The long-term post-operative electromyographic evaluation of patients who have undergone carpal tunnel decompression

O. Faour-Martín, M. A. Martín-Ferrero, A. Almaraz-Gómez, A. Vega-Castrillo

Carpal Tunnel Syndrome (CTS) is the most common entrapment neuropathy. The prevalence of CTS is quoted between 1.3 to 3.8%.1,2 Despite the relative ease with which the condition can be diagnosed clinically, nerve conduction studies (NCS) have classically formed an important part of the diagnostic armamentarium. This has many contributing factors. Firstly, CTS is frequently diagnosed in primary care by family doctors who may have an increased reliance on NCS. Secondly surgeons from various backgrounds (hand surgeons, orthopaedic surgeons, plastic surgeons, neurologists and neurosurgeons) get involved in the diagnosis and treatment of CTS. The background of the individual doctor or surgeon can have an impact on the frequency with which the clinician deals with CTS.3 Finally, NCS have been seen as a means of objective confirmation of the diagnosis (gold standard) and thereby as a protection against medical negligence lawsuits in case of suboptimal outcome after treatment or complications. In some cases recommendations have been published by professional bodies recommending routine preoperative use of NCS. 4

Most studies to date are in agreement that the surgical outcome is not altered by the presence of NCS. This may be interpreted in two ways. Firstly most authors agree that surgical decompression should be performed in a typical case of CTS regardless of the NCS findings, i.e. even if these are completely normal.5,6 This is because surgery is equally effective in achieving symptom resolution despite normal NCS.7,8 Secondly, pre-operative symptom severity does not seem to relate to NCS findings.9 The final question is: Does post-operative symptom improvement reflect itself in the postoperative NCS?

This is where the present paper makes an important impact. All patients in the study had an abnormal NCS prior to surgery. At ten years post-surgery 58% of patients with no symptoms still had an abnormal NCS. This ratio was 82% for patients with symptoms. The authors found this difference statistically significant. However it shows that NCS results may diverge as significantly from clinical findings post-operatively as they do pre-operatively. Normal NCS in clinically manifested CTS has been reported to be around 25%. In this study a similar ratio (18%) is reported for recurrent cases. It is no surprise that the clinician faced with such dichotomy may find it hard to make a judgement about the best treatment. In the case of first presentation, should or should one not operate on cases with negative NCS? How would one justify the operative intervention should no resolution of symptoms be subsequently forthcoming? What is the role of NCS in cases of unsuccessful outcome following surgery considering the 58% positivity in patients with complete resolution of symptoms? Can NCS help the clinician to make a more informed decision about re-release in recurrent CTS considering almost 60% of patients free of symptoms exhibit positivity on NCS?

The questions are varied and the answers unclear. Yet, the vast majority of patients don’t just get better after carpal tunnel release. They get significantly better. Patients frequently report that they had their first uninterrupted sleep after a long time on the first post-operative night. They often describe it as “magic”. It is a life changing event to be able to tell again what they are holding, to feel the shapes and textures of items without looking at them. It is liberating not to drop cups and mugs and to be able to hold a knife and fork properly. The examples go on and on. Carpal Tunnel Release (CTR) has a success rate of over 90% with a complication rate under 3%. This is in stark contrast to the improvement one would get with conservative treatment. 10 CTR comes in at the top of cost-effectiveness - together with cataract surgery, costing only about US$200/QALY (Quality Adjusted Life Year).11,12 If one were to withhold surgical treatment on the basis of normal NCS results it is estimated that approximately 13% to 22% of patients would be denied surgical treatment.13,14

The clinical diagnosis of CTS can be standardised using a questionnaire such as described by Levine et al15 and clinical criteria as described by Graham et al.16

There is a need for further research to establish whether refining the neurophysiological techniques may improve the capture of clinically relevant information pre- or post-operatively. It is encouraging to see such improvements may be forthcoming.17 Extended studies are however generally performed in the research domain rather than routine clinical practice and the realities of today’s health economics may preclude the introduction of these techniques into daily use. It can therefore be said with some certainty that there does not currently seem to be any justification to direct treatment of CTS on the basis of NCS, neither primarily nor in the case of recurrence.

Erman Melikyan, FRCS, European Diploma of Hand Surgery Hand and Orthopaedic Surgeon, Honorary Clinical Lecturer, University Hospital Southampton, UK emelikyan@hotmail.com

References