S. Joshy · B. Thomas · S. Ghosh ·
S. G. Haidar · S. C. Deshmukh

Patient satisfaction following carpal-tunnel decompression: a comparison of patients with and without osteoarthritis of the wrist

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Abstract The aim of this study was to assess whether surgical decompression for carpal-tunnel syndrome (CTS) in the presence of primary or secondary osteoarthritis of the wrist is associated with poorer patient satisfaction. We did a retrospective matched cohort study. Twenty-four patients who underwent surgical decompression for CTS secondary to osteoarthritis were identified by reviewing the notes and the radiographs. A control group consisted of 24 patients without osteoarthritis of the wrist who underwent carpal-tunnel decompression. The control group was matched for age, sex, side, and neuro-physiological severity of the nerve compression. In the group with osteoarthritis of the wrist, 17 (71%) patients reported their symptom relief as satisfactory, and 7 (29%) reported the results as unsatisfactory. In the control group, 23 (96%) patients reported their symptom relief as satisfactory, and 1 (4%) reported the results as unsatisfactory ($P=0.0325$). In conclusion, patient satisfaction following surgical decompression in patients with secondary CTS due to osteoarthritis was significantly lower compared to patients without osteoarthritis of the wrist.

Résumé Le but de ce travail, à partir d'une étude rétrospective de 2 groupes appariés est de savoir si la décompression chirurgicale pour syndrome du canal carpien (SCC) en cas d'arthrose du poignet est associée à de mauvais résultats. 24 patients ayant eu cette intervention étaient identifiés sur dossiers et radiographies et comparés avec un groupe de 24 patients, sans arthrose du poignet,

ayant eu la même intervention. Ce groupe de contrôle était apparié pour l'âge, le sexe, le côté, et la sévérité neurologique de la compression. Dans le groupe avec arthrose 17 (71%) patients trouvent le résultat satisfaisant et les 7 autres (29%) le trouve insatisfaisant. Dans le groupe de contrôle 23 (96%) patients sont satisfaits et 1 (4%) est insatisfait ($P=0.0325$). En conclusion la satisfaction des patients opérés pour syndrome du canal carpien secondaire à une arthrose est nettement inférieure à celle ressentie chez les patients sans arthrose.

Introduction

Decompression of the median nerve in carpal-tunnel syndrome (CTS) generally gives good patient satisfaction [9, 14–16]. There are several factors that are known to influence the outcome of the surgery. These factors include age, duration of symptoms, alcohol use, mental-health status, and presence of objective neurological deficit [2, 4–7, 11–13].

Osteoarthritis of the wrist is a well-recognised factor associated with carpal-tunnel syndrome [3]. The aim of the study was to assess whether surgical decompression for CTS in the presence of primary or secondary osteoarthritis of the wrist is associated with poor patient satisfaction.

Materials and methods

We carried out a retrospective matched cohort study. Clinical records and radiographs of all the patients who underwent carpal-tunnel decompression (CTD) under the senior author (S.C.D.) over a period of 8 years (April 1997–March 2004) were identified from the computerised hospital database. There were a total of 463 carpal-tunnel decompressions carried out by the senior author in that period. The inclusion criterion for the study group was accompanying clinical and radiological evidence of osteoarthritis of the wrist. In addition to this, all patients had neuro-physiological evidence of carpal-tunnel syndrome. The clinical diagnosis

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S. Joshy · B. Thomas · S. Ghosh ·
S. G. Haidar · S. C. Deshmukh
Trauma and Orthopaedics, City Hospital,
B18 7QH Birmingham, UK

S. Joshy (✉)
27 Waun-Y-Groes Road,
Cardiff, CF14 4SW, UK
e-mail: surajjoshy@yahoo.com
Tel.: +44-2920-624423

of osteoarthritis was based on the presence of pain in the wrist, tenderness of the wrist, evidence of synovitis and restricted range of movement of the wrist. We excluded patients with diabetic neuropathy, double crush syndrome, hypothyroidism and previous carpal-tunnel decompression from the study group. There were 24 patients who met the above criteria.

Control group consisted of 24 patients who underwent carpal-tunnel decompression without any associated local or systemic abnormality. The control group was matched for age, sex, side, and neuro-physiological severity of the nerve compression in order of priority.

The neuro-physiological severity was graded mild, moderate or severe (Table 1). The osteoarthritis was graded radiologically as mild, moderate and severe using a modification of the Kellegren-Lawrence grading system [8] (Table 2).

All patients underwent the procedure under local anaesthesia under tourniquet control. Single-incision open technique was used for all patients. Patients were discharged on the day of operation and were followed up at 2 weeks for removal of sutures. A final follow-up was done 2 months after the surgery.

The outcome following surgery was assessed by direct questioning to see if the patients were satisfied or not with regards to post-surgical symptom relief. This was carried out at the follow-up clinic 2 months after the surgery.

