

MANAGEMENT OF CARPAL TUNNEL SYNDROME IN MORECAMBE BAY

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The traditional way of managing a painful and disabling condition is inefficient and wasteful of resources. The rheumatology team at the Royal Lancaster Infirmary has a new way of managing carpal tunnel syndrome.

Carpal tunnel syndrome (CTS), due to compression of the median nerve at the wrist, is the commonest of the entrapment neuropathies. It has a female preponderance, prevalence of 3-7%⁽¹⁾ and is one of the commonest reported occupational diseases⁽²⁾. As a result, it impacts heavily on musculoskeletal services and also economically due to work absenteeism and loss of recreational activities^(3,4,5).

Despite its impact on healthcare resources, there are no nationally agreed management guidelines available. In the absence of these guidelines local management strategies are often influenced by local resources⁽⁶⁾, such as access to nerve conduction studies (NCS), and practice may not necessarily reflect what is judged to be best practice by clinicians in other centres^(6,7).

NCS are generally accepted to be the gold standard investigation in a patient with a classic clinical presentation of paraesthesiae in a median nerve distribution with nocturnal exacerbation^(8,9).

It is generally considered that surgical decompression of the median nerve is the treatment of choice for moderate to severe CTS. Conservative measures, with splinting and/or corticosteroid injection, are of value in mild cases⁽⁷⁾. The most effective non-surgical technique is yet to be elucidated⁽⁸⁾.

In Morecambe Bay, secondary care management of CTS has been shared between orthopaedics and rheumatology. Referral guidelines were agreed between primary care,

orthopaedics and rheumatology for common musculoskeletal conditions in 2001. These included CTS guidelines that are available to all general practitioners (GPs) on the local intranet. These guidelines propose a referral and management pathway that is dependent on the severity of symptoms and the presence of features suggestive of a secondary inflammatory cause (figure 1).

GPs are encouraged to consider other secondary causes and to offer patients a trial with a wrist splint and or local steroid injection prior to referral.

Following referral to secondary care, subsequent management is largely based on clinician preference, in the absence of evidence-based guidance. Traditionally, patients referred to rheumatology with suspected CTS have the diagnosis confirmed by NCS and are then referred to orthopaedics for surgical intervention. GPs do not have direct access to NCS and thus rely on secondary care referral to confirm the diagnosis.

In the current climate of reducing waiting lists and improving access to diagnostics for primary care it is vital to assess shortfalls in current services and determine where improvements can be made. This is especially the case for a condition such as CTS, whose management is potentially straightforward but currently inefficient due to the heterogenous non-standardised practice.

Since the introduction of local CTS management guidelines, their efficiency and effectiveness have not been studied.

The aims of this study were to:

- determine adherence to local guidelines in patients with suspected CTS
- compare orthopaedic and rheumatology management of CTS
- assess the efficiency of the service

METHODS

New referrals with suspected CTS to the orthopaedic and rheumatology departments at Lancaster, Barrow and Kendal, for a period of 11 months from May 2001, were identified from a database⁽¹⁰⁾.

The authors performed a retrospective casenote review and obtained demographic details and outcomes for these patients. The statistical package *STATA® Version 8* and *Microsoft Excel®* were used for mathematical calculations and statistical analysis.

