ELECTROPHYSIOLOGIC CORRELATES OF ANOMALOUS COURSE OF THE MEDIAN-NERVE THENAR MOTOR BRANCH

We report the case of a right-handed 67-year-old uremic woman with severe left carpal tunnel syndrome (CTS) in whom preoperative neurophysiologic data suggested that the thenar motor branch (TMB) of the median nerve ran an anomalous course that was confirmed during surgical release. The patient had undergone periodic hemodialysis for 10 years through a vascular graft at the left forearm. The patient presented with a 2-month history of severe paresthesias, pain, and mild edema of the left hand.

Electrophysiologic investigation disclosed absent sural sensory nerve action potentials (SNAP) and reduced radial and ulnar orthodromic sensory conduction velocities and SNAP amplitudes bilaterally (52 m/s, 2 µV and 30 m/s, 1 µV). Peroneal and tibial motor conduction studies and needle electromyography of the tibialis anterior muscles were normal, but electromyography of the foot extensor digitorum longus muscle showed slight chronic neurologic findings bilaterally. Median nerve assessment showed absent I–III digit SNAP and normal distal motor latencies and amplitudes of thenar compound muscular action potentials (CMAP) bilaterally (Fig. 1). Proximal median and ulnar motor conduction studies were normal bilaterally. Median and ulnar nerves were compared by positioning the active electrode over the palmar second intermetacarpal space to record CMAP from the second lumbral and first interosseous palmaris muscles. Median and ulnar nerve stimulation of the right (asymptomatic) hand elicited normal CMAP. The second lumbral CMAP in the left (symptomatic) hand was absent, whereas the first interosseous palmaris CMAP was normal (Fig. 1). Needle electromyography of the left second lumbral muscle disclosed fibrillation potentials but no abnormality in the right hand or thenar muscles bilaterally. Abnormal median-ulnar forearm communications were excluded. These findings suggested that the left TMB took an anomalous route outside the carpal tunnel and led to a diagnosis of left CTS with “atypical” sparing of the thenar median motor fibers. An open surgical release of the left median nerve at the wrist markedly reduced the paresthesias and pain. Operation disclosed a single TMB leaving the median nerve radially, 3–4 cm proximal to the wrist.

Preoperative findings

Postoperative follow up

Figure 1. Preoperative and postoperative neurophysiologic data. The normal thenar CMAP after median nerve stimulation despite an absent left second lumbral CMAP suggested an anomalous thenar TMB, subsequently confirmed during surgery. Postoperatively, the left second lumbral CMAP appeared. Filters used for acquisition: 10 Hz–10 kHz.
and running over the carpal ligament, without other anatomic anomalies.

Neurophysiologic follow-up 2 months after surgery showed that the left second lumbrical muscle CMAP had appeared, possibly because surgery had reversed the conduction block of the motor fibers running beneath the carpal ligament. Other electrophysiologic measures remained unchanged (Fig. 1).

An anomalous course of the TMB has been described in isolated cases and in surgical and postmortem series. These anomalies can cause either a focal entrapment or a selective sparing of the TMB in the carpal region. They also incur the risk of incomplete decompression or inadvertent nerve lesion during surgery. Anomalies commonly escape detection on standard neurophysiologic investigations. To our knowledge, no reports have described the electrophysiologic correlates of an anomalous TMB. Suspicion of an anomalous TMB first arose when we analyzed the preoperative electrophysiologic data. A detailed electrophysiologic investigation allowed us to interpret these data correctly and thus diagnose CTS. Neurophysiologists should be aware of these anomalies to avoid misdiagnosis and give the surgeon extra preoperative information.

B. Gregori, MD
N. Accornero, MD
G. Canero, MD

1Department of Neurological Sciences, La Sapienza University, Viale Regina Elena 336, 00199 Rome, Italy
2San Feliciano Hospital, Rome, Italy