CHAPTER 31A
Case History Problem Solving: Part II General Case History Review with Correlation to Illustrations

PHOTO SERIES

Each series of photos is derived from a particular case history. Indicate the most likely diagnosis in terms of localization and pathology.

Then use the photos for the following problem solving case histories.

Figure 31-1.

Figure 31-2A. Lt oblique

Figure 31-2B. Rt oblique

E. M. Marcus et al., *Integrated Neuroscience*

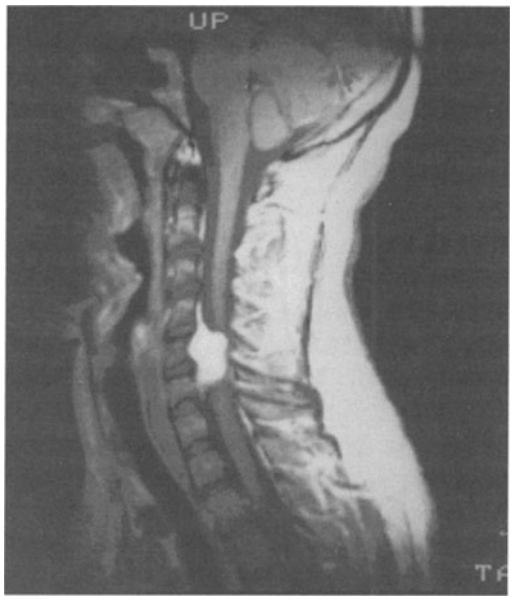


Figure 31-3A.

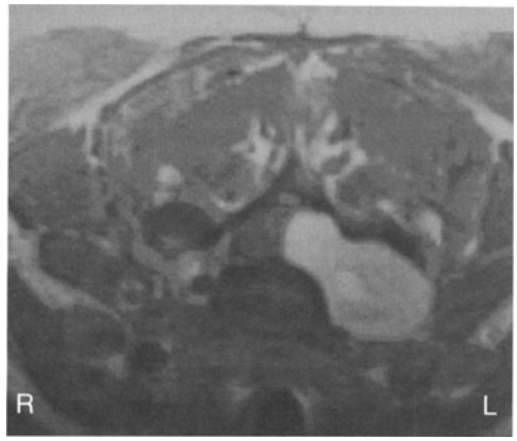


Figure 31-3B.

Figure 31-4A

Figure 31-4B.

Figure 31-4C.

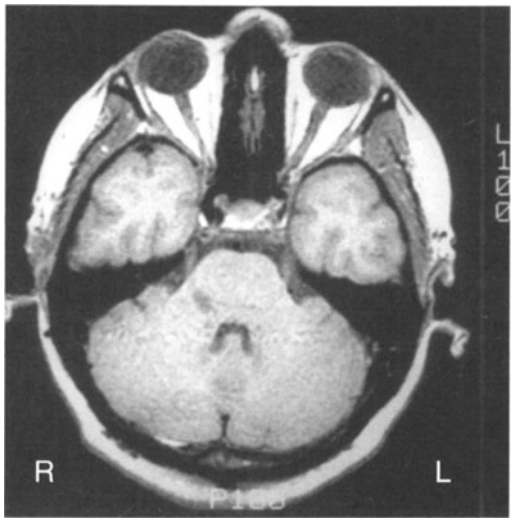


Figure 31-5A.

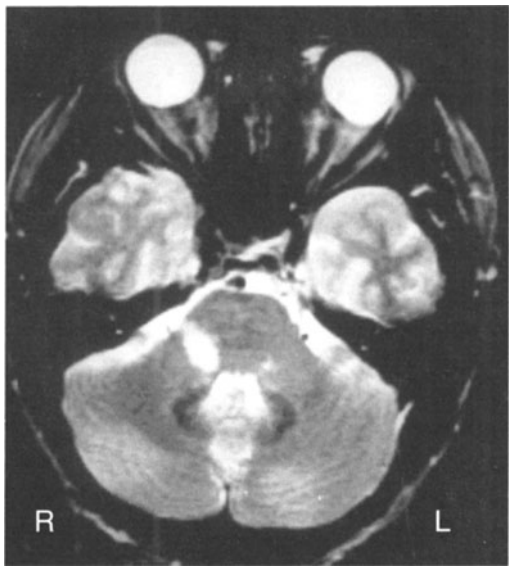


Figure 31-5B.

