Case 1

A 40-year-old man presents to the psychiatry emergency room for inappropriate behavior and confusion. He works as a janitor and has had reasonably good work attendance. His coworkers say that he has appeared “fidgety” for several years. They specifically mention jerky movements that seem to affect his entire body more recently. His mother is alive and well, although his father died at age 28 in an auto accident. On examination, he is alert but easily distracted. His speech is fluent without paraphasias but is noted to be tangential. He has trouble with spelling the word “world” backwards and serial seven’s, but recalls three objects at 3 minutes. His constructions are good. When he walks, there is a lot of distal hand movement, and his balance is precarious, although he can stand with both feet together. His reflexes are increased bilaterally, and there is bilateral ankle clonus. A urine drug screen is negative.

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

Case 2

A 65-year-old woman was referred for problems with abnormal involuntary movements of the mouth and face. She has had good health until 3 years ago when she developed problems with nausea and constipation. She was placed on metoclopramide with some relief of symptoms. A complete gastrointestinal (GI) workup was negative, although it was hypothesized she had decreased gastric motility. These abnormal movements began approximately 1 year ago. They have been getting progressively worse. The movements do not interfere with speech but do interfere with eating. She also occasionally has arching spasms of the back and neck. Her examination is remarkable for stereotypical repetitive movements of the tongue and jaw and the sustained arching.

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

Case 3

A 68-year-old woman was brought to the emergency room after suddenly developing speech difficulty and weakness of the right arm and leg. She was in her usual state of health when she was observed by family members to become mute and slump in her chair. Her past medical history is significant for hypertension and angina for which she takes a beta-blocker, atenolol, and a calcium channel blocker, amlodipine. The patient's temperature is 36.6°C (98°F); heart rate, 84 beats/min; and blood pressure, 172/86 mmHg. Her physical examination reveals no carotid bruit and an irregularly irregular cardiac rhythm. Neurologic examination shows an alert, attentive patient who is able to follow some simple commands but has severe impairment of word fluency, naming, and repetition. There is a left gaze deviation and right lower facial droop. There is severe weakness of the right upper extremity and, to a lesser degree, weakness of the right lower extremity. The left limbs display full antigravity power without drift for 5 seconds.

Assume a lesion at a single location in the nervous system caused the above symptoms. What is the most likely the position and level of this lesion (if possible show a cross-sectional diagram picture) showing a damaged area of the nervous system that would produce these symptoms. Mention the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged.

Case 4

A 36-year-old man is referred for evaluation by his family physician. He is presenting with a progressing weakness and sensory loss in the upper and lower extremities and with the recent onset of dyspnea.

History of the Chief Complaint

He first noticed the weakness and loss of sensation to temperature in the upper extremities 12 months previously; the onset of weakness in the lower extremities has occurred in the past 4 months. He has noticed the onset of shortness of breath in the last month.

Medical History

He has enjoyed good health until 18 months ago when he suffered a road traffic accident. While stopped at an intersection he was struck from behind and received a whiplash injury. He wore a cervical collar for two months following the accident and still experiences neck pain and paraspinal muscle spasms for which he is taking medication. He has no history of blood transfusions, denies IV drug abuse, and has not been out of the country except for an occasional trip to Canada. He denies any recent history of noticeable viral or bacterial infections. He denies any history of respiratory tract illnesses.

Medications

Voltarin to relieve the neck pain and Flexeril for the paraspinal muscle spasms.

Social History

He is a faculty member at a small liberal arts college, has never married, and lives alone. He does not smoke or consume alcohol and denies any sexual activity

Family History

His mother and father are still alive and in good health, he has no siblings.

General Physical Examination

This is an awake, oriented male, appearing older than his stated age and with noticeable muscle wasting in the upper extremities. His heart rate is 90, blood pressure is 127/85, temperature is 98.7^{o}F, and respirations are 19. During respiratory movements his sternum moves anteriorly, but little lateral motion occurs along the subcostal margins. On inhalation, his sternocleidomastoid muscle becomes prominent. Respiratory movements are rapid but of short duration. His skin is moist and supple. His chest is clear to auscultation and abdomen was soft to palpation with no tenderness. No lymphadenopathy is detected in the axilla or groin area.

Neurologic Examination

Mental Status. He is awake, oriented for person, place and time, and has an appropriate memory and knowledge base. Speech is clear and meaningful. He can follow three and four-step commands, but is hampered by his weakness.

Cranial Nerves. A full range of eye movements is present; visual acuity was 30/20 in the right eye and 40/20 in the left eve without glasses. Pupillary reflexes are present to direct and consensual light. Hearing is intact to finger rub at both ears. Gag and corneal reflexes are intact and facial movements are full. The uvula is symmetric and the tongue protruded on the midline.

