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Challenging Cases in Neurology

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- Patricia E. Greenstein, MD, MB.BCh: No financial relationships to disclose.

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CHALLENGING CASES IN NEUROLOGY

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Case 1: Relentless arm pain

- Mr. RJ is a 55 year old right handed man who works as a sewer superintendent.
- For the past year, he complained to his PCP that he has pain that starts at the back of the right shoulder. The pain never disappears, and radiates down the medial surface of the whole arm. He notes that the right hand is weak. There are no symptoms in the left hand.
- He reports that he was exposed to toxic chemical in the workplace.
- He has a 36 pack year tobacco history and still smokes one pack per day. He stopped drinking several years ago.
- This pain has been relentless and he has tried Celecoxib, Gabapentin and Tramadol. He gets vague relief from Hydrocodone.
- He continues to work with the pain.
- It was recommended to him by his PCP to try physical therapy.

Normal General Examination

- He looks well. The blood pressure was 130/60 with a heart rate of 96/minute in sinus rhythm.
- Examination of the head and neck was normal. There was no adenopathy.
- The rest of the general examination was normal.

Neurological Examination

- Mental Status: Normal.
- Cranial Nerves: The pupils are 2mm round and reactive to light. There is no ptosis.

  The rest of the cranial nerve examination is normal.
- Motor Examination: There is atrophy of both deltoids. There is weakness of infraspinatus bilaterally. The legs were normal.
- **Sensory Examination: Light touch was severely reduced and pin and cold were absent on the right medial forearm and arm. This extends up toward the axilla, but there is normal sensation in the axilla.**
- Reflexes: The deep tendon reflexes were absent at the biceps and right triceps, with absent ankle jerks. The toes were downgoing.
- The remainder of the neurological examination was normal.

Where is the problem?
What is the pathology?

Two weeks later….

- Mr. RJ called the office requesting a refill of Oxycodone. He had used 40 tablets in 7 days.
- An MRI scan of the cervical spine demonstrated mild cervical spondylosis with foraminal narrowing at C5/6.
- This result did not explain the pain in the arm and nerve conduction studies were ordered.
- On the day of the test, he asked to speak with his neurologist who re-examined him and found weakness of the right abductor pollicis brevis and right abductor digiti quinti muscles.
- A diagnostic test was ordered urgently.

Pancoast Tumor Syndrome

- Lung cancer (usually squamous) located in the apex of the lung.
- Extends to C8 & T1/T2.
- Shoulder pain radiating in ulnar distribution down arm.
- May involve cervical sympathetic nerves → Horner's syndrome (ptosis, miosis, anhidrosis).

Pancoast Tumor Syndrome

- Symptoms:
  - Shoulder pain ("arthritis").
  - Root pain in ulnar nerve distribution.
  - Classical symptoms of lung malignancy - cough, hemoptysis, anorexia, weight loss may/may not be present.

Case 2: Sudden onset vertigo

- JM is an 84 year old woman with a past history of multiple abdominal adhesions and small bowel obstructions following gall bladder surgery.
- She is an otherwise healthy woman who is extremely active and swims vigorously for one hour each day.
- One morning, she had cereal and a banana for breakfast/lunch, worked during the day, then drove over to her mechanics to pick up her car which was in the shop. As she was walking into her office she suddenly felt a wave of nausea and was unsteady on her feet. She had to hold on to a bar to help maintain her balance.
- She then felt lightheaded and lay down. She had to be driven home, and helped into the house. She continued to feel lightheaded and nauseated with increasing waves of nausea especially after sudden head movements.
- The sensation would stop when she held her head still. She went to bed and noted that laying on her stomach made her feel better but she continued to have the sensations each time she moved her head. She was convinced that the food from an office party had made her ill.

History continued

- She had one similar episode in the 90s when she got up to urinate in the middle of the night and felt very woozy and slid off the toilet.
- She was given Meclizine which made her drowsy.
- By the next morning, she was not improved and with every head movement, she was quite queasy and her neighbor called 911 and she came to the Emergency Department.
- In the ED she complained of a dull, diffuse headache posteriorly.

Examination in the ED

- Blood pressure 90/74 and with fluids it recovered to 120/70
- There was no double vision.
- Extraocular eye movements are intact and there is no nystagmus.
- There was no axial or appendicular ataxia.
- She was able to walk, but complained of nausea during testing of her gait

Working diagnosis

- Is the vertigo central or peripheral?
- The patient was admitted to the medicine service and given IV fluids and Zofran with a working diagnosis of dehydration and some mild food poisoning. There was also consideration given to the fact that she may have adhesions from prior GI surgery.
- The following morning on rounds:
  - She had gaze-evoked nystagmus in both directions of gaze and was slightly ataxic when walking.

How do we think about this case?

- How do we distinguish dizziness?
- What is lightheadedness, presyncope?
- How do we distinguish central from peripheral vertigo?
- The key feature on history here is the sudden onset with a headache thereafter. In addition, she has a prolonged period of time in which she was unable to walk. We were anchoring on other causes of her nausea.
- The dissection we think was precipitated by her swimming and aggressive head turning.