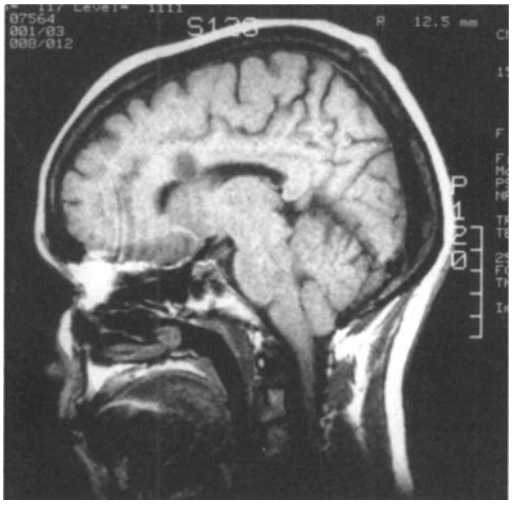


Figure 31-5C.

Figure 31-5D.

Figure 31-6A.

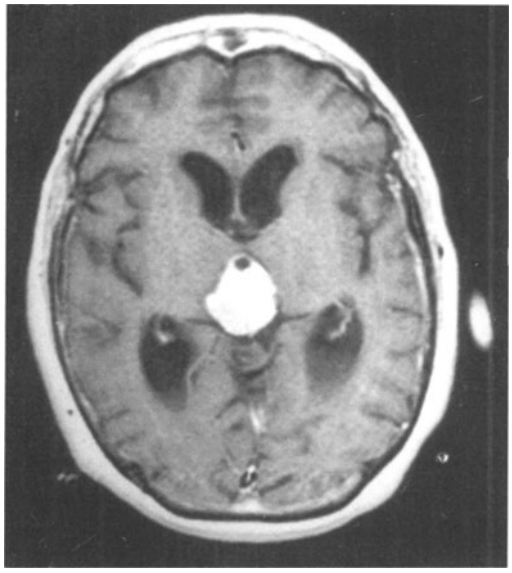


Figure 31-6B.

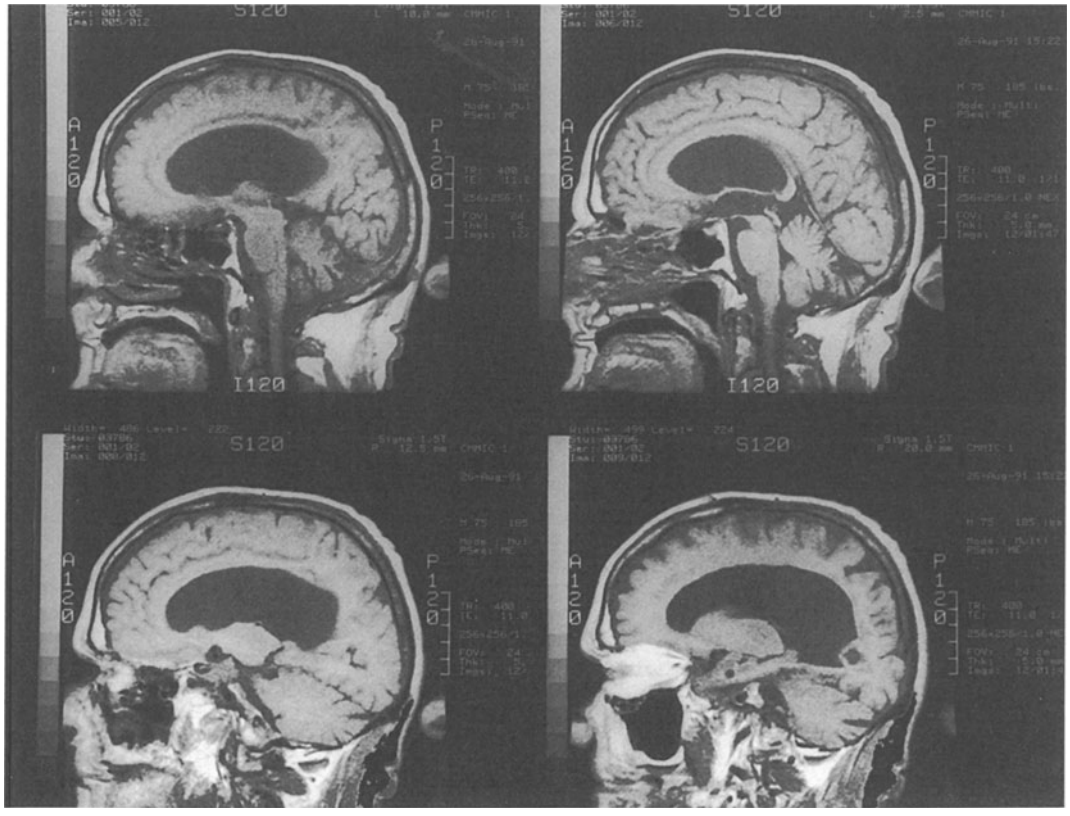


Figure 31-7.

