Case Report

Psychogenic paraplegia in a patient with normal electrophysiologic findings

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Study design: A case report of psychogenic paraplegia following a motor vehicle accident was clinically diagnosed using median (MN) and posterior tibial nerves (PTN) somatosensory evoked potentials (SSEPs).

Objective: To report an unusual case of paraplegia in spite of normal electrophysiological and non-compromising radiographic spine findings.

Summary of background data: Conversion disorder with motor system symptoms or deficit is a subtype which includes symptoms such as impaired motor coordination or balance, paraplegia, muscle weakness, difficulty in swallowing, and urinary retention.

Methods: The SSEPs were performed by each PTN at the ankle region behind the medial malleolus or the MN at the wrist using square wave pulses in 15 mA intensity. The SSEPs revealed well-developed somatosensory peaks for all extremities.

Results: Well-resolved MN-SSEPs were seen with stimulation of either arm. The principal peaks of N20 and P22 were 17 and 21 ms for both upper extremities. The principal peaks of P37 and N45 were 35 and 46 ms for both lower extremities. No side-to-side latency difference was noted. The MRI scan finding was a non-displaced L1 fracture without spinal canal compromise.

Conclusions: In spite of an apparent paraplegia, contradictory clinical findings, normal neurophysiologic tests, and normal neuroradiologic findings are positive criteria for paraplegia/quadriplegia with psychogenic etiology.

Spinal Cord (2001) 39, 664–667

Keywords: median nerve; posterior tibial nerve; psychogenic paraplegia; somatosensory evoked potentials

Introduction

The main feature of conversion disorder is the presence of symptoms or deficits, which affect voluntary motor or sensory function, that suggest a neurological or other general medical condition. The symptoms are not intentionally produced.¹ The conversion symptoms are referred to as 'pseudoneurological'. Motor deficits include impaired coordination or balance, paralysis or localized weakness, and urinary retention. According to the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, the following features are identified as positive criteria for psychogenic paralysis etiology: (1) contradictory clinical findings such as normal muscle tone, normal deep reflexes, or pyramidal signs; (2) paradoxical behavior; (3) normal

electrophysiologic features; and (4) normal radiographic findings.¹ Conversion often follows a traumatic event and may be a psychological mechanism evoked to cope with acute stress.²

Electrophysiological techniques measure brain and spinal cord dysfunction that might otherwise be missed with CT or MRI. They complement imaging techniques by providing a noninvasive measure of the existing physiology. At times, physicians are faced with a situation in which a patient's symptoms are not completely compatible with the description of the original accident or the physical examination.^{3–8} In such cases, somatosensory (SSEPs) or motor evoked potentials (MEPs) are helpful in confirming the psychogenic nature of the neurologic deficit.^{9,10}

The present report describes the utility of SSEPs to rule out an anatomical or electrophysiological cause for paralysis in a patient with conversion disorder.

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Case report

A very thin 37-year-old Asian female was involved in a rollover motor vehicle accident. It was not clear if she was restrained, and the exact details of the accident were unclear. In the field, she was very combative and apparently refused any treatment and was pulling out her intravenous line. She had multiple facial abrasions and lacerations, with a large abrasion and bruise on her forehead. She was noted to be paraplegic with normal rectal tone. She apparently had stable vital signs otherwise. On arrival at the ER department, she complained of some pain in her left thumb and had mild pain in her back. She denied neck pain, shortness of breath, abdominal pain, or other extremity pain. Methylprednisolone spinal cord injury protocol was begun. Sagittal T1 and spin echo T2 weighted images with fat suppression were obtained. Axial gradient echo and axial fast spin echo T2 weighted images were also performed. The MRI of the thoracic spine showed height and alignment of the vertebral bodies were normal. There was no evidence of edema within the vertebral bodies to suggest contusion or fracture. The spinal cord showed normal contour, diameter and signal intensity and there was no evidence of an extradural mass. The MRI of the lumbar spine demonstrated a compression fracture involving the superior end plate of the L1 vertebral body (Figure 1). There was a slight retropulsion of vertebral bone fragments but posterior elements were intact. There was no compromise of the central canal. The L2, L3, L4 and L5 vertebral bodies were normal in appearance. The paraspinal soft tissues were normal in appearance with limited axial images. The patient also had a CT scan of the head, which was within normal limits. A detailed neurological examination demonstrated an alert and oriented patient who was evasive when answering questions. Her upper extremities had normal sensation and motor function. Her lower extremities had no voluntary motor function and no movement to pain. She had no sensation up to the inguinal region bilaterally, above which she had normal sensation and there was no gradation of return of sensation. She had normal reflexes in the upper extremities and 3+ reflexes in the knees bilaterally with some evidence of clonus intermittently at the ankles. There was no specific clonus upon testing, but it did appear intermittently, which was somewhat unusual. She had no motion to plantar stimulation. Her lumbar and thoracic spine were nontender without deformities and she had normal rectal sphincter tone and a normal bulbo-cavernosus reflex.

