, 30, 20, and 19 respectively, for the aforementioned postoperative intervals. The mean improvement in key pinch was 1.3 kg. The mean improvement in grip was 4.3 kg. Pain improved from 7 before surgery to 1 at one-year follow-up.

Conclusions Short-term analysis suggests that ARA for pantrapezial arthritis provides satisfactory pain relief and return of strength and function. *(J Hand Surg 2011;36A:413–419.*

Type of study/level of evidence Therapeutic IV.

Key words Arthritis, arthroplasty, arthroscopy, CMC, resection arthroplasty, STT.

Arthroscopic resection arthroplasty (ARA) of the carpometacarpal (CMC) joint has been reported by multiple authors with reasonably good results.[1,2,3–7] Indications have generally included substantial cartilage loss at the CMC joint, precluding a joint-sparing procedure, and a preserved scaphotrapeziotrapezoid (STT) joint. Badia proposed an arthroscopic classification of the CMC joint based on arthroscopic findings that allows for better overall decision making of treatment options.[1] He proposed that arthroscopic resection arthroplasty be performed on stage III, which he described as widespread, full-thickness loss of cartilage of the CMC joint. Patients with advanced STT arthritis had open trapezial excision suspension plasty under Badia's treatment algorithm.

Arthritis of the scaphotrapeziotrapezoid (STT) joint can be a significant source of pain in patients with

From Orthopaedic Specialists, Davenport, and Genesis Medical Center, Davenport, IA.

Received for publication September 30, 2009; accepted in revised form November 22, 2010.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

Corresponding author: Tyson Cobb, MD, Orthopaedic Specialists, 3385 Dexter Court, Suite 300, Davenport, IA 52807; e-mail: avanutrecht@qcorthospecialists.com, tycobb@mchsi.com.

0363-5023/11/36A03-0006$36.00/0
doi:10.1016/j.jhsa.2010.11.039

thumb carpometacarpal (CMC) arthritis.[7–11] Arthroscopy of the STT joint has been described for the purpose of diagnosing, staging and treating STT arthritis.[12–20]

Arthroscopic debridement of STT arthritis has been reported to have a 90% satisfaction rate at 3-year follow-up.[18] Other authors have reported improvement in pain, mobility, and strength following ARA of the STT joint.[19] Interposition following ARA has been compared to arthroscopic resection without interposition. Grip and pinch improved in both groups. Patient satisfaction was comparable for both groups; however, STT resection arthroplasty without interposition showed substantially greater range of motion compared to patients with soft tissue interposition.[20]

The purpose of the study was to evaluate the early results of ARA of both the CMC and STT joints for patients with pantrapezial arthritis. Although the results of ARA for the CMC and STT independently have been good, results for the combined procedure for pantrapezial arthritis are lacking.

PATIENTS AND METHODS

Internal review board approval and informed consent were obtained. The authors are currently conducting a prospective study of ARA of the CMC joint. A total of 101 cases were treated over a 3-year period (2006–2008). Of these cases, 39 also had ARA of the STT joint. The current study of these 39 cases of pantrapezial ARA in 38 patients represents a subset of this prospective CMC study. Four patients were lost to follow-up. After excluding these 4 patients, we had a total of 35 cases of pantrapezial ARA in 34 patients with a minimum of 1 year follow-up. All cases were performed by 1 surgeon. The mean age was 64 years (range, 46–84) at the time of surgery. There were 27 women and 7 men. Preoperative length of symptoms averaged 48 months. The dominant side was involved in 16 cases. Five cases were involved in workers compensation claims.

Surgical indications included pain localized to both CMC and STT joints; radiographic changes consistent with arthritis; and full-thickness, widespread cartilage loss of both joints found at the time of arthroscopy. Diagnostic injections under fluoroscopic control were used when needed to confirm the diagnosis. Diagnostic injections were performed as follows: pinch and grip strength and pain were evaluated before and 10 minutes after injection of local anesthetic into the CMC joint under fluoroscopic control. Patients who continued to have pain after the CMC injection were re-evaluated 10 minutes after injection of the STT joint. Those with relief of some but not all pain after the CMC injection who had complete relief of pain and improvement in strength after the STT injection were considered to have a positive injection test of both the CMC and STT joints and, therefore, to be good candidates for ARA of both the CMC and STT joints.

All patients received conservative treatment, which included rest, splints, anti-inflammatory drugs, cortisone injections, and physiotherapy. A total of 14 patients had 1 injection, 3 patients had 2 injections, and 4 patients had 3 or more injections. A total of 23 injections were given at the CMC, and 11 were given at the STT joint.

Patients were assessed before surgery and at 1, 3, 6, and 12 months after surgery. All patients had a minimum of 1 year of follow-up. Key pinch, chuck pinch, and grip strength were assessed by an occupational therapist with a pinch gauge (Sammons Preston, Inc., Bollingbrook, IL) before surgery and at 1, 3, 6, and 12 months after surgery. Grip strength was assessed at the same time intervals using a Jamar hand dynamometer (Sammons Preston, Inc.), with strength reported for the second Jamar setting. Measurements for thumb CMC motion were obtained before surgery and at 1, 3, 6, and 12 months after surgery. All measurements were obtained by certified hand therapists using a standard goniometer. Opposition, palmar abduction, and web span are reported. Occupational therapists used methods of measurement as directed in the American Medical Association's *Guides to the Evaluation of Permanent Impairment*, 5th edition, for measurement of opposition and palmar abduction. Web span was measured from the thumb interphalangeal crease to the proximal flexion crease of the index, with the thumb in radial abduction.[21] The DASH scores were obtained before surgery and at each postoperative interval. Return to work time was calculated for working patients.

Additional follow-up was obtained by phone consultation on all patients at an average of 24 months (range, 12 to 40). Variables assessed by phone follow-up included pain, satisfaction, presence or absence of revision surgery, and whether the patient would have the surgery again. Pain was recorded on a scale of 0 to 10 before surgery, at each postoperative interval, and by phone follow-up. Satisfaction was assessed at each postoperative interval and at phone follow-up, based on a scale of 0 to 5, with 0 being completely unsatisfied and 5 being completely satisfied.

Surgical technique

The patient was placed on an operating room table with the shoulder abducted and externally rotated. The arm was