SCIENTIFIC ARTICLE

Cheilectomy for Treatment of Symptomatic Distal Interphalangeal Joint Osteoarthritis: A Review of 78 Patients

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Purpose To determine whether open cheilectomy and debridement of the distal interphalangeal (DIP) joint is a safe and effective alternative to joint arthrodesis for the treatment of symptomatic osteoarthritis.

Methods Seventy-eight patients with symptomatic DIP joint osteoarthritis and with a minimum follow-up of 24 months were retrospectively reviewed. Preoperative radiographs were graded. Open cheilectomy and debridement of the DIP joint was performed in all patients. The DIP joint was immobilized for 4 weeks after surgery. Patients were evaluated clinically and radiographically. Visual analog scale pain scores and range of motion were assessed.

Results At a median final follow-up of 36 months (minimum, 24 months), there was a significant improvement in mean visual analog scale pain scores from 8 to 1. Distal interphalangeal joint flexion contracture was improved by a mean of 6° and DIP joint range of motion was improved by a mean of 20°. No postoperative infections or other complication were noted. No reoperations were required/performed during the follow-up period.

Conclusions Open DIP joint cheilectomy is a safe and effective alternative to DIP joint arthrodesis in patients with symptomatic osteoarthritis who wish to preserve joint motion. *(J Hand Surg Am. 2017;■(■):1.e1-e5. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)*

Type of study/level of evidence Therapeutic IV.

Key words Cheilectomy, distal interphalangeal joint osteoarthritis, distal interphalangeal joint arthrodesis.

Osteoarthritis at the distal interphalangeal (DIP) joint often results in pain and deformity.[1] Arthrodesis of the DIP joint is commonly performed for symptomatic osteoarthritis that has not responded adequately to nonsurgical treatment.[2] Although a variety of techniques have been described for DIP joint arthrodesis, the result is a motionless joint.[3–8] A DIP joint fusion also carries the risk of malunion, nonunion, and implant-related complications.[9]

An alternative treatment for symptomatic DIP joint osteoarthritis is debridement and cheilectomy of the DIP joint. This procedure is usually indicated for the treatment of a mucous cyst, which often coexists with degenerative osteoarthritis of the DIP joint.[10] It has been found to be effective in preventing recurrence of

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the cyst while preserving joint motion with a minimum of complications.[10,11] However, it has not been studied as a treatment for patients whose primary complaint is pain and stiffness due to DIP joint osteoarthritis.

The purpose of this study was to determine whether the treatment of symptomatic DIP joint osteoarthritis with open dorsal cheilectomy and DIP joint debridement can result in pain relief while preserving joint motion and avoiding the potential complications associated with DIP joint arthrodesis.

MATERIALS AND METHODS

Between 2000 and 2013, 78 patients with symptomatic degenerative osteoarthritis of the DIP joint were treated with an open dorsal cheilectomy and debridement of the DIP joint. We retrospectively reviewed the data of these patients after obtaining institutional review board approval.

Only patients with symptomatic degenerative osteoarthritis of the DIP joint were included in this study. Patients with less than 24 months of follow-up were excluded (9 patients). There were 70 women and 8 men with a mean age of 64 years (range, 52−74 years). All 78 patients had osteoarthritis of the DIP joint. The procedure was performed on the dominant hand in 59 patients (76%). The middle finger was the most commonly treated (36 patients), followed by the index finger (33 patients), the ring finger (6 patients) and the little finger (3 patients). No patient had more than 1 finger treated. No patient had a swan neck deformity. Preoperative radiographs were graded by the senior author (D.G.S.) using the Kellgren and Lawrence scale for degenerative osteoarthritis as follows: grade 1, normal joint or 1 small osteophyte; grade 2, 2 osteophytes (2 separate osteophytes at the DIP joint; whether from the distal phalanx, the middle phalanx, or both) with minimal subchondral sclerosis with normal joint space and no deformity; grade 3, moderate osteophytes (osteophytes estimated to be average size) with mild deformity and joint space narrowing; grade 4, large osteophytes (osteophytes estimated to be above average in size) and deformity with loss of joint space, sclerosis, and cysts.[1,12] In our series, 44 patients had grade 3 osteoarthritis and 34 patients had grade 4.

The DIP joint cheilectomy was performed in all patients by the senior author (D.G.S.). All procedures were performed with the patient under local anesthesia and sedation with use of a tourniquet. A lazy S incision was made over the dorsal surface of the DIP joint and an arthrotomy was performed on each side of the extensor tendon. The tendon was retracted and debridement of the DIP joint was performed, removing osteophytes with a small rongeur while preserving the terminal tendon insertion. Osteophytes were removed from both the distal and the middle phalanges. Care was taken to preserve the integrity of the terminal extensor tendon during distal phalangeal osteophyte excision. To preserve tendon integrity, some distal osteophytes were not totally excised. Over time, the presence of dorsal osteophytes may lead to attritional disruption of the extensor mechanism.[13] Therefore, after the procedure, the DIP joint was immobilized in extension to allow the extensor mechanism to heal. At 4 weeks after surgery, the orthosis was removed and active and active-assisted range of motion exercises were performed under supervision by a certified hand therapist. Most patients participated in therapy for 4 to 6 weeks.

All patients were evaluated clinically and radiographically following the procedure by the senior author (D.G.S.). The primary outcome measure was pain. Pain level was assessed at the final follow-up using a visual analog scale (VAS), graded from 0 (no pain) to 10 (worst pain). Active range of motion of the DIP joint was assessed at the final follow-up using a goniometer. All patients received pre- and postoperative posteroanterior and lateral radiographs of the finger.

Statistical analysis was performed using the Wilcoxon signed-rank test with the significance level set at .05.

RESULTS

The median final follow-up period was 36 months (range, 24−62 months). No patient was lost to follow-up. Twenty-one of the 78 patients had a concomitant surrounding mucous cyst. All clinical parameters demonstrated statistically significant improvement at final follow-up. Mean patient VAS pain scores improved from 8 before surgery to 1 after surgery ($P < .05$).

The procedure also significantly improved the range of motion of the DIP joint. At final follow-up, patients had a mean DIP joint flexion contracture of 5°, compared with 11° prior to the operation. The DIP joint flexion significantly improved from a mean of 67° before surgery to 75° after surgery ($P < .05$). Total range of motion of DIP joint significantly improved from a mean of 55° to 75° ($P< .05$). Postoperative radiographs demonstrated interval removal of dorsal osteophytes, with persistent radiographic evidence of arthrosis at the DIP joint, as evidenced by loss of joint space, subchondral sclerosis, subchondral