Operative treatment improves patient function in recalcitrant medial epicondylitis

M Shahid1,2, F Wu1,2, SC Deshmukh1,2

1Sandwell and West Birmingham Hospitals NHS Trust, UK
2The Royal Orthopaedic Hospital, Birmingham, UK

ABSTRACT
The purpose of this retrospective study was to assess the outcome of open surgery for patients with recalcitrant medial epicondylitis following failed conservative management. The clinical results are presented for 15 patients (17 elbows) who were reviewed at a mean follow-up of 66 months. Operative treatment improved patient function significantly with a mean increase in grip strength of 10kg and a mean decrease (improvement) in DASH (Disabilities of the Arm, Shoulder and Hand) score of 25.7. All but one patient experienced little or no residual elbow discomfort and had excellent Mayo elbow performance scores postoperatively. Eleven of the twelve patients who were previously in employment were able to return to work within eight weeks of surgery. This study demonstrates that operative treatment for recalcitrant medial epicondylitis is effective in restoring patient function and strength.

KEYWORDS
Elbow – Medial epicondylitis – Golfer’s elbow

Accepted 29 June 2013

CORRESPONDENCE TO
Feiran Wu, 37 Thorburn Drive, Liverpool L7 1RB, UK
E: feiran.wu@gmail.com

Epicondylitis is one of the most common disorders of the elbow in adults. Medial epicondylitis, colloquially known as ‘golfer’s elbow’, is much more uncommon than its lateral counterpart, the latter occurring seven to ten times more frequently.1 It usually occurs within the fourth and fifth decades of life with equal male and female prevalence. Seventy-five per cent of patients experience symptoms in their dominant arm.

While many aetiologies have been proposed, the most accepted theory holds that epicondylitis is a result of cumulative microtrauma, leading to macroscopic or microscopic tears at the common flexor tendon. Early descriptions suggested an inflammatory process, which led to the term epicondylitis, although this theory has never been substantiated.2 More recently, Nirschl and Pettrone confirmed histologically that the normal collagen architecture is disrupted by a fibroblastic and immature vascular response, termed angiofibroblastic hyperplasia, with a characteristic paucity of acute and chronic inflammatory cells.3 These findings are considered characteristic of a degenerative process, now commonly known as tendinosis. Consequently, the most current terminology for this condition is epicondyalgia, indicating pain rather than inflammation.

The bulk of the literature on epicondylitis suggests that repetitive stress or overuse is the primary aetiology of this disorder.4 The chronic repetitive concentric or eccentric contractile loading of the involved forearm muscles results ultimately in degenerative changes in the tendons. While non-operative management remains the recommended approach for medial epicondylitis, with a reported success rate of 88–96%,4 operative treatment can be considered in patients when conservative management fails and there is persistent pain after 6–12 months.

Owing to the uncommon nature of this condition, there are few reports that describe the outcomes of surgical management. We hypothesised that open surgical treatment of medial epicondylitis reliably improves patient function and arm strength in those who have failed conservative management. We report on the results of operative treatment on a consecutive series of elbows that had medial epicondylitis.

Methods
A retrospective review was carried out of patients who had operative treatment for medial epicondylitis between September 2005 and May 2010. Approval for the study was granted from the local clinical effectiveness department. A minimum follow-up duration of two years was a criterion for inclusion. Patients who had associated pathology in the ipsilateral arm (eg lateral epicondylitis) were excluded from the study. A total of 19 patients were identified, of which 15 (17 elbows) were available for follow-up assessment (8 male and 7 female patients). The medical records were
Medial epicondylitis was diagnosed on the basis of pain and local tenderness over the origin of the forearm flexors near the medial epicondyle, pain from resisted forearm pronation and pain from resisted wrist flexion. Eight patients had symptoms of ulnar neuropathy with hypoesthesia in the distribution of the ulnar nerve, with seven having a positive Tinel’s sign. All eight patients had nerve conduction studies, which failed to demonstrate ulnar nerve dysfunction.

