Case 1

Chief Complaint

This 57-year-old, right-handed woman is presenting with a marked weakness of her right eyelid and double vision when her eye is forced open.

History of Chief Complaint

She had experienced two episodes of blurred vision and headache on the day prior to admission. That evening she went to bed early. She awoke with an inability to open the right eyelid. When she held the eyelid open with her finger, she noted marked double vision. Upon arising from the bed she noted difficulty walking.

Medical History

This patient had had moderate hypertension for 30 years. The hypertension was managed using beta-blockers. Five years previous she had experienced several episodes of transient right-hand weakness and paresthesia and dysartheria. Two year prior, she experienced an episode which involved right-hand weakness and paresthesia and dysartheria and lasted for 15 minutes. This episode was accompanied by blurring of vision. Examination at that time revealed slightly elevated deep tendon reflexes on the right side.

Physical Examination

She was awake, oriented, and of anxious demeanor. The patient was well nourished, well hydrated, obese, and in poor physical condition; she appeared slightly older than her stated age. Optic discs had sharp edges. Her chest was clear to auscultation and percussion. Her blood pressure was 160/100; pulse, temperature, and respirations were physiologic. Abdomen was difficult to palpate because of her obesity; however, no tenderness was observed. Peripheral pulses were difficult to access; mild edema was present at the ankles but not at the wrists.

Neurologic Examination

Mental Status. The patient was alert and oriented to time and place. Speech was articulate and speech content was meaningful. Memory and knowledge were appropriate for her background. She could follow two- and three-step commands and was an adequate historian.

Cranial Nerves. Visual fields were full to confrontation. If asked to open her eyes, the right eyelid did not elevate beyond 2 mm; the left opened 10 to 12 mm. When the right eyelid was elevated by external force, the right eye was deviated to the right and down; she could effect no medial or upward movement of the right eye. The right eye did not respond to caloric testing, nor did it respond during attempted convergence. A full range of motion was present with the left eye. Pupillary responses were intact bilaterally. Although it did not move, the right eye would dilate with the left eye on attempted convergence. Hearing was normal in both ears. A minor weakness was noted in the left corner of her mouth when she attempted to grimace. Her palate elevated symmetrically, and corneal, jaw-jerk, and gag reflexes were intact. Her tongue protruded on the midline and her shoulder shrug was symmetric and of physiologic strength.

Motor Exam. Strength was intact in all limbs. Deep tendon reflexes were physiologic and symmetric in both lower extremities and the right upper extremity; the left upper extremity had 3/4 reflexes at the elbow and wrist. The abdominal reflex was absent on the left.

Sensory Exam. Pinprick, two-point discrimination, vibratory sense, and proprioception were present throughout face and body bilaterally

Discuss this case in term of CNS location and causes of these manifestation

Case 2

Chief Complaint

A 79-year-old, right-handed retired business, executive was brought to his general practitioner's office by his son after suffering a momentary loss of consciousness followed by the development of double vision and a tremor in his left arm.

History of Chief Complaint

He complained of frequent dizzy periods over the last 5 days. The dizzy episodes were occasionally accompanied with diplopia. On the morning of admission, he had experienced a brief period of syncope upon arising from bed. After regaining consciousness he complained of a pronounced and persistent double vision.

Past Medical History

His past medical history was positive for rheumatic fever at age 6. For the past 5 months he had been experiencing periods of dizziness and fatigue. He had a 30-pack-year history of smoking, but quit completely 3 years before. He drank 2 to 3 ounces of alcohol socially per week.

General Physical Examination

He was alert and oriented. The patient frequently had to cover his right eye with his hand in order to move about the room. Optic discs were clear with sharp borders. External auditory canals were patent. His neck was supple; there where no bruits over the carotid artery. His larynx and pharynx were non-reddened. Heart rate was irregularly irregular. Peripheral pulses were intact; a pulse deficit was present, with the auscultated apical rate exceeding the radial pulse rate. Blood pressure was 135/93, temperature was 37°C, and respirations were 16/min.