Motor Systems. Strength in the upper right extremity is 4/5 at the deltoid, 3/5 at the triceps, 3/5 at the biceps, 2/5 and at the brachioradialis; grip strength is 3/5. In the left upper extremity strength is 4/5 at the deltoid, 3/5 at the triceps, 2/5 at the biceps, 2/5 and at the brachioradialis; grip strength is 4/5. The lower extremity strength exam finds the quadracepts at 3/5, the gastrocs at 3+/5 and anterior tibialis at 4/5 on the right. On the left, the quadraceps is 2/5, the gastrocs is 3/5 and anterior tibialis is 4/5. Both upper extremities have diminished deep tendon reflexes at the elbow, and wrist, muscular fasciculations, and atrophy is present bilaterally. Both lower extremities had elevated deep tendon reflexes and the plantar reflex is extensor bilaterally.

Sensory Exam. He lacked sensation to temperature and pinprick in a cape-like distribution over the chest and shoulders extending throughout the upper extremities to the fingertips. Vibratory sense, discriminative touch, and proprioception were intact throughout his chest and upper extremities. Normal sensation was found elsewhere over the body.

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

Case 5

An 82-year-old, right-handed man with a long history of illness, was brought to the emergency room by his family; he was in acute distress with back pain and unable to walk.

History of Complaint

Patient experienced severe back pain radiating into both legs that remitted promptly when lying down. The next day he experienced similar transient pain in the back and the legs. Later that day, while experiencing an episode of severe back pain, his legs became paralyzed and he was rushed to the hospital.

Medical History

The patient had a previous history of transurethral prostatectomy and bilateral orchiectomv for carcinoma of the prostate, left hemicolectomv for adenocarcinoma of the rectum, and arteriosclerotic heart disease and congestive heart failure.

General Physical Examination

He was awake, cooperative, and afebrile and appeared older than his stated age. Funduscopic examination revealed bilateral ocular opacities obscuring visualization of the fundi. External auditory canals were patent. No cervical lymphadenopathy was detected. Blood pressure was 160/90 mmHg, pulse rate was 48 beats per minute with occasional premature beats. There was a grade 2 blowing apical systolic murmur. Bilateral basilar crackles were present in the lungs on inspiration and bilateral jugular venous distention was demonstrable in the neck. Peripheral pulses were intact and equal at the wrists and ankles. Pitting pretibial edema was present. A colastomy stoma was present in the lower left quadrant of the abdomen. Otherwise the abdomen was soft to palpation with normal bowel sounds and no aortic bruits.

Neurologic Examination

Mental Status. He was alert and oriented to person, place and time; memory and affect were appropriate for his age. Speech was clear and meaningful. He was a good historian.

Cranial Nerves. His visual fields were intact and eve movements were full; hearing, to finger rub, was diminished bilaterally. His pupillary, corneal, and gag reflexes were intact: facial expressions were appropriate; uvula elevated symmetrically and tongue protruded on the midline. When asked, he could elevate his shoulders symmetrically with appropriate strength.

Motor Systems. His strength and muscle tone were absent in both lower extremities and deep tendon reflexes were absent at the knee and ankle. His strength and reflexes in the upper extremities were appropriate for his age. His urinary bladder was neurogenic, however, this had been present since his last surgery.

Sensory Exam. There was a well-defined sensory level at T10, below which he had lost sensation to pinprick and temperature. Touch, vibratory, and position sense were intact throughout his body and face.

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

Case 6

A 59-year-old man with headaches, double vision, dizziness, and ataxia

Chief Complaint

A 59-year-old, right-handed male was admitted to the hospital with a chief complaint of occipital headaches of 4 days duration.

History of Chief Complaint

Three days prior to admission, the patient noted a sudden onset of diplopia on forward gaze and a sensation of dizziness. These complaints resolved within twenty-four hours. He experienced several episodes of dizziness and diplopia over the next 24 hours. One day prior to admission he noted a relatively sudden onset of dizziness, diploia and clumsiness in the right hand. These complaints have persisted since that time.

Medical History

The patient had been under treatment for hypertension for 6 years duration with blood pressures in the range of 180/110.

General Physical Examination

The patient was alert, oriented, and cooperative; he was a well-nourished man of medium height who appeared his stated age. Funduscopic examination revealed clear optic disc with sharp borders. The external auditory canal was patent and uninflamed. Pharynx and larynx were non-reddened. A grade II/W bruit was present over the right carotid artery. His blood pressure was elevated (192/96). Peripheral pulses were intact at the ankle and wrist. Respirations were normal. His chest was clear to auscultation: skin was warm and of normal texture; abdomen was soft with no tenderness, lumps, or masses. No edema was present in the extremities; no lymphadenopathy was present in the cervical or inguinal areas.