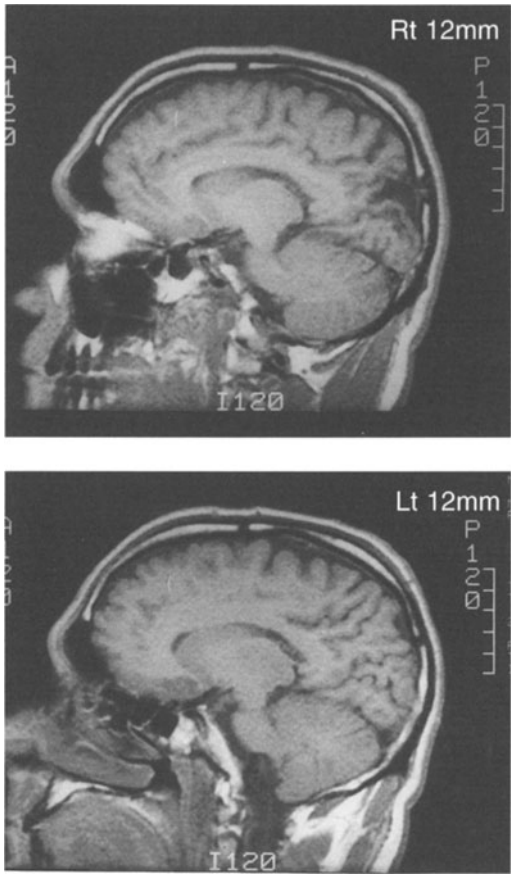


Figure 31-8.

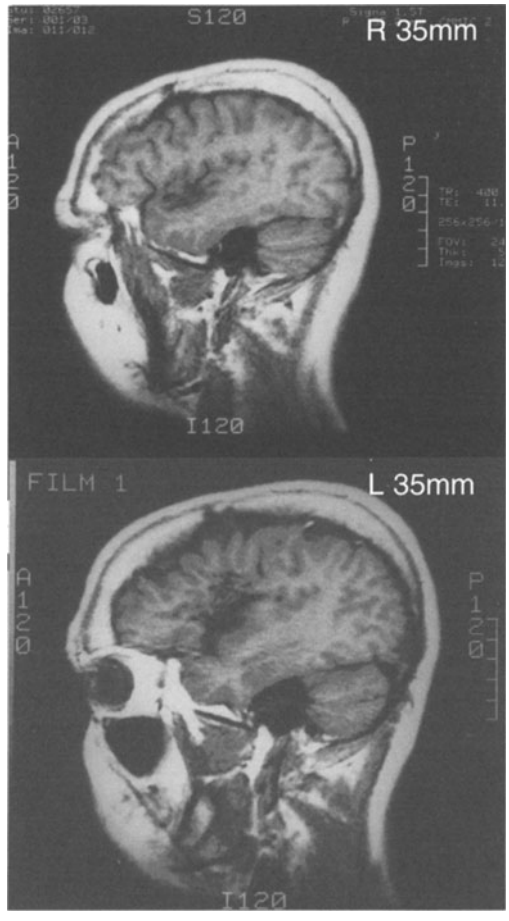
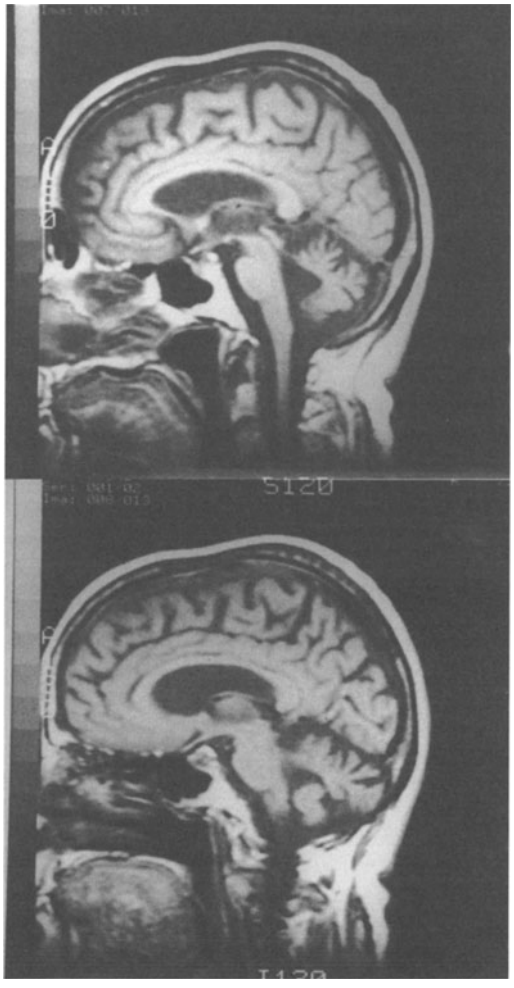


