Neuroscience Small Group Exercise 2

Case 1
An 85-year-old man is brought to the ER by his family because of increasing lethargy and confusion. He has fallen at home twice in the past few weeks, but sustained no obvious injury. He was not intoxicated, and has had no seizures or stroke history.

On examination, you note that he is arousable, answers some simple questions and then falls asleep. He does not cooperate fully, but on your limited evaluation you note that he can barely lift his left upper and lower limbs off the bed. The reflexes in his left upper and lower limbs are 3+, being 2+ on the right, with a left Babinski sign. You are called away briefly for another emergency, and return to find him even harder to arouse. His right pupil reacts more sluggishly to light now, and has gotten larger (4 mm) than that on the left (2 mm).

1. Where is the responsible lesion for his left hemiparesis?

2. Why is he so sleepy?

3. What do the pupillary findings mean?

4. What is the likeliest pathology here?

5. What diagnostic testing is indicated?

6. What do you think happened to this patient?
Case 2

A 79-year-old woman became suddenly dizzy, felt short of breath, and fell to the floor without losing consciousness. She was taken to the Emergency Room and treated for an acute myocardial infarction with cardiogenic shock. After being stabilized for the next week in the intensive care unit, she underwent coronary artery bypass grafting and mitral valve replacement. Although the surgery went well, on the second postoperative day the nurses saw that she was not moving her left limbs. She has a history of elevated cholesterol and hypertension.

On examination, she is still on a mechanical ventilator in the Surgical ICU. She appears awake and can follow some of your commands, such as "open your eyes, now close your eyes." She keeps looking off to the right, and only rarely turns her eyes to her left. She nods to acknowledge items you display in her right visual field, but does not see those to her left. Her pupils are equal and reactive to light. Her left lower face appears droopy. Other cranial nerves appear intact or are untestable at this time. She moves her right limbs to command, with full strength, but her left limbs are flaccid and plegic. Her reflexes are 2+ and equal, with a left Babinski sign. She responds to pinching of her right limbs, but not on her left.

1. What type of visual field deficit does she have, and what is the responsible lesion?

2. What lesion could account for her left hemiplegia and sensory impairment?

3. What is the likeliest pathology causing this lesion?

4. What diagnostic testing do you recommend?

5. What vascular territory is involved here?

6. During her recovery over the next week, the severe left hemiplegia persists. When you ask her to move her left hand, she moves her right hand instead. She claims her strength is fine on both sides. You lift up her paralyzed left arm and hold it in her normal right visual field, asking her, "Whose arm is this?" She answers, "Yours." What is this problem called?
Case 3

A 38-year-old woman has not felt right since "twisting her lower back" two months previously. Her feet were numb and felt "cold like ice", and this numbness ascended up to her waist over 3-4 days. Her left hand became numb, and she readily dropped utensils. At times her knees would tend to buckle when walking, at which time she also felt dizzy and "swaying." She was otherwise healthy.

On examination, there was a vague patch of visual loss in the inferior portion of her right eye. Visual acuity was 20/25 left, 20/40 right, with sluggish pupillary light reflex on the right. The optic discs were normal. There was a mild lateral nystagmus only when looking to the right. Other cranial nerves were normal. Her gait was wide-based and unsteady. Limb tone and strength were normal, although her left hand was clumsy. Reflexes were equal at 2+ in the upper limbs, and 3+ in the lower limbs without Babinski sign. Vibration sensation and position sense (proprioception) were impaired at the ankles and stereognosis was impaired in the left hand. No dysmetria was found.

1. What lesion could account for her visual symptoms and findings?

2. What lesion could account for her ataxic gait?

3. What lesion is suggested by her symptoms of numbness and "coldness" in the lower limbs, despite normal touch, pinprick (pain) and temperature sensation on clinical examination?

4. What lesion could account for the trouble with her left hand?

5. What disorder of the central nervous system could account for the lesion(s) noted in questions 1 through 4 above?

6. What diagnostic testing should be done?

7. What do you think happened to this patient?