Preoperatively and at follow-up review, all patients were assessed subjectively for function using the DASH (Disabilities of the Arm, Shoulder and Hand) score—a and objectively for grip strength using a Jamar® dynamometer (Patterson Medical, Warrenville, IL, US). Postoperatively, patients were assessed for pain with a linear visual analogue scale (VAS) score (0 = no pain, 100 = extreme pain) and with the Mayo elbow performance score. This was used to assess pain, motion, stability and daily function. A result was considered satisfactory if an excellent or good rating was attained.

Operative technique
All procedures were performed or supervised by the senior author (SCD). Patients were supine with their arm resting on an arm board. The incision was centred over the medial epicondyle with any exposed cutaneous nerves protected. The common flexor origin was identified and partially detached by sharp dissection. Any pathological tissue was excised. Care was taken not to disrupt the medial stabilising structures and the ulnar nerve. The underlying medial epicondyle was debrided of soft tissue but bone was not removed and no reattachment of muscle was performed. Absorbable sutures were used for closure in the subcutaneous and skin layers. All patients received a soft supportive dressing that was removed at 72 hours. Gentle active mobilisation of the elbow and wrist with physiotherapy support was commenced immediately.

Statistical analysis
Outcome data were assessed using Student’s t-test (parametric data) or the Mann–Whitney U test (non-parametric data). Significance was defined at the 0.05 level.

Results
The mean duration of follow-up was 66 months (range: 25–105 months). Patients experienced a significant functional improvement following surgery demonstrated by a lower (improved) DASH score (mean decrease 25.7). Surgery also improved grip strength significantly, with a mean increase of 10kg. All patients but one were satisfied with their operation. The one who was not remained symptomatic three years following surgery with a VAS score of 50 and a Mayo elbow performance score of 65 (in the fair range). The remaining patients described either no pain or negligible discomfort on the treated elbow with Mayo elbow performance scores in the excellent range (Table 1).

Eight patients had symptoms of ulnar neuropathy preoperatively. These symptoms resolved in all patients following surgery even though the ulnar nerve was not decompressed or transposed during the procedure. There was one postoperative complication of a superficial wound infection that was treated successfully with a course of oral antibiotics.

Of the 12 patients in employment prior to surgery, 11 were able to return to the same job within 8 weeks of the operation. One patient was not able to return to work owing to worsening symptoms of a co-existing lumbar spine pathology, for which he received subsequent spinal surgery.

Discussion
This study demonstrates that surgical treatment of medial epicondylitis following failed conservative management is an effective procedure providing significant improvements in both function and strength. Fourteen (95%) of the fifteen patients experienced a positive outcome, with excellent resultant function and negligible residual discomfort.

There are few studies that report the surgical outcomes of medial epicondylitis. Vangsness and Jobe retrospectively reviewed 55 patients with recalcitrant medial epicondylitis. This study demonstrates that surgical treatment of medial epicondylitis following failed conservative management is an effective procedure providing significant improvements in both function and strength. Fourteen (95%) of the fifteen patients experienced a positive outcome, with excellent resultant function and negligible residual discomfort.

Table 1: Comparison of preoperative and postoperative function and pain

| Measure                        | Preoperatively | Postoperatively | p-value |
|--------------------------------|----------------|-----------------|---------|
| Mean DASH score (range: 24–74) | 42.6           | 12.9            | <0.001  |
| Mean grip strength (kg: SD)    | 27 (SD: 11kg)  | 37 (SD: 11kg)   | <0.001  |
| Mean Mayo elbow performance    | 97 (range: 65–100) | 97 (range: 65–100) | 0.92    |
| Mean VAS score for pain        | 9 (range: 0–50) | 9 (range: 0–50) | 0.27    |

DASH = Disabilities of the Arm, Shoulder and Hand; VAS = visual analogue scale; SD = standard deviation

Reviewed for the results of clinical assessment, investigations and postoperative complications.