Neurologic Examination

Mental Status. The patient was awake and oriented with respect to person, place, and time. Memory was appropriate for his age. Speech was articulate and meaningful and he could follow three and four-step commands.

Cranial Nerves. Extraocular movements were full, but tine patient complained of diplopia made worse by lateral gaze to the left. Nystagmus was present on left lateral gaze. The right pupil measured 3 mm, the left was 5 mm, but both responded to light and accommodation. Ptosis of the right eyelid and decreased sweating on the right side of the face (anhidrosis) were also present. Hearing was diminished in both ears to high frequencies. He admits to a feel of dizziness that he describes as the world moving around him. Pain, but not touch sensation, was decreased on the right side of the face with the exception of some sparing around the lips and nasal region. The right corneal reflex was diminished. Facial expressions were full and symmetric. The uvula deviated to tile left, and there was deficient elevation of the right side of the palate. There was also a suggestion of hoarseness.

Motor System. Strength was intact throughout the body; deep tendon reflexes were intact and symmetric. An ataxia was evident in the right upper extremity on finger-tapping, hand-

patting, and finger-to-nose tests. A side-to-side intention tremor was present. Ataxia was also present in the right lower extremity, on heel-to-shin and tibia-tapping tests.

Sensory Exam: He had a mild analgesia to pinprick on the left side of the body, the left "'arm, and the left leg. Position, vibration, and touch modalities were intact throughout the entire body

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

Case 7

Chief Complaint

This was a 43-year-old, right-handed man with a chief complaint of headaches, slurred speech, and right arm and leg weakness.

History of Chief Complaint

The headaches began 2 weeks ago, and 1 weeks ago he noticed the onset of limb weakness and slurred speech. These symptoms resolved in 12 hours and reoccurred several times in the next 48 hours. Five days ago the neurologic symptoms reappeared rapidly. Currently, the headaches have abated, but the weakness and dysarthria remain.

Medical History

The patient was an accountant in a large business firm and regularly worked 60 to 70 hours per week. He was being treated for hypertension, but admitted to recently decreasing his medications without the consent of his physician. He had a 30-pack-year history of smoking and consumed several ounces of alcohol daily. He denied the use of alcohol during the past 24 hours.

General Physical Examination

This was a well-nourished, alert, oriented man who appeared his stated age. He could comprehend spoken and written language, but had dysarthria. His speech was thickened, as if his tongue was swollen. Heart sounds were normal, blood pressure was high (150'99). Pulse rate and respirations were normal and chest was clear to auscultation and percussion. Abdomen was soft with no lumps, masses, or tenderness.

Neurologic Examination

Mental Status. He was alert and oriented with respect to person, time and place. His speech was dysarthric; however, word-finding ability, comprehension, and repetition were all normal. His reading and writing were appropriate. His fund of knowledge was intact.

Cranial Nerves. His tongue deviated to the left on attempted protrusion. The surface of the tongue on the left side was wrinkled, and muscular fasciculations were present. All other cranial nerves were intact.

Motor Systems. His right upper and lower limbs were noticeably weaker than those on tile left. He had elevated deep tendon reflexes in the right limbs and increased muscle tone in both right limbs. A Babinski reflex was present on the right. All other regions were intact.

Sensory Exam. All sensory systems were intact. There was no loss of pinprick or thermal sensation, no loss of vibratory, discriminative sensation, and no loss of proprioception throughout his body.

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

Case 8

A 60 year old man was noticed by his son as suddenly acting confused and having slurred speech. Neurologic exam indicated disorientation and he had poor memory of recent events. He confused the right and left sides of his body. Ocular movements were all intact but he had a right homonymous hemianopsia. Pupillary light, corneal, gag and jaw-jerk reflexes were normal. The tongue behaved normally. When asked to smile, his facial features responded symmetrically; when smiling in response to a joke only the left side smiled. There was marked weakness of the right arm and leg with increased deep tendon reflexes. Pain and temperature were normal on the right side but discriminative touch and proprioception were reduced.

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

CASE 9

A 60 year old man was suddenly stricken with paralysis of his right arm and leg that later became spastic with increased deep reflexes and a positive Babinski. There were ataxic movements on the left extremities. The muscles of the lips and cheeks were weak on the right side but he could tightly close both eyes and wrinkle his forehead symmetrically. An internuclear ophthalmoplegia was observed in which the left eye would not adduct on attempted lateral gaze to the right although both eyes converged on near objects. There was loss of vibratory sense and discriminative touch from the right side of the body. When protruded the tongue deviated toward the right.

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