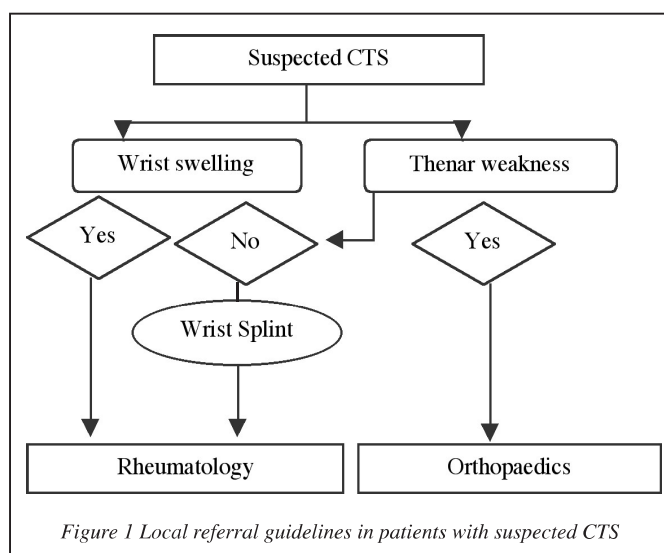


Figure 1 Local referral guidelines in patients with suspected CTS

RESULTS

Of the 6,068 new patient referrals, 255 (4.2%) cases with suspected CTS were identified and 238 were included in this study.

Patient demographics and clinical features are shown in table 1 and concur with other epidemiological data⁽¹¹⁾.

Age*	53 yr (24-91)
Sex Ratio (F:M)	2:1
Length of symptoms*	52 wks (1-1040)
Bilateral symptoms	52 %

*Table 1 Patient demographics (*Median and range)*

As part of the assessment of the adherence to the guidelines, we determined how frequently secondary causes were investigated by primary or secondary care. Nineteen per cent of patients underwent investigations, including full blood count, thyroid function test, glucose and rheumatoid factor. Cervical spine radiographs were requested in 10% of patients, presumably to seek evidence of cervical spondylosis.

In primary care, only 18% of cases had a trial of wrist splints. Referral to the appropriate department, in accordance with the guidelines, was achieved in 32% of referrals. It was the expectation that only patients with moderately severe CTS should be referred to orthopaedics. In fact, 80% (190) of cases were referred to orthopaedics and 20% (48) to rheumatology.

The number of patients receiving splints, injections and surgery differed between rheumatology and orthopaedics. In total, 31% of all the patients received wrist splints, 21% were given local steroid injection and 64% had surgical decompression. Differences in the frequency of interventions between the departments are highlighted in table 2. It is noted that patients seen by rheumatology were more likely to have been offered conservative measures prior to surgery, whereas patients seen by orthopaedics were more likely to be undergo surgery as first line management.

	Rheumatology (%)	Orthopaedics (%)
Wrist splint	33	10
Corticosteroid injection	23	8
Nerve conduction studies	71	48
Surgery	48	69

Table 2 Frequency of interventions in orthopaedic and rheumatology departments

NCS were performed in 59% (140) of the cohort and were requested more often by rheumatology (71%) than orthopaedics (48%). NCS were performed in only 57% (87) of cases treated surgically.

The response to conservative treatment was examined. In those patients provided with wrist splints, 54% (30/55) had documented evidence of partial response. Complete relief occurred in one patient only.

After corticosteroid injection temporary symptom relief was achieved in 61% (17) of patients. Seventy-three per cent of these went on to have surgical release despite injection therapy.

To assess how the heterogeneity of management impacts on local musculoskeletal services, the median number of

secondary care consultations and the mean time taken for a patient to complete management were determined. The mean waiting time for a new consultation from referral was 10 weeks for orthopaedics and 13 weeks for rheumatology services. The mean wait for NCS was 8 weeks from referral.

Once seen in secondary care, the time taken for those proceeding to surgery was largely dependent on the referral pattern. Some patients seen in orthopaedics were directly listed for surgery after the first consultation, without confirmatory NCS, and waited a mean of 15 weeks, with a median of two routine hospital appointments. Orthopaedic patients who had confirmatory NCS requested prior to surgery waited on average 25 weeks for surgery and had a median of four hospital appointments, where NCS were not included as a consultation.

In those patients referred to rheumatology, a minority were directly listed for surgery following NCS. They waited a mean average of 33 weeks and had three appointments. However, for the majority of patients seen in rheumatology, a direct listing service was not available and these patients were referred to an orthopaedic clinic for a surgical opinion. On average, these patients waited 43 weeks for surgery from their first appointment in secondary care and had four hospital appointments. The differences in duration between departments were highly significant ($p < 0.001$) and are highlighted in table 3.

