CURRENT PRACTICE IN THE USE OF NERVE CONDUCTION STUDIES IN CARPAL TUNNEL SYNDROME BY SURGEONS IN THE NETHERLANDS

F. CLAES, W. I. M. VERHAGEN and J. MEULSTEE

From the Department of Neurology and Neurophysiology, Canisius-Wilhelmina Hospital, Nijmegen, The Netherlands

The current practice in and the opinion about the treatment of carpal tunnel syndrome by surgeons in the Netherlands was evaluated in respect of the extent to which electrodiagnostic studies are used or needed to confirm the diagnosis. Questionnaires were sent to all Dutch surgeons who operate on patients with carpal tunnel syndrome. The response rate was 47% (324 out of 686). The majority of neurosurgeons and orthopaedic surgeons seldom operate without electrodiagnostic confirmation in line with the Dutch consensus guideline on this subject. In contrast, plastic surgeons operate more often on patients with clinically defined carpal tunnel syndrome even with normal electrodiagnostic studies. Knowledge of these strikingly different diagnostic and therapeutic strategies and opinions may influence diagnostic and referral behaviour of clinical neurologists and others.

Journal of Hand Surgery (European Volume, 2007) 32E: 6: 663–667

Keywords: carpal tunnel syndrome, surgery, questionnaire

Carpal tunnel syndrome (CTS) causing compression of the median nerve within the carpal tunnel is the most common entrapment neuropathy. The clinical diagnosis is based on a history of pain, paraesthesiae and numbness in the palmar surfaces and tips of the fingers innervated by the median nerve. Various clinical tests are available to help make a diagnosis. However, these are not very specific (D'Arcy and McGee, 2000; De Krom et al., 1990; Massy-Westropp et al., 2000; Rempel et al., 1998). Unfortunately, a gold standard for the diagnosis CTS does not exist and, often, electrodiagnostic studies are performed to help confirm the diagnosis.

However, there exists a significant body of patients with typical complaints of CTS, in whom electrodiagnostic studies are negative. In the second literature review published by the American Association of Electrodiagnostic Medicine (Jablecki et al., 2002), it was concluded that median sensory and motor nerve conduction studies confirm a clinical diagnosis of CTS with a sensitivity of more than 85%. This identifies that the tests are not absolute in allowing a diagnosis of this condition to be made.

In the Netherlands, patients with CTS complaints are often seen initially by a neurologist. When CTS is diagnosed, both clinically and electrodiagnostically, and an operation is indicated, the neurologist refers the patient to a surgeon. In general, CTS surgery is performed by neurosurgeons, orthopaedic surgeons and plastic surgeons. In addition, an undetermined number of CTS patients are referred to a surgeon directly by their general practitioner. Recently, the Dutch Institute for Healthcare Improvement (2006) (CBO), published a consensus guideline on treatment of CTS (CBO guideline, 2006). The Dutch Associations of Neurology, Surgery, Plastic Surgery and Neurosurgery all participated in the development of this guideline. In this consensus guideline, the advice was to perform an open release of the carpal tunnel only when electrodiagnostic tests have confirmed the clinical diagnosis of CTS. When electrodiagnostic studies are normal, conservative treatment was recommended.

With the controversies existing about the need for electrodiagnostic studies confirming the diagnosis of CTS, it would be interesting to know the opinion of surgeons operating on patients with CTS.

The objective of this study was to evaluate the opinion of different surgical disciplines in regard of the need for electrodiagnostic testing for confirmation of the diagnosis CTS and to what extent patients with clinically defined CTS without electrodiagnostic confirmation are still operated on.

MATERIALS AND METHODS

To evaluate the current practice in planning surgical treatment of clinically defined CTS by surgeons, with or without the use of electrodiagnostic studies to confirm the diagnosis, a questionnaire (Table 1) was sent to neurosurgeons, orthopaedic surgeons and plastic surgeons in the Netherlands. The surgical departments of all hospitals in the Netherlands were targeted. A stamped and addressed return envelope was included. Eventually, 686 surgeons received the questionnaire personally. Among them were 110 neurosurgeons, 417 orthopaedic surgeons and 159 plastic surgeons.

