Precipitous Painless Paraplegia: an Atypical Vascular Etiology for a Stroke Code

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INTRODUCTION:

In Emergency Medicine we are becoming increasingly aware of the cognitive pitfalls that plague our specialty as a result of our duty to make critical decisions with limited information.[1] While pre-hospital triage systems and expedited protocols for time sensitive diseases such as stroke, STEMI, and trauma have been instrumental in helping patients receive the urgent care they need, they can also lead to diagnostic error because of cognitive biases such as triage cueing or anchoring.[2] As we will see in this case, careful consideration of other differentials and use of point of care ultrasound can help emergency providers correctly diagnose illness when time is essential.

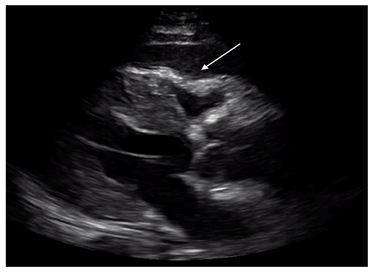
Common Types of Cognitive Bias Present in our Case. Adapted from Croskerry et al.[2]

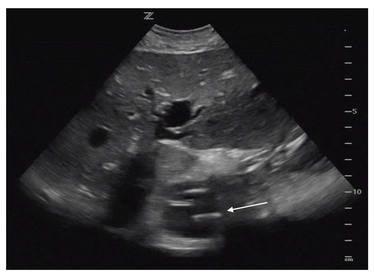
Type of Cognitive Bias	Description	Ways to Avoid
Anchoring	The tendency to fixate on certain features too early in the diagnostic process; premature closure	If possible, delay forming an impression until complete information has been obtained
Triage cueing	An initial, abbreviated assessment dictates all future care and decisions made for a patient	Be aware of the risks of mis-triage; be willing to redirect care to a more appropriate setting
Availability/non-availability	Things that are more frequent are thought of first, while uncommon diagnoses (zebras) are not considered	Combine objective information about the prevalence of a disease with the clinical evidence

CASE DESCRIPTION:

A 65 year old male with a history of hypertension called 911 for acute onset of weakness in both of his legs. He was seated at work when he suddenly fell onto the ground and began telling coworkers that his legs felt “sour.” Patient denied any back, chest, or abdominal pain. He had true lower extremity weakness so was activated as a stroke alert by paramedics. He was met in the ambulance bay for evaluation where exam was notable for complete paraplegia with sensory deficit below the waistline and absent rectal tone.

Bedside ultrasound was performed by the emergency team and images are shown below.





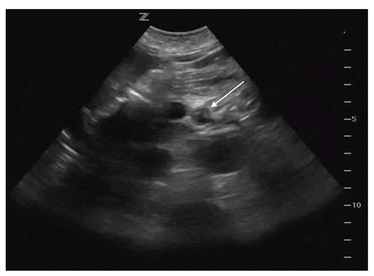


Figure A: Parasternal long echo showing moderate pericardial effusion with evidence of right ventricular free wall collapse during diastole (arrow)

Figure B: Transabdominal aortic view with pulsatile dissection flap seen in descending aorta (arrow)

Figure C: Transabdominal view of dissection flap through superior mesenteric artery (arrow)

Cardiothoracic and vascular surgery were immediately consulted and a CT scan was performed that confirmed dissection of the ascending aorta extending into bilateral iliac arteries. Patient was emergently taken to the OR for successful repair of Stanford Type A aortic dissection and was transferred to the CVICU post operatively. On hospital day 2 he became increasingly hypotensive and bradycardic resulting in cardiac arrest. Despite CPR and resuscitative efforts return of spontaneous circulation was not achieved and he unfortunately passed away.