Figure 31-9.



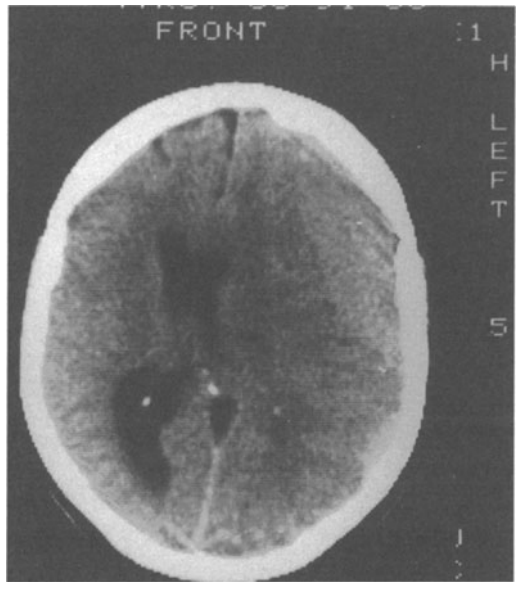


Figure 31-12.

Figure 31-10A and 10B..

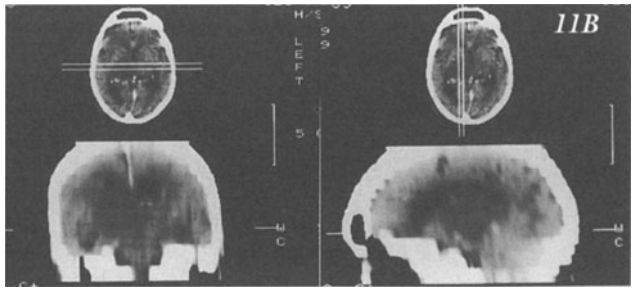


Figure 31-11A and 11B.

Case 31A-1: This 43-year-old right-handed white male, two months prior to admission had the acute onset of blurring of vision and possible diplopia. Two weeks prior to admission, he had the acute onset of ataxia, vomiting, dizziness, and left face numbness. He improved, then developed severe problems with balance, slurring of speech and difficulty in the use of the left arm, which he labeled as "weakness". The patient was also aware that he had become emotionally labile. Cranial nerve examination demonstrated a paralysis of conjugate lateral gaze to the left. A marked left peripheral facial weakness was present. He had a marked decrease in whisper perception in the left ear. Strength was actually intact. There was a marked dysmetria on the left finger-to-nose and left heel-to-shin tests. The patient was ataxic in walking. Deep tendon reflexes were symmetric, plantar responses were extensor bilaterally. Sensory examination was normal.

QUESTIONS:

1. What is the most likely diagnosis in terms of localization and pathology

2. What study would be most diagnostic or confirmatory of your clinical diagnosis?

3. Select the most appropriate photograph.

Case 31A-2: This 68-year-old right-handed married white female and retired clerical worker was referred for evaluation of "weakness in both lower extremities" of approximately two years duration. She had been falling for at least one year. Although the patient and her husband initially denied any bladder symptoms, her daughter, a nurse, was able to indicate that urinary incontinence had occurred on several occasions during the last year. The patient indicated her memory had been "bad" for 1 to 2 years. Her husband minimized this symptom. Her daughter subsequently was able to relate a more significant impairment in mental functions. The patient's mother, age 88, had senile dementia and problems walking.