Neurologic Examination

Mental Status: The patient was alert and oriented to time and place with memory and knowledge appropriate for his age. He was articulate in speech and had good comprehension of spoken and written language. He gave a comprehensive history.

Cranial Nerves: On forward gaze, with the lid forcibly elevated, the right eye had an external strabismus; on attempted left lateral gaze, the right eye drifted toward the midline. The right pupil was larger than the left. The right pupil was unresponsive to light shined in either eye; the left pupil was responsive to direct and consensual light. The right eyelid elevated 4 mm, whereas the left elevated 13 mm on forward gaze. With the right eyelid forcibly elevated, its visual field was full to confrontation. The visual field in the left eye was also full. The patient noted diplopia on attempted vision into all fields of gaze. The diplopia was absent with the right eye covered and exacerbated when the right eyelid was fully elevated. Hearing was normal in both ears. He had a full range of facial expressions. Jaw-jerk and corneal reflexes were normal; the palate was elevated on the midline; gag reflex was normal; and tongue protruded on the midline.

Motor Exam: Strength was normal in all limbs; deep tendon reflexes were +2/5 on the right and +3/5 on the left. No Babinski response was present. A tremor of intent was present in the left arm. Finger-to-nose testing was normal on the right, but he was slightly off target when using the left upper limb. The left arm and hand displayed an occasional jerky movement that the patient could not suppress.

Sensory Exam: Pinprick and temperature sensation were normal throughout body and face; position sense and vibratory sensation on the left side of his body was diminished. This sensory loss was more noticeable in the upper than in the lower extremity.

Discuss this case in term of CNS location and causes of these manifestation

Case 3

Chief Complaint

This 55-year-old man experienced a sudden onset of numbness in his left upper limb while eating supper. When it persisted, he consulted his family physician.

History of Chief Complaint

At the time of examination he was unmarried and worked in a factory performing quality-control inspections. Both of his parents were alive, and he had lived with them all his life. He was diagnosed with myotonic dystrophy at 33 years of age; its course had been a slow, progressive increase in proximal muscle weakness since that time.

General Physical Examination

The patient was an awake, alert, oriented man with significant muscle wasting, especially in the proximal limb muscles. His movements were punctuated by occasional tonic muscle contractions of considerable force. He appeared older than his stated age. The center of the lens in each eye was significantly, grayed obscuring observation of the optic discs. His blood pressure, respiration, and temperature were all within normal ranges. His chest was clear to auscultation; the abdomen was soft, with no tenderness. A reducible mass was present in the inguinal region on the right. The cataracts, myotonia, and proximal muscle weakness are of long duration.

Neurologic Examination

Mental Status: He was awake and oriented for time and place. Normal mental status was found on all tests except for a short-term visual memory deficit discovered during a neuropsychological examination at a latter date; there was no significant amnesia or aphasia.

Cranial Nerves: Visual fields were full to confrontation, however, visual acuity was poor. A full range of eye movements was possible, and no nystagmus was present. Facial expression was full, and smiling was symmetric. His hearing was normal in both ears. Jaw-jerk and corneal reflexes were physiologic. The palate was elevated midline, and tongue protruded midline. Shoulder shrug was bilaterally symmetric. Swallowing and voice were normal.

Motor Systems: Extended periods of tonic muscle contractions followed some of his movements; these lessened with repetitive motion. Muscle strength was diminished, with considerable wasting present in the proximal muscles of the shoulders and pelvis. His tendon reflexes were diminished but symmetric in all extremities, and plantar reflexes were flexor. His left-hand exhibited athetoid movements but only when he closed his eyes.

Sensory Exam: He had loss of sensation on the left side of his torso and face and left extremities for pinprick, light touch, proprioception, vibration, two-point discrimination, graphesthesia, and stereognosis. There was an abrupt vertical boundary to the sensory loss along the midline of the torso. No hyperesthesia or dysesthesia was noted.

Discuss this case in term of CNS location and causes of these manifestation

Case 4

Chief Complaint

This was a 54-year-old, right-handed female with a paralysis and subsequent uncontrolled movement.

