

## ***Conversion Disorder: Tetraplegia after spinal anesthesia***

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### **ABSTRACT**

#### **Conversion Disorder: Tetraplegia after spinal anesthesia**

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This case report describes the rare occurrence of tetraplegia, caused by conversion disorder, in a patient who received spinal anesthesia for arthroscopic surgery. A 35-year-old female with a history of migraine headaches received spinal anesthesia for arthroscopic left knee surgery. On sensory block examination, she was noted to have a T10 level of blockade. During surgery and 45 min after performing spinal anesthesia, patient reported bilateral loss of both sensation and motor function of her upper limbs. Patient was hemodynamic stable with absence of respiratory depression or any alteration of consciousness level. Physical signs and symptoms did not correlate with any known anatomical or neurological patterns. MRI imaging revealed no abnormalities. Psychiatric consultation was performed where in familial stressor circumstances were identified, leading to diagnosis of conversion disorder.

### **INTRODUCTION**

Conversion disorder (functional neurologic symptom disorder) is characterized by neurologic symptoms such as weakness, paralysis, trouble with swallowing, unusual speech, numbness, unusual sensory problems, nonepileptic seizure or a mixture of symptoms. The patterns of symptoms are inconsistent with

a neurologic disease, but nevertheless are genuine, cause distress and/or psychosocial impairment. The symptoms are not factitious or made up by the patient. Conversion disorder (CD) can occur in both adults and children<sup>1</sup>. Some patients experience an acute version of conversion disorder that lasts only a few days or less. For others symptoms can persist for weeks or months. Conversion disorder is most common after a stressful life event or period of

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stress and is two to three times more common in women than men. The CD is common in clinical settings<sup>1</sup>. Perioperative appearance of conversion symptoms mimicking medical disturbances, drug effects, or anesthetic or surgically related complications require excessive investigation to exclude organic causes. Conversion disorder should be considered in cases with unexplainable physical symptoms after all other possible causes have been eliminated and psychiatrists should be consulted to confirm the diagnosis.

### CASE PRESENTATION

A 35-year-old, female patient was scheduled for elective arthroscopic surgery on her left knee for partial meniscectomy. From preoperatively evaluation patient reported only migraine headaches. She took no regular medication at the time of surgery. She also had a history of upper limb periodic numbness; however magnetic resonance imaging (MRI) of her cervical spine was normal. The patient also had undergone a caesarian section under general anesthesia eight years previously with no anesthetic complications. Preoperative laboratory results were all within normal limits.

After the arrival of the patient in the operating theater, standard monitoring was applied and a peripheral venous 16G catheter was inserted for hydration with Ringer's Lactate. Baseline hemodynamic values were recorded. Patient was

premedicated with 2mg midazolam and spinal anesthesia performed in the right lateral decubitus position, with a 25 gauge Quincke needle at the L3–4 interspace, using the midline approach. After establishing flow of clear cerebrospinal fluid, 3.0 mL of 0.5% levobupivacaine plus 20µg fentanyl were injected into the subarachnoid space. Satisfactory motor and sensory block (level T10) was achieved. Surgery commenced with no apparent immediate complications or major hemodynamic changes. During surgery and 45 min after spinal anesthesia, the patient complained of complete paralysis of both upper extremities and complete loss of sensation from the C4 dermatome downwards and also no response to pain stimuli was noted. Initially, it appeared to be the development of a high spinal block, therefore preparation was made for endotracheal intubation. An additional three peripheral venous catheters of 18G were placed, invasive blood pressure monitoring was established and a urinary catheter was inserted. However, despite the loss of sensation of her upper extremities, chest, and abdomen with a sensory level of C4 dermatome, vital signs remained stable, conscious level was normal and there were no signs of respiratory failure (Rate, depth of respirations, and oxygen saturation were normal and ABG analysis within normal limits). Surgery was successfully completed and the patient transferred to the post anesthesia recovery room. She

remained haemodynamically stable and was alert and oriented.

A brain and total spine MRI scan examination was carried out immediately after surgery, which failed to show any pathological findings. Post-operative neurological examination was performed by a consultant neurologist four hours after spinal anesthesia and revealed a loss of sensation affecting both upper and lower limbs, abdomen and chest, with a sensory level at the C4 dermatome and absence of motor function in all four limbs. Tendon reflexes of her upper limbs were normal and equally elicited, but tendon reflexes of lower extremities were difficult to elicit. The plantar responses were normal bilateral. With lifting of the arms into the air and subsequent release, the patient was unable to tonically hold both arms suspended over the bed. Eight hours postoperatively her clinical situation remained unchanged. Therefore after neurologist consultation a second brain and whole spine MRI scan was performed; which was also normal. Her blood cell count, electrolytes, lactate were within normal limits. Considering the MRI findings further cerebrospinal fluid analysis was ruled out. Ten hours postoperatively, the patient was transferred to a ward in the orthopedic clinic. Subsequently, sensory examination began to vary by examiner. Four hours after her transfer she began to move the toes of her right feet and com-

plained of neck and back pain. Progressively on the first postoperative day, patient demonstrated improvement in strength, spontaneous movements of her extremities and had only slight hypoesthesia from C4 dermatome downwards. Upon confirmation of negative MRI imaging and in the absence of any apparent organic explanation for the patient's neurological symptoms, psychiatric consultation was obtained. Interview of the patient revealed the presence of significant familial and social stressors in her life, leading to a presumptive diagnosis of conversion disorder. On the third postoperative day she was fully improved and able to walk around the room. The patient was discharged home two days later with no ongoing neurological deficits.