NEUROLOGIC EXAMINATION:

1. *Mental status:* The patient was oriented to time, place and person. Delayed recall was 0 / 5 in 5 minutes without assistance: 4 /5 with assistance.

2. Cranial nerves: the following findings were present:

a. Tremor of head.

b. Hyperactive jaw jerk.

c. Positive glabellar sign.

3. *Motor system:* the following findings were present:

a. Variable generalized weakness that at times disappeared.

b. Gait: Small steps, at times waddling, unsteady on the turns.

c. Sitting: Often tended to fall backwards on the examining table.

4. *Reflexes:*

a. Deep tendon reflexes were everywhere hyperactive.

b. Plantars responses were equivocally extensor bilaterally.

c. Grasp reflex was released bilaterally.

d. Palmomental responses were positive bilaterally.

5. *Sensory system:* Intact.

QUESTIONS:

1. Considering the combination of ataxia of gait, impairment of memory, and urinary incontinence, indicate the most likely syndrome.

2. How do you interpret the bilateral release of grasp, the palmomental reflex, the bilateral extensor plantar responses, and the hyperactive jaw jerk?

3. Provide a differential diagnosis of this syndrome.

4. Which study or studies would you obtain to confirm your diagnosis?

5. Select appropriate illustrations (several may be appropriate).

6. If this patient also had severe impairment of upward gaze and headache, what would be the most likely diagnosis and which would be the most appropriate illustration.

7. If this patient also had a past history of head trauma with resultant coma and recovery 10 years previously, what would be the most likely clinical diagnosis and which illustration would then best correspond?

8. What is the most appropriate therapy?

Case 31A-3: This 47-year-old right-handed married white female farm manager awoke one week before evaluation with numbness and "novocaine-like" sensation involving the entire trigeminal distribution on the right, including the tongue, lip, mucosa, etc. She had no pain and no other neurologic symptoms. Five to six years previously, she had intermittent unsteadiness that was attributed to an "inner ear infection". She also was aware that during the last year, if she sat in a hot tub, she would be totally exhausted.

NEUROLOGIC EXAMINATION:

This was entirely within normal limits except for a selective decrease in touch sensation involving the entire distribution of the right trigeminal nerve, including mucous membranes, gums, upper and lower right half of the tongue and upper and lower lip. Touch sensation was also decreased over the right cornea. In all areas, pain sensation was intact. Graphesthesia over the face was intact.

SUBSEQUENT COURSE:

All numbness disappeared approximately two months after onset. She returned five months later with complaint of one-week duration of "feeling slightly woozy". Neurologic examination was not remarkable. Symptoms were reproduced by rotation.

QUESTIONS:

1. What is the location of the lesion corresponding to the sensory symptoms involving the face?

2. What is the appropriate neurodiagnostic study? What other studies might be obtained

3. Select the appropriate illustration.

4. What is the most likely clinical diagnosis?

5. Which therapy would you recommendÏ

Case 31A-4: This 70-year-old right-handed white widow and retired telephone company clerk was referred for evaluation of unsteadiness in walking, which had been present for 23 years. The symptom had begun in relationship to a hospitalization for a myelogram. At that time, the patient had been involved in an automobile accident and had developed lumbar radicular pain. The evening after the myelogram, she had developed "coma, convulsions, and a temperature of 110°.

The medical records of that hospitalization were not complete but did indicate she had a prolonged, markedly elevated temperature (> 104°F.) secondary to meningitis.

At that time, the patient also had the onset of episodes of tinnitus, vertigo, olfactory hallucinations of roasting meat, a sense of de'ja vu and the sensation of hearing a symphony. She would be observed to be glassy-eyed and inattentive.

Past history indicated the following:

1. Cervical disc surgery at age 30.

2. Lumbar disc surgery at age 38 and age 60.

3. Hyperthyroidism had been treated with radioactive iodine. She was receiving thyroid replacement.

4. Diabetes mellitus had been treated with insulin for 5 years.

NEUROLOGIC EVALUATION:

1. *Mental status:* Intact.

2. *Cranial nerves:* Intact.

3. *Motor system:*

a. Strength intact.

b. Stance: Unsteady on a narrow base and only slightly worse with eye closure.

c. Gait: Unable to walk a tandem gait, unsteady on the turns.

d. Finger-to-nose test and heel-to-shin tests were not remarkable.