The mean duration of symptoms before the operation was 10 months (range: 8–20 months). All patients were treated conservatively with targeted outpatient physiotherapy including the use of splints before surgery for a minimum of six months. Eleven patients received one to three steroid injections (mean 1.9). Two patients had bilateral elbow involvement. Fifteen involved elbows were on the dominant side and two on the non-dominant side. Twelve of the fifteen patients were in employment: five were manual labourers, two were skilled technicians, two were clerical workers, one was a teacher, one was a postman and one was a carer. Of those patients, nine required one or more episodes of time off work owing to their symptoms. All patients had radiographs taken of the affected elbow before surgery, which revealed no abnormalities. The mean age at surgery was 45 years (range: 23–65 years).

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They reported 88% good to excellent results using the Nir-schl and Pettrone grading2 at an average follow-up of six years but no difference in grip strength compared with the contralateral hand. Gabel and Morrey retrospectively reviewed their results of operative treatment of medial epicondylitis in 26 patients using several surgical techniques.4 They noted 87% good to excellent results using a similar grading system. Kurvers and Verhaar retrospectively reviewed 40 patients and noted favourable outcomes only in 25 elbows that did not have co-existent ulnar neuritis.8 In a small series of six patients with percutaneous release of the common flexor origin, Baumgard and Schwartz described 83% with excellent results.9 None of these studies had comparative preoperative outcome measures, however.

The current study supports these findings. All patients improved significantly in function following surgery as demonstrated by a reduction (improvement) in the validated DASH score. Of those in employment, all except one of the patients were able to return to the same occupation within eight weeks.

Both medial and lateral epicondylitis may involve concomitant nerve compression syndromes. The few reports on medial epicondylitis have consistently cited a common association between that lesion and ulnar neuropathy at the elbow, with a prevalence of 23–61%.4 Surgical outcome has not been shown to have a correlation with operative findings. The only parameter that has demonstrated a relationship with the outcome was the degree of involvement of the ulnar nerve. Gabel and Morrey indicated that in the absence of focal compression, treatment of the epicondylitis alone without decompression of the ulnar nerve is sufficient.1 This is confirmed by our study. Eight patients (47%) demonstrated symptoms and signs of ulnar nerve dysfunction but focal compression was not demonstrated by nerve conduction studies. In all patients, these symptoms resolved following surgery.

The mechanism for this improvement is unclear. Gabel and Morrey postulated this is due to the resolution of local inflammation, thereby alleviating the precipitating factor for ulnar neuropathy in these elbows.2 The currently accepted theory, however, is that there is an absence of an inflammatory mechanism in this primarily degenerative condition.2

Grip strength is a well-accepted measure of outcome for conditions such as medial epicondylitis. Previous studies investigating operative treatment of medial epicondylitis have not shown a significant difference in postoperative grip strength between the operated and contralateral arm.7,4 Kurvers and Verhaar doubted its usefulness as an outcome tool, postulating that ongoing ulnar neuritis following surgery was to blame for the lack of significance in grip strength comparisons. Our study compared postoperative with preoperative grip strengths in the same arm, demonstrating a clear and significant improvement. We believe this is a more accurate method of objectively assessing the improvement in arm function and is a valid outcome measure for medial epicondylitis surgery.

We recognise the limitations of this study. The total number of patients was low. However, operative treatment of medial epicondylitis is an infrequently used procedure only indicated in cases of failed conservative management. There is no control group for this study but the retrospective methodology employed is comparable to existing studies, with the addition of preoperative outcome measures for comparison. The demonstration of improvements in both subjective and objective patient function makes this study a useful addition to the current paucity of existing literature on surgical treatment of medial epicondylitis.

Conclusions
Operative treatment of recalcitrant medial epicondylitis is effective in restoring patient function and strength. It can improve patient function and resolve symptoms of ulnar neuritis in those without evidence of focal compression neuropathy.

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