## DISCUSSION

Conversion disorder is included, in a newly defined category, in the fifth edition of the American Psychiatric Association's (APA), Diagnostic and Statistical Manual of Mental Disorders (DSM-5), called Somatic Symptom and Related Disorders<sup>1</sup>. It involves symptoms or deficits affecting voluntary motor or sensory function that suggest a neurologic or other general medical condition. Conversion disorder is a type of somatoform disorder, where physical symptoms or signs are present that cannot be explained by a medical condition. Diagnostic criteria for conversion disorder as

per the DSM-5 are<sup>1</sup>: 1) One or more symptoms of altered voluntary motor or sensory function 2) Physical findings provide evidence of incompatibility between the symptom and recognized neurological or medical conditions 3) The symptom or deficit is not better explained by another medical or mental disorder 4) The symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.

Patients with conversion disorder may present with hemiparesis, paraparesis, monoparesis, alteration of consciousness, visual loss, seizure like activity, pseudocoma, abnormal gait disturbance, aphonia or dysphonia, lack of coordination, or a bizarre movement disorder. Patients are not intentionally simulating symptoms but are genuinely experiencing them. The less the patient's medical knowledge, the more he/she appears with inexplicable and irregular symptoms. In contrast, symptoms of educated patients are very similar to genuine one<sup>2</sup>. The diagnosis is frequently clinical, based on history and physical examination<sup>2-4</sup>.

Supporting indicators in the patient's history include: previous functional disorders, role models among family member or friends, previous psychiatric background and self-discharge from hospital. Other details in the patient's history compliant to a diagnosis of CD include mental retardation, concurrent

psychiatric disease, physical or psychological trauma in childhood or close to the presentation of CD, and family history of physical disability<sup>2,4</sup>.

The signs leading towards a non-organic diagnosis include inconsistent findings, no adjustment between physical and functional findings, and inconsistency between the symptoms and anatomical or physiological systems. CD will rarely lead to physical changes or disability, so pressure sores, contractures or muscle atrophy are rare<sup>5</sup>. In order to reach a correct diagnosis a thorough neurological examination is essential. Prominent suspicious symptoms include: normal muscle tone, normal reflexes and negative Babinski signs. The weakness does not follow anatomic patterns and is not consistent on repeated examinations. With pseudohemiparesis, the face, tongue, platysma and sternocleidomastoid muscles are usually not affected. Patients with pseudoparalysis have equal weakness of both agonist and antagonist muscles, whereas true paresis affects the extensor muscles more than the flexors. If a 'paralyzed' arm is raised above the subject's head and released, it will not fall directly on his head, but to the side<sup>6</sup>. The sensory examination might reveal changes not related to anatomical dermatomes, inconsistency in repeated examinations, misleading proprioception. Conversion anesthesia in a hand or foot will have a shape of a glove or sock, affecting all

types of sensation, with no determinant level, and with a sharp border, and not according to dermatomal levels<sup>5-7</sup>. Autonomic system is usually unaffected with full sphincter control and normal bowel movement. No spinal shock or other typical dysautonomia signs are presented in conversion tetraplegia<sup>7</sup>.

There are no pathological findings in laboratory tests, supporting CD. Additional tests, imaging (X-ray, CT, MRI) and electrophysiological studies (electroencephalography, sensory and motor evoked potentials) are usually normal. When a subject is admitted with paraplegia, normal reflexes and full control of sphincters, a routine X-ray is sufficient, and the diagnosis is clinical. CT and MRI are unnecessary, and are performed just as additional supporting evidence for the clinical diagnosis<sup>4,8</sup>.

There are few reports in literature concerning conversion disorder after neuraxial techniques (4 spinal, 2 epidurals)<sup>9-14</sup>. In this case report, our patient experienced profound motor and sensory deficits during the surgery, under uneventful spinal anesthesia and operative procedure. Despite the high dermatomal level, the patient's hemodynamic and respiratory status was stable. Our patient continued to have upper and lower extremity weakness with both a motor and sensory component, which was unusual considering that was more than 8h since the spinal anesthesia was performed. Clinical neurological examination did not corroborate

with the patient's subjective symptoms of sensory and motor deficit in the upper and lower extremities. Her sensory deficit was not consistent on repeated examinations. A provisional diagnosis of a conversion disorder was made. This was further confirmed with a clean imaging study of head and spine and no pathological findings in laboratory tests. Consultation with a psychiatrist revealed that the patient had emotional and familial issues to deal with. After reassurance that a full recovery would occur, the patient gradually improved and was discharged from hospital.

## CONCLUSION

Perioperative appearance of conversion symptoms mimics medical disturbances, drug effects, anesthetic or surgically related complications. Psychiatric disorder may be a rare cause of neurologic deficit, after successful regional anesthesia and should be made part of a complete workup.

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### **Author Disclosures:**

Authors Tsetsou A, Karageorgou E, Kontostathis N, Karadimos A, have no conflicts of interest or financial ties to disclose.

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