Figure D. CTA axial slice through the aortic arch showing Stanford Type A aortic dissection with true lumen (asterisk) and thrombus within the false lumen

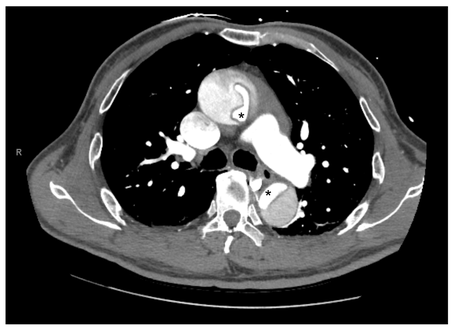


Figure E. CTA axial slice at the level of the pulmonary arteries showing a small true lumen in the ascending as well as descending thoracic aorta (asterisks)

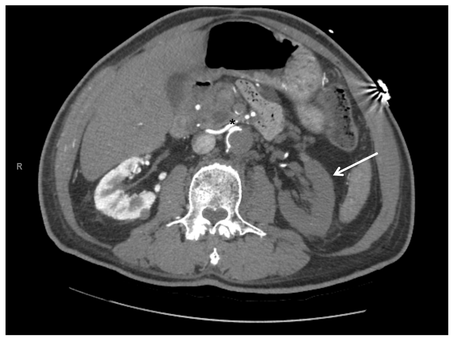


Figure F. CTA axial slice at the level of the renal arteries showing a small crescent shaped true lumen with maintained perfusion to the right renal artery (asterisk). The left renal artery originates from the false lumen and is completely thrombosed (arrow).

Figure G. CTA sagittal slice showing the extent of dissection beginning in the ascending aorta and continuing through the descending thoracic aorta

Figure H. CTA coronal slice with the contour of the abdominal aorta shown (arrow). There is near occlusion of the true lumen with only small amount of contrast reaching the level of the bilateral iliac arteries

CASE DISCUSSION:

Aortic dissection is a rare diagnosis with incidence estimated at 5-30 cases per million people per year.[3] Of those cases, painless aortic dissection is only a small fraction occurring in an estimated 5% of all aortic dissections. Painless aortic dissection has been associated with increased mortality, generally due to delayed diagnosis.[4,5] While a neurologic complaint occurs in up to nearly 30% of acute aortic dissections, paraplegia as the primary neurologic complaint is estimated at only 3% of that subgroup, making the combination of painless paraplegia as initial presenting symptom exceedingly rare.[6,7] The ability to quickly and accurately diagnose an acute dissection is critically important as mortality increases every hour that treatment is delayed.[8]

Aortic Dissection: Presenting Symptom

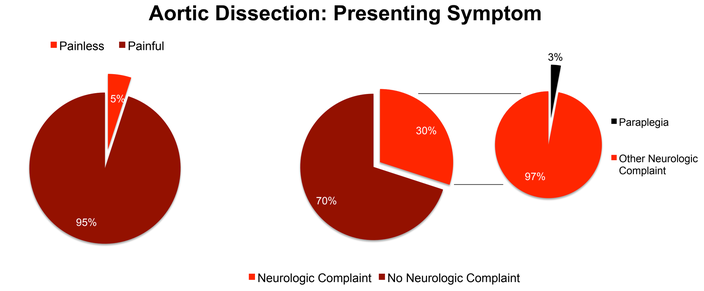
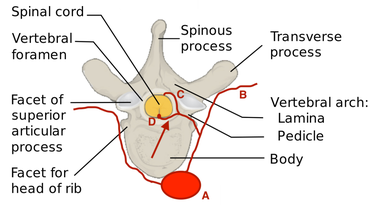


Figure I. How Does Aortic Dissection Cause Paraplegia?



Perfusion to the thoracic and lumbar spinal cord is complex. In general, there are segmental arteries at each level of the spinal cord that originate from the corresponding posterior intercostal arteries. Another major source of perfusion to the anterior spinal cord is the anterior spinal artery, which originates in the cervical cord from the bilateral vertebral arteries. By the time it reaches the lower thoracic and lumbar cord, however, a large portion of its blood supply comes from the artery of Adamkiewicz- a communicating artery that generally originates from the 9-12th intercostals. Occlusion of a large number of these radicular arteries, and especially the artery of Adamkiewicz, causes near complete ischemia to the anterior spinal cord.

CONCLUSION:

Realizing the atypical presentation and using our skills as bedside sonographers helped us to immediately diagnose the patient when the wheels of our healthcare system would have expedited him away to neuro-imaging and the true etiology would have only been discovered on autopsy.[9] There are many diseases just as life threatening as aortic dissection that can present in atypical and exceedingly rare ways, and it is crucial that as emergency providers we train ourselves to recognize when we need to take a step back from the system and evaluate patients in a different way.

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