4. *Reflexes:*

a. Deep tendon reflexes: Achilles reflexes were absent bilaterally.

b. Plantar responses were flexor.

5. *Sensory system:*

a. Pain sensation was decreased to the knees bilaterally.

b. Vibration sensation was absent at toes and decreased at ankles.

c. Position sensation was intact.

SUBSEQUENT COURSE:

The neurologic examination did not change over the next two years.

QUESTIONS:

1. As regards the ataxia of stance and gait present since the hospitalization 23 years previously:

a. Indicate the location of lesion.

b. Indicate the most likely pathology.

c. Indicate best study to demonstrate a. & b.

d. Select the appropriate illustration.

2. As regards the episodes characterized by sensory perception of "roast meat odor", "music of a symphony", tinnitus and vertigo, etc.:

a. Indicate diagnosis.

b. Indicate most likely etiology.

c. Select the best test to support diagnosis.

d. Indicate the most appropriate treatment.

3. As regards the absent Achilles reflexes, the decreased vibratory sensation and distal decrease in pain sensation:

a. Indicate diagnosis.

b. Indicate the most likely pathology.

Case 31A-5: This 70-year-old single right-handed white male priest had been unsteady for at least 1.5 years. He had been stumbling over names for the same period but had no other problems in memory. Urinary symptoms were denied.

Past history indicated atrial fibrillation in the past. Hypertension had been under treatment for 10 to 20 years. There was no definite history of cerebrovascular disease.

Family History: A niece had hydrocephalus that was shunted when she was a child. Two of four sisters had cerebral aneurysms.

NEUROLOGIC EXAMINATION:

1. *Mental status:* Oriented for time, place and person. Delayed recall without assistance 0 out of 5 objects in 5 minutes, with assistance 3 out of 5 objects.

2. *Cranial nerves:* Intact, including fundi, except for hyperactive jaw jerk.

3. *Motor system:*

a. Strength intact.

b. Stance: He was relatively steady until he closed his eyes.

c. Gait: He walked on a broad base but was able to do tandem gait. He was unsteady on the turns.

d. Finger-to-nose test demonstrated a slight terminal tremor.

4. *Reflexes:*

a. Deep tendon stretch reflexes were 2 in the upper extremities, 3 at the patella, and 2-3 at Achilles tendon.

b. Plantar responses were extensor bilaterally

c. There was no release of instinctive grasp.

5. *Sensory system:*

a. Position sensation was intact at fingers and toes.

b. Vibration sensation was absent at toes, decreased at ankles, and markedly decreased at fingers compared to wrist, and at wrist compared to elbows.

c. Pain sensation was decreased at toes to mid arch and over fingers.

QUESTIONS

1. As regards ataxia of stance and gait: Localize the lesion. Indicate the pathology.

2. Indicate best test to support the diagnosis.

3. Select the two best illustrations that would correspond to this case.

4. Does this patient also have another neurologic disorder?

SUBSEQUENT COURSE:

The patient had periodic neurologic follow-up evaluations. He was relatively stable over the next 4 years; then he reported a

minor increase in the degree of unsteadiness. Two years later, he developed a sudden onset of diplopia in looking to the left and a minor ptosis of the left lid. Examination now demonstrated:

1. Chronic atrial fibrillation.
2. Moderate ptosis of the left lid.
3. Weakness of the left lateral rectus movements.
4. Decreased hearing in the left ear.
5. Deep tendon reflexes increased on the left.
6. Pain sensation decreased over the entire right side, including the face.
7. Patient stood on broad base and walked with small steps on broad base.

His diplopia cleared, but previous neurologic symptoms and signs remained.

QUESTIONS

5. As regards this last sudden episode, localize the pathology. Indicate the nature of the pathology.
6. Indicate the best study to support the clinical diagnosis.
7. Does any illustration correspond to this episode?

Case 31A-6: This 36-year-old right-handed white male lecturer was referred for evaluation of symptoms related to a motor vehicle accident that occurred 2.5 years earlier. He had initially symptoms in the neck and right arm, but these essentially cleared. A more persistent area of symptomatology related to the lumbar area. Occasional sharp pains extended from the back to the left buttock, the left posterior thigh, the posterior calf and the ankle. Back pain improved but left leg pain increased. In addition to the shooting pains in the left leg, he complained of intermittent numbness in the left posterior thigh. He denied weakness, bladder or sexual dysfunction. There were no symptoms in the right leg, except for occasional burning in the anterior tibial area.