The questionnaire assessed the number of patients tested electrodiagnostically and the number of patients on whom surgery for CTS was carried out by the surgeons, or residents supervised by them. The next

Table 1—The questionnaire sent to Dutch surgeons

1. How many patients with carpal tunnel syndrome do you operate on each year?					
0–50	51–100	101–150	151–200	201–250	251–300
301–350	351–400	401–450	451–500	more than 500	
2. How many of these patients do you operate on yourself and how many are being operated on by residents under your supervision?					
Yourself (%)		Supervision (%)			
3. How many of these patients underwent electrodiagnostic studies?					
0–20%	21–40%	41–60%	61–70%	71–90%	91–95%
96–100 %					
4. Do you operate on patients with typical CTS complaints, but normal electrodiagnostic studies and no response to conservative treatment?					
never	Seldom	Often	always		
5. Do you operate on patients with typical CTS complaints, but normal electrodiagnostic studies and temporary relief from corticosteroid injection?					
never	seldom	often	Always		
6. Do you operate on patients with typical CTS complaints without electrodiagnostic confirmation?					
never	seldom	often	always		
7. Your profession is:					
Neurosurgeon	Plastic surgeon	Orthopaedic surgeon	General Surgeon		

questions assessed the likelihood one would operate on CTS patients in different possible subsets.

In general, carpal tunnel release in the Netherlands is performed most frequently by neurosurgeons, followed by plastic surgeons and orthopaedic surgeons. Most orthopaedic surgeons are general orthopaedic surgeons, operating also on CTS patients.

RESULTS

Three hundred and twenty-four of 686 questionnaires were returned, which is a response rate of 47%. We chose to send questionnaires anonymously, with the regrettable consequence of not being able to send a reminder letter to increase the response rate.

Among the responders there were 62 of 110 neurosurgeons (56%), 165 of 417 orthopaedic surgeons (40%) and 97 of 159 plastic surgeons (61%). Thirty-seven surgeons returned an incomplete questionnaire, because they did not operate on patients with CTS. Of these, 30 were orthopaedic surgeons. These questionnaires were not included in the analysis.

Thirty-one percent of neurosurgeons stated they operated on 150 or more patients a year, or this number of patients were being operated on under their supervision. For orthopaedic surgeons and plastic surgeons these percentages were 7 and 15, respectively.

In the whole group, 64% of surgeons stated that 96% to 100% of their patients with complaints suggestive of CTS underwent electrodiagnostic studies. For neurosurgeons, orthopaedic surgeons and plastic surgeons, these percentages were 90%, 68% and 39%, respectively. One surgeon did not answer this question.

Fifty-seven percent of all surgeons seldom, or never, operated on patients with clinically definite CTS, normal electrodiagnostic studies and failing conservative treatment. For neurosurgeons, orthopaedic surgeons and plastic surgeons these percentages were 61%, 81% and 14%, respectively. All surgeons answered this question.

Fifty-five percent of all surgeons seldom, or never, operated on patients with clinically definite CTS, normal electrodiagnostic studies and only temporary relief of symptoms from corticosteroid injection(s). For neurosurgeons, orthopaedic surgeons and plastic surgeons, these percentages were 53%, 72% and 27%, respectively. All surgeons answered this question.

Eighty percent of all surgeons seldom, or never, operated on patients with a clear history of CTS without confirmation of the diagnosis by electrodiagnostic studies. For neurosurgeons, orthopaedic surgeons and plastic surgeons, this percentage was 92%, 88% and 59%, respectively. Twenty-five surgeons (8%) did not answer this question.

A complete overview of the results is given in Table 2.

DISCUSSION

In the literature, opinions differ about the need for electrodiagnostic confirmation of CTS. In a study by Finsen and Russwurm (2001), 68 patients with typical CTS underwent open carpal tunnel release. They all underwent electrodiagnostic studies, but these were not assessed until the end of the study. Sixty-three of the 68 patients responded well to surgery, 14 of these had normal electrodiagnostic studies. These authors concluded that electrodiagnostic studies contributed little to the diagnosis in typical cases of CTS and might confound more than help.

Other studies suggest that electrodiagnostic studies may have an important role in predicting the outcome of