Case 3: Trouble speaking

- Mr. MM is an 88 year old man with a history of hypertension who drove himself to the ED after having a 3-4 minute episode of word finding difficulty after giving a 3 hour lecture at a University where he teaches Meteorology.
- He states that he has had several weeks of these symptoms (10-15 episodes) where he initially is unable to think of the word he is trying to say then when he thinks of the word and speaks it he feels like it sounds strange.
- On the day of this episode at the end of his lecture (11am), he tried to say the word 'adiabatic' but felt he was saying it strangely. He also was having issues finding the words that he wanted to say (the students were asking him questions about the lecture). He realized he was having difficulty so he ended the lecture, walked to his car and called his daughter and thought he was back to normal.

Additional history and examination

- He has a history of well controlled hypertension and prior GI bleeding.
- Medications include: Atenolol and hydrochlorthiazide
- In the ED, the blood pressure was 172/78 with a heart rate of 68 in sinus rhythm.
- There were no carotid bruits. There was a diastolic murmur best heard at the left parasternal border.
- Neurological examination was notable for an intact mental status. There was no aphasia, no word finding difficulty.
- He did have a left chronic VI palsy.
- The remainder of the neurological examination was normal with no hemiparesis.

Test results and management dilemmas

- MRI imaging of the brain showed no acute infarction.
- There was no carotid stenosis
- There was no history of atrial fibrillation.
- He had a TTE which demonstrated severe aortic regurgitation.
- He was seen by cardiology.
- Given his history of GI bleeding in the past, is it safe to give him aspirin?
  - Yes or NO?

Issues to consider

- He was placed on aspirin 325mg daily
- He was walking back to work and slipped and fell on the ice and sustained a hip fracture necessitating emergent and a left hemiarthroplasty.
- The aspirin was discontinued for the surgery and he remained symptom free.
- Final diagnosis: Left hemispheric TIA's.
- What does the literature say about restarting an antiplatelet agent given his age, risk factors for recurrent TIA and stroke?

Case 4: Bilateral leg pain

- LG is a 56 year old avid athlete who started biking with dropped handlebars over the summer.
- He sustained a fall off the bike, as he could not disengage the cleats, did not really hurt himself and continued riding on. He also started a kettlebell class in the gym.
- For a few weeks after that, he noted some stiffness in his lower back, but motrin helped the pain and he disregarded the discomfort.

Ongoing stiffness…

- He was driving from Boston to NYC and noted the stiffness and thought that an icepack would help.
- He got out of the car in Manhattan, walked 5 blocks and then developed severe shooting pain down both legs which " caught my breath". He could not walk.
- His daughter drove him back to Boston and he contacted a physiatrist who ordered an MRI scan of his L-spine.
- The report was read as an epidural hematoma and he was prescribed bed rest and cyclobenzaprine and hydrocodone and a medrol dose pack.

Things do not improve….

- The pain continued to persist and his family reached out to friends requesting a referral to a neurologist. His PCP had referred him to a neurosurgeon who did not examine the patient, but advised conservative management for the epidural hematoma.
- He was now to the point of being unable to walk and required a cane.
- He was wheeled into the neurologist's office in a wheelchair.

The neurological examination

- He was severely limited by pain with even the slightest change in movement of his body. He would get bilateral shooting pain down his thighs. He reported urinary urgency.
- There was weakness of both hamstrings, tibialis anterior, bilateral EHL (extensor hallucis longus).
- He was hyperesthetic to pinprick bilaterally below L1
- Joint position sense and vibration sense were intact.
- The reflexes were depressed but both toes were upgoing.

Localization??

- Lower motor neuron weakness in the legs (L4/5) with areflexia should localize to the nerve roots bilaterally.
- How do we explain the upgoing toes?
  THE CONUS
- Remember that the spinal cord ends at T12-L1 and that upgoing toes means there must be involvement of the conus which is part of the cord
- **THIS IS DANGEROUS!!!!!!!!!!!!!!**
- **TOGETHER WITH URINARY URGENCY, THIS IS A TRUE NEUROLOGICAL EMERGENCY**

Happy ending

- Emergent surgery the next day, Friday afternoon at 4pm
- Findings at surgery: Large disc herniation at L1/2 with extreme cord compression.
- The patient was discharged two days later with immediate relief of the pain, ambulatory without any walking aid and doing well.

What can we learn from this?

- When do we ask for help from the neurologist in an age where we are too busy to really examine patients in detail?
- When do you disbelieve an MRI report?
- If you have the history, or the suspicion, what are 3 physical findings that are quick and easy to find?

Red flag warning signs for back pain: Remember to ask these direct questions

- Duration: Longer than three weeks
- Pain not relieved by rest
- Radicular pain (either down the arm or leg) or bilateral pain
- Midline back pain
- Pain worse at night
- Changes in bladder control: urgency and urgency incontinence
- History of new falls, walking aid
- History of cancer, fever, weight loss, chills, night sweats