		Mean time to surgery in weeks	Median number of hospital appointments (range)
Orthopaedics	Directly listed for surgery without NCS	15	2 (2-8)
	Listed for surgery following NCS	25	4 (2-8)
Rheumatology	Listed for surgery following orthopaedic review	43	4 (3-6)
	Listed for surgery without orthopaedic review	33	3 (1-3)

Table 3 Comparison of time taken from first secondary care assessment to surgery and median number of outpatient appointments in rheumatology and orthopaedic departments

DISCUSSION

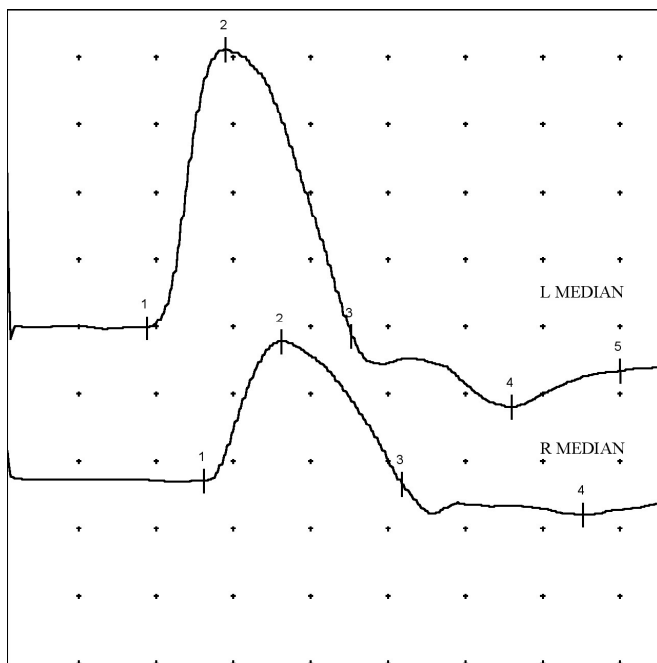
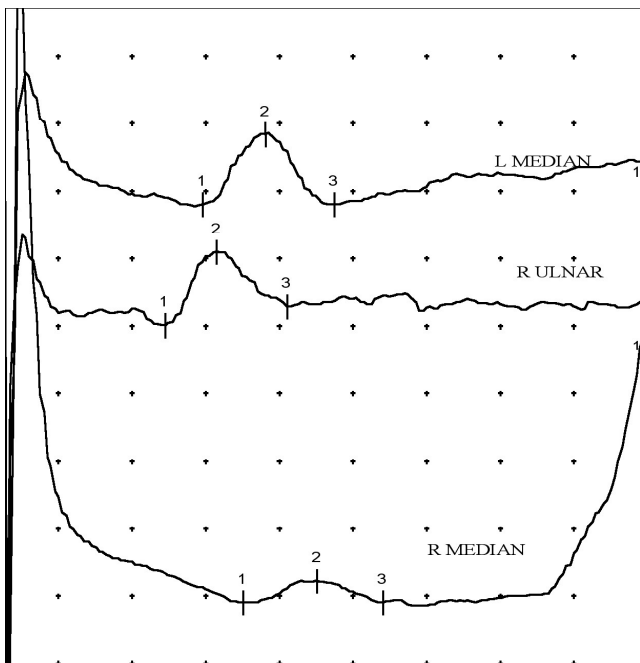
Morecambe Bay has a population of 308,195. Based on Bland's annual incidence figures of 139.4 (per 100,000) in women and 67.2 in men, in our population approximately 320 new cases of CTS would be expected per year⁽¹¹⁾. The number of CTS referrals during this study suggests that the majority of patients are referred to secondary care.

This study has highlighted a number of shortfalls in CTS management in both primary and secondary care. We have confirmed that the uptake of conservative measures in primary care is low and that the use of wrist splints and local corticosteroid injections should be actively encouraged, as these are simple cost effective interventions of proven benefit which may avoid the need for surgical intervention in mild to moderate cases⁽¹⁾.