History of Chief Complaint

The patient is a housewife who developed hemiparesis and hemiparesthesia of rapid onset in the right arm and leg 9 months earlier. Subsequently, the paresis and sensory deficit resolved over a 3-month interval; however, an involuntary, flinging motion of the right arm and a writhing, jerky motion of the right leg slowly developed during this time. She is in considerable distress, since the involuntary motions of her extremity disrupted her gait and postural station and thus incapacitated her in her daily routines. She admitted to severe social embarrassment because of the involuntary motion.

Medical History

Nine months previously, she had suffered a cerebrovascular event that left her with hemiparesis and hemibody sensory loss on the right side. Language and cognition were not noticeably affected in this event.

General Physical Examination

The patient was an alert. Signs of exhaustion and distress were evident, and she was of anxious demeanor. Her optic discs were clear and had sharp borders; visual acuity was normal. Her neck was supple, with no bruits. Her blood pressure, heart rate, and respirations were slightly elevated. Her chest was clear to percussion, and the abdomen was soft, with no masses or tenderness. The remainder of the examination was precluded because of the excessive involuntary limb motion.

Neurologic Examination

Mental Status: This is an alert, oriented, and cooperative female in considerable emotional distress. Language, comprehension, reading, and memory were appropriate.

Cranial Nerve: Testing was complicated by the violence of her involuntary motion in the upper extremity. She had a full range of eye movements, pupils were equal and reactive to light, and accommodation was intact. The corneal and gag reflexes were intact; jaw-jerk was normotensive. Her hearing was equal in both ears. Her tongue protruded on the midline.

Motor Systems: Muscle strength and reflexes were normal in both extremities on the left but were difficult to test definitively on the right because of the continuous and violent involuntary motion. The movement in the upper extremity consisted of violent flinging motions superimposed on a continuous writhing jerky movement. The lower extremity demonstrated the continuous writhing motion with only brief jerks. Occasionally, the jerky motion in the lower extremity became violent. Attempts to reduce the motion in either extremity by physical restraint were unsuccessful. She could move the right extremities on command in between the involuntary motions. Gait was severely compromised by the flinging of the upper extremity. Although she did not experience an embarrassment of postural reflexes, the upper-extremity motion was continually pulling her off station. The involuntary movement of the right extremities was ameliorated with sleep but returned upon waking.

Sensory Exam: Vibratory sensation and pinprick were intact on the left; to the extent that it could be tested, both modalities were equivocal on the right.

Discuss this case in term of CNS location and causes of these manifestation

Case 5

Chief Complaint

This was a 75-year-old, right-handed male with tonic posturing motions of the left upper extremity.

History of Chief Complaint

The patient suffered a cerebrovascular event two years previously. This event left him with a transient spastic paralysis of the left upper and lower extremities. The posturing movements developed subsequent to a resolution of the spastic paralysis. He is now presenting for an annual checkup, 2 years following a cerebrovascular event.

Medical History

He had been in good health until 2 years before, when he suffered a cerebrovascular accident of rapid onset that left him with spastic paralysis and sensory paresthesia in the left extremities. At that time his strength in the left limbs was 2/5 and his. deep tendon reflexes were elevated at +4/4. No language or cognitive deficit was recorded at the time of the first presentation.

Neurologic Examination

Mental Status: He was alert, oriented for time and place, and cooperative. He gave precise history. Memory was appropriate; speech, writing, and reading (English, Polish, and Hebrew) were intact. He could list all the presidents in order and recite passages from the Torah verbatim.

Cranial Nerves: He had a full range of eye movements, and visual fields were intact. His hearing was significantly diminished, especially for the high frequencies, more so in the right ear than in the left. The corneal and jaw-jerk reflexes were intact; facial expression was symmetric and appropriate to the situation. The gag reflex was intact; palate, uvula, and tongue were symmetric in position. He had slightly diminished sensation to vibratory sense on the left side of his face.

