Spinal Myoclonus: Severe and Life-Threatening Adverse Effect to Myelograms

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Learning Objectives

1) Present an unique case of spinal myoclonus
2) To increase awareness of prevalence, risk factors, severity, and adverse effect to myelograms
3) To review literature and treatment plans for adverse effects to myelograms including ascending tonic-clonic seizure syndrome

Patient Presentation

48 year old female with a pmhx of hypothyroidism, diabetes mellitus, and chronic back pain presented to the emergency department two days after receiving a lumbar CT myelogram for lower extremity muscle spasms and cramps. On evaluation, the patient was very agitated with acute onset of muscle spasms screaming that she was in a lot of pain. Denied any fever, chills, chest pain, shortness of breath, nausea, vomiting, and diarrhea.

Physical Exam

Vitals: Temp: 98.2, **BP: 193/82, HR: 155, RR: 28**, O2: 95% on 2L NC

General: In moderate distress, having active lower extremity muscle spasms

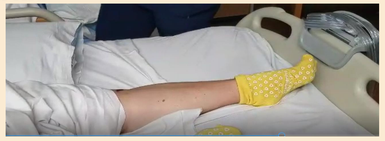
HEENT: Normocephalic, atraumatic, PERRLA, EOMI

Cardio: **Tachycardic**, distinct S1 + S2, No murmurs, rubs, or gallops, +1 lower extremity edema bilaterally. Pulses equal and intact.

Respiratory: **Wheezing bilaterally**. Increased work of breathing, currently on 2L NC

GI: Soft, non-tender to palpation, +bowel sounds, no guarding or rebound tenderness

MSK: Actively having muscles spasms, able to mover her upper extremities without problem, lower extremities rigid and difficult to bend



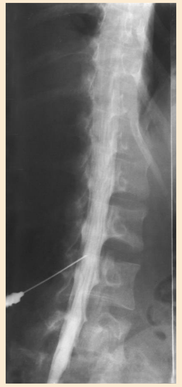
Lab Values

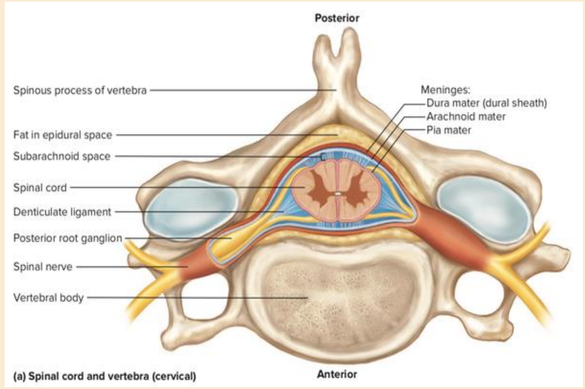
142	113	27
4.4	14	0.91

	13.5	
17.4		311
	40.3	

CPK: 1504
BNP: 160
D-dimer: 724
Lactic Acid: 1.6

Myelogram and Spinal Cord Anatomy





Inadvertent Intrathecal Use of Contrast Media for Myelography

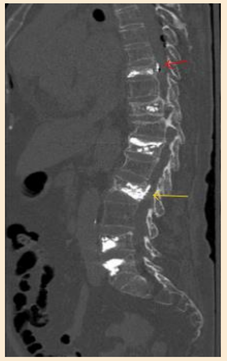
- There have been over 14 cases of adverse effects from contrast media following a myelography
- Normally seen with ionic contrast media
- The clinical presentation widely varies from the spread, location, and severity but there are several case studies highlighting tonic-clonic movements
- Reaction occurs with 30 minutes to 72 hours after contrast initiation with painful spasms of the lower extremities associated with spasms initially and then contraction
- Frequently elicited by merely touching the affected extremity
- Ascending paralysis that can lead to a generalized seizure and loss of consciousness
- Autopsy and histopathologic examination following a case report showed localized, cellular reaction of the brain and spinal cord with brain edema
- Theory that the contrast may change or destabilize the membrane potential of affected neurons resulting in abnormal function

Hospital Course and Follow Up

- Patient was intubated for airway protection and given multiple doses of benzodiazepines to help control the muscle spasms and prevent any ascending tonic-clonic seizures from occurring
- Given continual supportive care with IV fluids, benzodiazepines, and frequent neuro checks
- EEG negative for any seizure activity
- Patient was able to be extubated 48 hours after the event and able to move all extremities at that time without any muscle spasms

Ascending Tonic-Clonic Seizure (ACTS) Syndrome

1) The patient has undergone a myelographic examination during the preceding 6 hours
2) Painful tonic-clonic muscular spasm are present
3) The spams occur in paroxysms lasting approximately 15 – 30 minutes
4) The spasms may be precipitated by touching or handling the affected limbs
5) Following a lumbar myelogram, the spasms spread from the lower limbs in an ascending pattern to involve also the trunk and upper limbs
6) The patient is at first fully conscious, but becomes stuporous or comatomas as the symptoms ascend in a cephalad direction



Treatment

- Should be aimed at controlling muscle spasms and seizures to avoid pain, fractures, hyperthermia, acidosis, and muscular injury. Early intubation has been successful throughout the case studies.
- Intravenous benzodiazepines should be used first and if this does not relieve symptoms, use neuromuscular blocking agents
- Recommend continual treatment for 48 hours prior to stopping any medications
- The procedure will mask external signs of seizure, an EEG may be helpful to distinguish between ATCS syndrome from a seizure
- Steroids might have a role in preventing cerebral edema but there is no scientific evidence
- Place patient in the “head and trunk up” position as the contrast is heavier than CSF
- In refractory cases, anesthesia can perform a careful CSF exchange-washout

Take Home Points

- There are serious life threatening adverse reactions to contrast media myelograms that health care professionals need to be aware of and learn how to treat
- The ionic contrast can affect neurons leading to abnormal function causing muscle spasms, ascending tonic-clonic seizure, and / or a coma
- No definitive treatment is recommended yet but early intervention, benzodiazepines, close clinical monitoring, and in refractory cases “CSF exchange-washout” is recommended

References

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