NEUROLOGIC EXAMINATION:

Totally intact except for the following:

1. *Reflexes:* slight decrease in the left patellar reflex and a marked depression of both Achilles deep tendon stretch reflexes.
2. *Back:* The patient could forward flex to 60° to the vertical plan, at which point he complained of pain shooting down the left posterior thigh.
3. *Straight-leg-raising:* This was limited to 50 to 60° on the left, with pain in the left posterior thigh. On the right, straight-leg-raising could be carried out to 90°.
3. *Sciatic nerve:* Tenderness was present on the left.

QUESTIONS:

1. What is the clinical diagnosis? Be specific as to the localization and pathology.
2. Assuming that this patient had *not* responded to "conservative" measures, which diagnostic study would you obtain? Be specific.
4. Select the illustration - corresponding to this case.
5. Define "conservative measures".
6. What therapy would be recommended if these measures had failed and pain progressed?

Case 31A-7: This 27-year-old right-handed female college maintenance worker developed progressive numbness in the left arm extending from the elbow to all of the fingers. Initially, this was intermittent, but it soon became constant. She also developed persistent discomfort in the posterior cervical area extending to the left supraclavicular area. There was no history of trauma. Her primary physician obtained initial X-ray studies and, subsequently, referred the patient to a neurosurgeon.

QUESTIONS:

1. What is the differential diagnosis at this time?
2. What initial study would you, as the primary physician, obtain?
3. Select the appropriate illustration.
4. Based on that illustration, what is the most likely diagnosis?

SUBSEQUENT COURSE:

The neurosurgeon found the deep tendon reflexes absent at the left biceps and triceps. He requested a more definitive neuroimaging study. Based on that study, the neurosurgeon performed definitive neurosurgical procedures. The patient had an excellent result, except for residual numbness in the fingers of the left hand and a left Horner's syndrome.

QUESTIONS:

1. Which definitive study would you, as the neurosurgeon, have requested?
2. Select the appropriate illustration.
3. Based on the illustration, what is the most appropriate diagnosis?
4. Which neurosurgical approaches (procedures) were utilized?
5. Why did the patient have residual sensory deficit in the thumb and index finger?
6. Why did the patient have a residual Horner's syndrome?

SUBSEQUENT COURSE:

Six months after her last surgery, she returned to the neurosurgeon, complaining of burning pain in the right scapular area and some intermittent tingling of the fourth and fifth fingers of the right hand.

Examination 6 months later demonstrated:

1. *Cranial nerves:*

a. Mild ptosis of the left eyelid, a smaller pupil on the left, and decreased sweating over the left side of the face.

b. Whisper perception was decreased bilaterally.

2. *Motor system:* There was mild weakness in the right triceps muscle.

3. *Reflexes:* The triceps and biceps deep tendon reflexes were decreased on the left, but the radial and finger jerks were increased on the left. Plantar responses were flexor.

4. *Sensory system:* Pain sensation was decreased over the thumb and index finger and to a lesser degree over the middle finger of the left hand.

5. *Neck and supraclavicular areas:* She was tender over the right supraclavicular area, with pain extending into the right arm.

QUESTIONS:

7. What is the diagnosis of this new problem involving the right arm?
8. Which diagnostic procedure would you request?
9. What is the explanation for the smaller left pupil, mild left lid ptosis and decreased sweating over the left side of the face?
10. What condition might concern you regarding the bilateral deficit in hearing? How would you evaluate this problem?

Case 31A-8: This 20-year-old left-handed white male was the product of a prolonged delivery. The mother claimed, "the head was held back." The day after birth, a seizure occurred. At age 10 months, he was noted to have problems in movement of the right arm and leg. He was still unable to stand at 14 months of age. When he was evaluated at the Children's Hospital Medical Center at age 2 years, he was described as having a spastic and dystonic right hemiparesis, with severe delays in expressive speech. At age 4 to 5 years, he began to have frequent seizures, which began with tingling of the right hand and face, and focal movements of the right hand and lips. These would secondarily generalize 3 to 4 times per day.

Family History:

The mother had a long-standing mild right hemiparesis, with focal sensory seizures involving right face and arm. A brother carried a diagnosis of schizophrenia.

QUESTIONS:

1. What is your clinical diagnosis (location of lesion, type of pathology) at this point?
2. What study would have best demonstrated the location and nature of the pathology?
3. How would you manage the seizures?
4. How would you manage the spastic dystonic right hemiparesis and expressive speech delay?