Results

The mean age of the study group was 70.2 years (range 33–89 years). There were 19 females and 5 males. The right side was involved in 17 patients and the left in 7. Nine patients had mild osteoarthritis, seven had moderate osteoarthritis, and eight patients had severe osteoarthritis based on the classification system used. Based on the neuro-physiological grading, 11 patients had severe CTS, 7 patients had moderate CTS, and 6 patients had mild CTS. The control group without osteoarthritis also had similar distribution regarding age, sex, side, and neuro-physiological severity of nerve conduction.

In the group with osteoarthritis of the wrist, 17 (71%) patients reported their symptom relief as satisfactory, and the rest, 7 (29%), reported the results as unsatisfactory. In the control group, 23 (96%) patients reported their symptom relief as satisfactory, and 1 (4%) reported the result as unsatisfactory. We used exact binomial test for analysing the statistical significance. There was a statistically significant difference in patient satisfaction as compared to the control group ($P=0.03125$).

Of the 24 patients with osteoarthritis of the wrist, 15 patients had previous significant injury to the wrist predisposing to osteoarthritis. Of the 15 patients with previous injury, 10 patients had mal-united distal radius fracture, 1 patient had scaphoid non-union and 4 had chronic ligamentous injury to the wrist.

Out of the 11 patients with severe neuro-physiological evidence of CTS, 3 patients had poor patient satisfaction. Two patients each from the mild and moderate CTS groups had poor patient satisfaction. There was no significant difference in patient satisfaction based on the severity of CTS.

Discussion

Carpal-tunnel decompression usually gives satisfactory symptom relief in properly selected patients [9, 14–16]. Many studies show very high rates of symptom relief and patient satisfaction following CTD [9, 14–16]. But there are a number of factors associated with poor outcome and patient satisfaction following carpal-tunnel decompression. These factors include diabetes, high age, double crush syndrome, and severity of preoperative symptoms [2, 4–6, 11–13]. General factors associated with poor satisfaction are alcohol abuse, poor mental-health status and involvement of a lawyer [3, 7].

Following carpal-tunnel decompression there is immediate relief of symptoms. Early symptomatic relief after decompression is a good predictor of a better long-term outcome [1]. This symptom relief can be correlated to patient satisfaction both in the short and long terms.

We used patient satisfaction at the final follow-up visit as the assessment tool for outcome. Since the pain from the entrapment is relieved by decompression, symptom relief immediately after the surgery could be primarily attributed to decompression. We found a significantly low satisfaction rate in patients with osteoarthritis of the wrist.

Patients with carpal-tunnel syndrome and underlying osteoarthritis of the wrist can have pain due to osteoarthritis itself and neurological symptoms of pins and needles and numbness due to the entrapment neuropathy of the median nerve. One of the reasons for lower patient satisfaction could be because patients may be confusing the arthritic pain with the pain due to entrapment of the median nerve.

The anatomical configuration of the carpal tunnel is that of an inelastic channel [10]. Consequently, any increase in its volume or alteration in shape will usually result in a significant increase in interstitial pressure. At a pressure threshold of 20–30 mm Hg, epineurial blood flow is compromised [10]. When that pressure is sustained, the symptoms and physical findings associated with CTS

Table 1 Neuro-physiological classification of the severity of carpal-tunnel syndrome

Severity	
Mild	Normal motor latency of abductor pollicis brevis (<4 ms), sensory conduction velocity >50 m/s
Moderate	Motor latency >4 ms, sensory conduction velocity >50 m/s
Severe	Motor latency >4 ms, sensory conduction absent

Table 2 Radiological classification of the severity of osteoarthritis

Severity	
Mild	Osteophytes present, unimpaired joint space
Moderate	Moderate diminution of joint space
Severe	Joint space greatly impaired, sclerosis of subchondral bone

appear. The increase in interstitial pressure in the carpal tunnel is, in the vast majority of cases, idiopathic. It can also be caused by a myriad of other conditions that can be classified into three categories: intrinsic factors that increase the volume of the tunnel (outside and inside the nerve), extrinsic factors that alter the contour of the tunnel, and repetitive/overuse conditions [10].

In osteoarthritis of the wrist due to chronic ligamentous injury, there is carpal collapse. Carpal collapse may contribute to significant reduction in carpal volume, which may not be completely relieved by carpal-tunnel decompression. This could be one of the reasons for the continuing pain and poorer patient satisfaction in this group of patients.

Our study had the inherent limitation of retrospective studies. Recording of a symptom severity score before and after operation could have given more conclusive results.

Based on this study we infer that surgical decompression for CTS secondary to osteoarthritis of the wrist is associated with poorer patient satisfaction compared to patients without osteoarthritis of the wrist. We now routinely advise patients undergoing CTD for CTS secondary to osteoarthritis about the relatively higher incidence of poor outcome. Based on this study we recommend that prospective studies incorporate assessment of functional outcome in patients with CTS associated with osteoarthritis of the wrist.

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