Motor Systems: Strength was 5/5, and deep tendon reflexes were +2/4 for both extremities on the right. Strength was mildly reduced (4/5) for the upper limb on the left, and deep tendon reflexes were slightly elevated (+3/4). The lower limb on the left had reduced strength (3/5) and increased deep tendon reflexes (+3/4). An involuntary, posturing movement was present in the left limbs that had not been detected in his first presentation, poststroke. In the upper limb, the movement consisted of slow, writhing postural changes, including pronounced flexion of the wrist, and phatangeal-metacarpal joints. With the upper limbs held horizontally extended, the left limb wandered in position continuously. Occasional, sudden jerky movements of the upper limb occurred. The lower left limb displayed r, low postural movements that interfered with his gait. The movement disorder was somewhat masked by the more pronounced residual paralysis in the lower left limb. The involuntary motion ceased when the patient slept, returning when he awoke. Past-pointing and dysmetrla were not present on either side. Pronator drift did not appear to he present, but this was difficult to evaluate on the left side because of the wandering motion in the upper limb. With the upper limbs extended anteriorly and held in a fixed position, a 10-Hz tremor was present in the right arm, but not in the left. This movement in the right limb was ameliorated when the arm was relaxed to the adducted portion. The tremor could be seen in his writing, particularly if he held his hand off of the paper's surface as he wrote.

Sensory Exam: Response to pinprick, vibratory stimuli, and position sense was normal on the right side of his body and only slightly reduced on the left side.

Discuss this case in term of CNS location and causes of these manifestation

Case 6

A 25 year old man who was trimming branches from tall trees in front of his house, fell off his ladder and was found unconscious on the ground. He was rushed to the emergency room and he was subsequently admitted to the hospital. After 24 hours, he regained consciousness. On examination he was alert and answered questions normally. However, you found the following signs:
1. Tactile and vibratory sensation was absent over the entire left lower body and lower limb. He could not tell the orientation of his left leg when you moved it into different positions.
2. Tactile sensation was normal on the entire right side of his body. He correctly indicated the position of his right leg when it was moved.
3. Pin prick sensation was absent on the right side of the lower body and leg from the level of the umbilicus down.
4. Pin prick sensation was normal on the entire left side of the body.

Discuss this case in term of CNS location and causes of these manifestation

Case 7

A 30 year old man noticed a weakness in his right hand which was progressing and causing him enough problems to seek medical attention. On examination he demonstrated bilateral weakness, atrophy and fasciculations of the intrinsic muscles of his hands and shoulders. Upper motor neuron syndrome signs, i.e., weakness, hypertonia, hyperreflexia, positive Babinski were noted in both lower extremities. Dermatomes C-2 through T-6 demonstrated bilateral loss of pain and temperature sensation. There was bilateral impairment of position and vibratory sense below hips.

Discuss this case in term of CNS location and causes of these manifestation

Case 8

Admitted to the hospital complaining of chest pain, a 50 year old man also complained of problems with vision which were getting progressively worse. He described drinking copious amounts of water each day for many years. This was accompanied by polyuria and nocturia. Upon questioning he revealed that he never had a significant sex drive. He weighed 252 pounds and was 5 feet 6 inches tall. He was alert with good memory and had appropriate, well articulated speech. Motor and sensory functions and cranial nerve examination were normal except for vision that showed a bitemporal hemianopsia. His temperature fluctuated between 37.3°C and 37.9°C daily.

Discuss this case in term of CNS location and causes of these manifestation

Case 9

A 50 year old woman had a sudden onset of dizziness and vomiting. Her family noticed that her left eyelid drooped. After she was taken to see a doctor, the neurologic exam demonstrated loss of pain and temperature sensation from her right side of the body and numbness on the left side of her face. Though vibratory sensation and proprioception were normal bilaterally, she still had ataxic gait with falling toward the left side. There was no indication of spastic paralysis or Babinski signs. She had a horseness to her speech and she had a diminished gag reflex.

Discuss this case in term of CNS location and causes of these manifestation