Nerve sliding and conduction velocity

Sir,—The papers by McLellan and Swash\(^1\) and Nobel\(^2\) suggested the importance of nerve sliding in clinical syndromes of injury. The amount of nerve sliding was measured, however, with percutaneous needles on living subjects in the first paper, directly on necropsy specimens in the second. I wish to report an electrodiagnostic confirmation of the findings of McLellan and Swash\(^1\) that was performed on living subjects and was not subject to mechanical damping.

Twelve median nerves in seven normal volunteers, six males, one female, aged 22 to 33 years, without history or symptoms of carpal tunnel syndrome, were examined. Sensory latencies to peak using ring type finger pickup electrodes which remained in place throughout the studies and a hand held stimulator applied to marks on the skin from the wrist and elbow to the index finger with the hand and wrist at 0° were determined to the nearest 0·05 ms and the sensory nerve conduction velocity (NCV) calculated using the distance over the forearm segment. Sensory latencies to peak from the elbow with the hand and wrist in full passive extension and full active flexion short of touching fingers to palm were determined, these positions being held just long enough to record a response, and the differences in these values, multiplied by the NCV previously determined over the forearm segment, resulted in a figure for distance of nerve slide at the elbow. Relaxed positions of the hand and wrist and changes in neck position were tried. In all cases, wrist and finger extension resulted in a longer latency, up to 0·5 ms, than flexion. These calculated into slides of up to 2·8 cm with an average of 1·8 cm. Positions of relaxation yielded latencies ≤0·1 ms different from those with the hand and wrist at 0°, and no change could be noticed with neck motion.

The facts that McLellan and Swash\(^1\) were able to detect very small amounts of sliding, such as those associated with deep inspiration, while we could not (yet our average slide for hand extension/flexion was twice theirs, 1·8 cm vs 0·9 cm), are not inconsistent. Their measurements were direct and continuous, so small changes were easily seen. Ours were indirect (latency converted to distance) and discontinuous, and since differences of less than 0·1 ms are difficult to measure on the fibreoptic write-out or directly on the oscilloscope, movements of less than about 0·5 cm are also difficult to measure. The large slides we saw with certain movements were greater than those recorded by McLellan and Swash\(^1\) probably because our technique did not impede nerve sliding, while the motion of the percutaneous needles used by McLellan and Swash\(^1\) must certainly have been damped by non-sliding tissues. The nerve also probably slid slightly less at the mid-arm position they used. Our study suggests that changes in limb position during NCV measurements may result in errors of about 2%. A statistical analysis of more data may be made to see whether this is a matter of clinical concern.

References


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