The laboratory confirmation of carpal tunnel syndrome is based on nerve conduction studies as demonstrated below. Sensory and motor components of the mixed nerve are separately examined. This example shows sensory delay and median motor delay at the right wrist, with a decreased amplitude of sensory response. The diagnosis of carpal tunnel syndrome is confirmed.

Sensory Nerve	Sites	Peak ms	Peak Amp μV
L MEDIAN - Dig II	1. Wrist	3.80	5.2
R ULNAR - Dig IV	1. Wrist	3.50	4.9
R MEDIAN - Dig II	1. Wrist	5.10	1.5

Motor Nerve	Sites	Lat ms	Amp mV	Amp %	Dist cm	Vel m/s
L MEDIAN - APB	1. Wrist	3.75	4.2	100	8	55.9
R MEDIAN - APB	2. Wrist	5.25	2.1	50.3	8	50.4



Courtesy of Dr Marie O'Donnell and colleagues

The effectiveness of treating CTS with local steroid injection therapy has been confirmed in a recent publication⁽⁷⁾, which concluded that, in the short term, injection therapy was better than surgical decompression for symptomatic relief, and at one year injection therapy was as effective as surgery.

Although steroid injection therapy is traditionally a secondary care led intervention, there is the scope for this to be performed by primary care physicians with an interest in musculoskeletal conditions, after suitable training. By increasing the use of these conservative measures in primary care it seems probable that the number of hospital referrals for CTS could be reduced.

Secondary care management is heterogeneous, not only between rheumatology and orthopaedics, but also within specialities. For example, some orthopaedic surgeons choose to perform surgery without confirmatory NCS, whilst others who requested NCS choose to review patients following these results before listing them for surgery. In the majority of patients referred to rheumatology who required surgical treatment a further referral to orthopaedics was made before they were listed for surgery.

This current management increases the number of clinic appointments and results in a significantly delay for surgery. This is reflected in the differences between patients seen in rheumatology and orthopaedics who required surgery. Rheumatology patients waited on average 43 weeks and had a median of four clinic appointments whereas orthopaedic patients undergoing NCS and surgery waited 25 weeks and had a median of three appointments. From this study we can conclude that our current management of this simple

condition is inefficient and uneconomical, both on NHS resources and lost working days for patients.

RECOMMENDATIONS

As a result of this study the following measures are recommended:

1. Encourage the use of wrist splints in all patients presenting with CTS and consider local steroid injection prior to referral to secondary care.
2. Perform a pilot study to allow GPs direct access to NCS for suspected CTS according to agreed clinical criteria.
3. Provide a surgical direct listing facility for GPs and rheumatologists according to agreed protocol.

It is accepted that some of these proposals could raise concerns about the management of CTS, as they are contrary to current practice. This study has, however, demonstrated inefficiencies and unnecessary delays in the current management of CTS that justify revised management guidelines. The proposal to allow direct access to NCS for primary care in accordance with agreed guidelines and also direct listing for surgical treatment of confirmed cases that have failed to respond to conservative management has the potential to be more cost and time efficient and reduce the workload of overstretched secondary care resources. It is anticipated that the existing NCS have the capacity to cope with this change in referral pattern; however, this situation will need to be kept under review.

The provision of clear clinical referral guidelines for cases with suspected CTS will reduce the likelihood of inappropriate referrals. In cases with atypical hand sensory symptoms, referral to musculoskeletal services for further assessment would still be entirely appropriate and at the discretion of the referring physician.

These proposals are entirely in keeping with the recommendations of the recently published white paper⁽¹²⁾, which encourages the management of common conditions in primary care.

A pilot study to establish the effectiveness of these new proposals is currently underway and will be the subject of review and audit in the future. We also await national management guidelines, which would ensure a more standardised, efficient and evidence-based approach to our service.

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