SUBSEQUENT COURSE:

He had undergone, at age 11, a heel-cord-

lengthening and toe-tendon-stretching operation.

At school, he had achieved third grade proficiency in reading and writing and tenth grade proficiency in math.

The patient was seen again 10 years later for a second opinion regarding seizure control. Over the intervening years, seizures had occurred at variable frequency. His seizures were primarily focal motor seizures beginning in the right arm. At times, secondary generalization might occur, particularly when flurries of focal seizures occurred. Often a warning occurred, which he could not precisely identify but which had components of a dreamy, strange, or familiar sensation. Over the years, he had been treated with phenytoin, phenobarbital, valproic acid, carbamazepine and primidone. Despite this, seizures were still occurring in flurries 3 to 4 days per week.

NEUROLOGICAL EXAMINATION:

1. *Mental status:* He was oriented for time, place and person. Delayed recall was five out of five in five minutes. Later, neuropsychological testing indicated that visual non-verbal learning was performed at a much higher level than auditory verbal learning. Reading, spelling, and arithmetic were all severely impaired.

2. *Cranial nerves:* There was smallness of the right side of the face.

3. *Motor system:*

a. There was smallness of the right hand, thumb, arm, and foot.

b. There was a right-sided weakness of the distal hand muscles, wrist extensor, and triceps.

c. Patient walked with a hemiplegic posture. The right arm was flexed at elbow and there were dystonic movements of the right hand. The leg was extended at hip, with external rotation and circumduction.

d. There was marked resistance to passive motion at the right shoulder and ankle ("tight Achilles tendon"). With rotation of the head, significant alterations occurred in the degree of spasticity in the flexors and extensors at the right elbow.

4. *Reflexes:*

a. Deep tendon reflexes were increased on the right.

b. Plantar responses were extensor on the right.

5. *Sensory system:* Intact for all primary and cortical modalities.

QUESTIONS:

5. Indicate your diagnostic approach.

6. Today, what would be the best study to indicate the location, extent, and nature of the lesion?

7. What would you expect the electroencephalogram to demonstrate?

8. Indicate your therapeutic approach at this point.

6. Discuss the alteration in the spasticity of flexors and extensors at the elbow on rotation of the neck.

Case 31A-9: This 18-year-old right-handed white male was the product of a prolonged delivery that apparently was complicated by "umbilical cord around the neck". "He did not breathe well at birth and may have aspirated." Three generalized convulsive seizures occurred at birth, and generalized convulsive seizures recurred with vaccination at 9 months of age and then once every 6 to 12 months. No seizures occurred from age 7 to age 15 years. Seizures then recurred in relation to reduction of medication. Warning symptoms preceded most seizures. He would sense a trembling of the extremities, and then vision would black out for 1 to 2 minutes while he was still standing and able to think. Then he would fall down and would be tonic/clonic for 1 to 2 minutes, with grater involvement of the left side. He would be "sleepy and confused afterwards". He was described as having average performance in school but reading had always been slow.

NEUROLOGICAL EXAMINATION:

Intact except for:

1. Slight clumsiness in movements of the left hand.

2. Deep tendon reflex increased on the left.

SUBSEQUENT COURSE:

The patient did well with no seizures for five years. Then he had the onset of "trance-like episodes." According to the patient, he would note slurring of speech and then would be unaware of the environment. According to his father, he would appear to stare for one minute and would not speak for one minute. There would be slight rigidity of both arms, but he would not fall to the ground, and there would not be a generalized convulsive seizure. At the end of the episode, he would be "fully aware of his environment." No automatisms would be noted during or after the episode. With adjustment of medications, the episodes were again controlled. Episodes recurred seven years later and then, after eight more years, more frequently (one to three episodes per week).

Several years later, he had a more prolonged episode, beginning with a "seasick sensation and problem with vision of the left eye" and continuing with prolonged confusion. He was "incoherent for 30 minutes and confused for an additional 30 minutes." Eventually, with additional adjustment of medication, control was again eventually achieved.

QUESTIONS:

1. What is your diagnosis?
2. Where is the pathology located?
3. What is the nature of the pathology?
4. This patient had multiple electroencephalograms. Indicate the possible findings.
5. Which medication would you utilize in management of this patient?
6. Which neuroimaging study would best demonstrate the location and nature of the pathology?
7. Select the illustration, which best correlates with this case.