A psychiatric consultation was sought to evaluate this patient for a possible conversion reaction. Upon her interview, she stated that she intentionally caused the accident as a suicide attempt. She stated that her life was very unhappy and she did not want to live. Apparently, she had made previous suicidal attempts by medication overdose. In her interview, she was quite guarded during the examination and appeared

Figure 1 The MRI of the lumbar spine demonstrated a compression fracture involving the superior end plate of the L1 vertebral body. There was a slight retropulsion of vertebral bone fragments. Posterior elements were intact. There was no compromise of the central canal. The L2, L3, L4 and L5 vertebral bodies were normal in appearance. The paraspinal soft tissues were normal in appearance with limited axial images

quite suspicious of the psychiatrist, asking to see his business card, and, not being entirely satisfied with that, asked to see identification in the form of a driver's licence. Her speech was soft and regular. Her mood was depressed and her affect blunted and very guarded. She reported suicidal ideation, but denied auditory or visual hallucinations, or homicidal ideations. To evaluate spinal cord function in this case, baseline upper extremity (median nerve; MN) and lower extremity (posterior tibial nerve; PTN)

Figure 2 The somatosensory evoked potentials (SSEPs) were recorded by alternately stimulating each posterior tibial nerve (PTN) at the ankle region behind the medial malleolus or the median nerve (MN) at the wrist. Two averages of 120 trials were obtained to stimulation of each nerve. The SSEPs revealed well-developed cortical peaks for all extremities. A well-resolved MN-SSEPs were seen with stimulation of either arm. The principal peaks of N20, and P22 were 17 and 21 ms for both MNs. The principal peaks of P37 and N45 were 35 and 46 ms for both PTNs. No side-to-side latency difference was noted

somatosensory evoked potentials (SSEPs) were ordered.

The SSEPs were performed by alternately stimulating each PTN at the ankle region behind the medial malleolus or the MN at the wrist using biphasic 200 μ s square wave pulses at a rate of 2.82/s and intensity of 15 mA. Two averages of 120 trials were obtained to stimulation of each nerve with a bandpass of 10–2000 Hz. The SSEPs revealed well-developed somatosensory peaks for all extremities. Well-resolved MN-SSEPs were seen with stimulation of either arm. The principal peaks of N20 and P22 were 17 and 12 ms for both MNs. The principal peaks of P37 and N45 were 35 and 46 ms for both PTNs. No side-to-side latency difference was noted (Figure 2). No motor evoked potential (MEP) monitoring, either electrical or magnetic stimulation, was performed on this patient due to the lack of the formal approval from the Investigational Review Board of our hospital at that time.

In lieu of normal electrophysiological findings and lack of any significant anatomical disruption of the

spinal canal and spinal cord impingement, she was transferred to the psychiatric service for treatment of depression and conversion disorder. The patient was discharged 2 weeks later; she was ambulating normally.

Discussion

A diagnosis of conversion disorder should be made only after a thorough medical investigation has been performed to rule out a neurological or general medical conditions¹. Conversion symptoms are often inconsistent. A 'paralyzed' extremity will be moved inadvertently while dressing, or when attention is directed elsewhere. A broad range of neurological conditions may be misdiagnosed as conversion disorder. Prominent among them are multiple sclerosis, myasthenia gravis, and idiopathic or substance-induced dystonias. As many as one-third of individuals with conversion symptoms have a current or prior neurological condition. Individuals with this disorder may show 'la belle indifference' or lack of concern about the nature or implications of their symptoms, however, no specific laboratory abnormalities are associated with this condition. Psychogenic paralysis after minor trauma presents a difficult medicolegal issue. Despite normal films and physical examination, the physician is forced to perform myelography to exclude lesions such as disk herniation, epidural hematoma, or contusion of the spinal cord.⁶ It is the absence of expected findings that suggests and supports the diagnosis of conversion disorder. Symptoms typically do not conform to known anatomical pathways and physiological mechanisms. The expected objective signs such as reflex changes following paralysis are rarely present.

SSEP and MEP recording are simple and non-invasive methods which can objectively evaluate the integrity of central and peripheral sensory and motor pathways.^{9–11} The use of SSEPs has expanded to the evaluation of trauma, stroke, tumors, and metabolic disorders.¹¹ Morota *et al*¹⁰ reported a case of psychogenic quadriplegia diagnosed by MEP monitoring in a 12-year-old girl who underwent surgery for repair of a recurrent syringomyelia. The SSEP test showed no change in comparison to those obtained at the end of her preceding surgery. MEP was normal for the lower extremities, a finding which was inconsistent with a severe upper motor neuron lesion. It would have been helpful to try MEP monitoring in our patient, however, we did not have proper approval from our IRB Committee to carry out this test.

In conclusion, normal SSEPs or MEPs in a patient denying sensation of the stimulus offer objective evidence of the psychogenic nature of the para/tetraplegia and are a valuable tool in this clinical setting. The rehabilitation of patients with conversion paraplegia should include physical therapy and reassurance. Psychiatric consultation is important to define underlying psychopathology.

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