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Time to functional recovery after arthroscopic surgery for tennis elbow

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Background: This study evaluated recovery from chronic lateral epicondylitis after arthroscopic treatment.
Methods: Twenty-three consecutive patients (5 men, 18 women) with chronic lateral epicondylitis underwent arthroscopic surgery. Patients were a mean age of 49 years. Prospective outcome data were collected before the operation and at 1, 2, 3, 6, 12 and 24 months after surgery. Outcomes were assessed using a visual analog scale (VAS: 0-100), grip strength percentage (compared with the unaffected side), the Japanese Orthopaedic Association elbow score, and the Disability of the Arm, Shoulder and Hand questionnaire.
Results: A mean VAS score at rest of 26 preoperatively improved to 8 ($P = .0026$), 6, and 3 at 1, 2, and 3 months after surgery, respectively. A mean VAS score during activity improved from 68 preoperatively to 35 ($P < .001$), 23, and 19 at 1, 2, and 3 months after surgery, respectively. Both VAS scores gradually decreased up to 24 months after surgery. The mean grip strength improved from 66.1% preoperatively to 88.7% at 2 months after surgery ($P < .001$). The mean Japanese Orthopaedic Association elbow score improved from 38 points preoperatively to 61 points at 1 month after surgery ($P < .001$). The mean Disability of the Arm, Shoulder and Hand score improved from 32 points preoperatively to 15 points at 3 months after surgery ($P < .001$).
Conclusion: Arthroscopic surgery for lateral epicondylitis provides significant improvement in pain and functional recovery up to 3 months after surgery. However, it takes more than 6 months for the VAS score during activity to fall below 10 points.
Level of evidence: Level IV, Case Series, Treatment Study.

Keywords: Arthroscopic surgery; tennis elbow; lateral epicondylitis; VAS; grip strength; functional recovery

Lateral epicondylitis, or tennis elbow, is the most common affliction of the elbow.[6,7,10,19] Despite conservative management, approximately 10% of patients may require operative release.[8] A variety of surgical treatments have been described (open, percutaneous, and arthroscopic), and all report good but not definitive results.[1,5,9,11,13,19,20,23,25,27] Arthroscopic techniques have gained in popularity in recent years.[3,4,12,25] In addition to a satisfactory operative result, one benefit of the arthroscopic approach appears to be lower morbidity and earlier return to work and activity. Moreover, arthroscopic surgery allows intra-articular assessment.

The Sapporo Medical University Ethical Committee approved this study.

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Time to return to work after arthroscopic treatment differs among studies. Baker et al[4] and Owen et al[21] reported that the average time to return to work was 6 days and 2.2 weeks, respectively. Grewal et al[12] showed that time taken off work after surgery averaged 19 weeks. Most studies of pain relief and functional recovery after arthroscopic release for lateral epicondylitis involve a minimum follow-up of 2 years,[4,12,25] and Baker et al[3] followed-up patients for up to 14 years. However, none of these studies determined the time at which pain and functional recovery was obtained after surgery.

The purpose of our study was to evaluate pain and functional recovery using a visual analog scale (VAS), grip strength, Disabilities of Arm, Shoulder and Hand (DASH) score, and Japanese Orthopaedic Association (JOA) score for an initial period of 3 months after surgery and continuing for a follow-up of 2 years. Our hypothesis was that arthroscopic release for lateral epicondylitis would require at least 3 months after surgery for pain relief and functional recovery.

Materials and methods

Patients

A single surgeon at our institution (T.W.) performed a consecutive prospective series of 23 arthroscopic surgeries on 23 patients with recalcitrant lateral epicondylitis between February 2008 and April 2010. We undertook a retrospective case-control study of these patients. The prospective data included in this study were obtained as part of the routine care of the patients and were part of their medical record. Because we reviewed the data retrospectively in a deidentified fashion, the Institutional Ethical Committee did not require that the patients provide informed consent.

A clinical diagnosis of lateral epicondylitis was made on the basis of a history of lateral elbow pain that was triggered or exacerbated by wrist extension, with or without specific activity, and point tenderness of the lateral epicondyle. All patients underwent a standard radiographic examination and a preoperative examination by magnetic resonance imaging.

Surgical indications included failure of a minimum of 6 months of conservative treatment such as rest, activity modification, counterforce bracing, nonsteroidal anti-inflammatory medications, and corticosteroid injection. The study excluded patients affected bilaterally, undergoing revision surgery, or with a history of fracture or other elbow disorders. Patients consisted of 5 men and 18 women, with an average age of 49 years (range, 34-67 years). The mean duration of symptoms was 32 months (range, 6-338 months). Affected side and occupation/sports are referred in Table I. There was no patient of worker's compensation. No patients showed restriction of elbow range of motion or evident osteoarthritic changes on roentgenograms. Magnetic resonance imaging showed high signal intensity at the extensor carpi radialis brevis (ECRB) tendon origin in all patients.

Operative technique

Surgery was performed with the patient under axillary block[26] or local anesthesia of the portal sites in combination with general anesthesia.[24] The patient was placed in the lateral decubitus position with a tourniquet on the affected arm over an arm holder. An arthroscopic pump maintained fluid pressure at 35 mm Hg.

The arthroscope was introduced into the joint through a proximal anteromedial portal for anterior viewing. The surgeon established proximal lateral and anterolateral portals for working instruments, with the portals posterior to the radiocapitellar joint consisting of a posterolateral viewing portal and a soft spot working portal.

Operative treatment consisted of an arthroscopic inspection, debridement of the ECRB tendon origin, and resection of the radiocapitellar synovial plica if interposed in the joint. Initial examination of the anterior compartment of the joint revealed 11 type I lesions, 3 type II lesions, and 9 type III lesions of the ECRB origin, according to the criteria of Baker et al.[4] The surgical findings of the radiocapitellar synovial plica, according to Mullett et al,[18] consisted of 3 type 1 variants, 7 type 2 variants, and 13 type 3 variants (Table I). The capsule and degenerative ECRB tendon were resected with a 3.5-mm radius shaver, radiofrequency ablator, and punches until the impingement between the capsule and capitellum was cleared.[23] Tendon debridement was kept to the anterior aspect of the lateral epicondyle to avoid violating the lateral ulnar collateral ligament. In cases in which a synovial plica was interposed in the radiocapitellar joint, it was also debrided. Second, we examined the posterior radiocapitellar joint and debrided the posterior synovial plica until the radial head was fully exposed.

Postoperative care

Active motion was encouraged immediately after surgery. Patients began passive range of motion exercise and grip reinforcement practice at 2 weeks but were restricted to only light work without elbow pain until 4 weeks after surgery. From 4 weeks after surgery, we progressively allowed heavy work and sports to be undertaken.

Outcomes assessment

The authors (G.O. and K.S.) who were not involved in patient care, reviewed the clinical evaluations of all patients performed in the outpatient clinic. Patients visited the clinic at 1, 2, 3, 6, 12, and 24 months after surgery, at which time they assessed their elbow pain at rest and during activity using a VAS scale from 0 (no pain) to 100 (severe pain). Grip strength was also measured at 1, 2, 3, 6 and 12 months after surgery. The patients evaluated their physical condition; and tenderness over the lateral epicondyle, pain with resisted wrist extension, and elbows were rated according to the JOA elbow score for lateral epicondylitis, which consists of the assessment of pain (30 points), function (20 points) and 2 physical findings of lateral epicondylitis (50 points).[25] The Japanese Society of Surgery of the Hand version of the DASH questionnaire[15] was also used before the operation and at 3, 6, 12 and 24 months after surgery. We evaluated patient satisfaction with the operation at the last follow-up by asking the following question: Are you satisfied with your operation? Results were classified as very good, good, no change, and worse.

Patients who were professionally active before surgery were classified at the last follow-up as having not changed their profession, changed their profession, retired, or ceased professional activity. We also calculated the time to the resumption of