COMMENTARY

Spinal Cord Stroke: An Uncommon Diagnosis behind Common Symptoms!!

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ABSTRACT:
Spinal cord infarction is one such disease which is quite uncommon and often goes undetected because of variation in its onset, severity, duration and presentation. Spinal cord is supplied by anterior and posterior spinal arteries.Around three quarters of blood supply to spinal cord is derived from anterior spinal artery. Mostly Spinal Cord Syndrome is due to vascular compromise pathologically or due to any iatrogenic insult. Spinal cord stroke, either ischemic or hemorrhagic presents abruptly over few minutes to several hours with severe back pain along with bilateral weakness or paralysis depending upon the site and severity of lesion. Aspirin is standard treatment along with low-dose heparin administered subcutaneously, and physiotherapy to improve motor function. Various factors like patient health, age and condition of the disease might influence clinical evolution and functional outcome. Weakness or paralysis may improve as time passes especially in those where complete infarction did not occur.

Keywords: Spinal cord infarction, Limb weakness, Vascular compromise, Variable presentation, Aspirin, Physiotherapy

INTRODUCTION:

Spinal cord infarction is one such disease which is quite uncommon and often goes undetected because of variation in its onset, severity, duration and presentation. It has been pointed out that its incidence is 1.2% of hospital admissions related to vascular pathology of the nervous system.[1]

Background of the Disease:

To explain the disease 'Spinal Cord Syndrome' we should keep arterial supply of the spinal cord in mind. Spinal cord is supplied by three major vessels; there is one anterior spinal artery(ASA) and 2 posterior spinal arteries (PSAs). Majorly (around three quarters) the blood supply to the spinal cord is derived from the anterior spinal artery. Thus the anterior portion of the cord is much more vulnerable to vascular compromise, typically presenting as an anterior cord syndrome affecting corticospinal, lateral spinothalamic, and autonomic pathways.[2]

Pathogenesis and the Vascular supply of the Spinal Cord:

The ASA supplies the anterior two-thirds of the spinal cord and PSAs supply the posterior one-third. The ASA is formed at the level of foramen magnum by intracranial vertebral arteries and receive branches at different levels from radicular branches of aorta. The ASA and PSAs anastomose distally at the conus medullaris.[3] Any pathology arising within aorta or in its branches can lead to ischemia or infarction of spinal cord with symptoms corresponding to the level of cord.[2]

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Chief Causes of the Spinal Cord Syndrome:

Mostly Spinal Cord Syndrome is due to vascular compromise pathologically or due to any iatrogenic insult, commonly local space occupying lesions compressing anterior spinal artery (such as granulomas, abscesses, tuberculoma, neoplasms, sarcoidosis etc), generalized atherosclerosis, Coronary artery diseases,hyperlipidemia, hypercoagulable states, systemic hypotension or hypovolemia, vascular malformations, surgery of aortic aneurysm, aortic dissection, any risk factor of thrombo-embolism such as atrial myxoma, atrial fibrillation, infective endocarditis, thrombocytosis etc. Any local or systemic factor compromising the perfusion of spinal cord can be the culprit.[4,5,6]

Non Vascular Causes of the Spinal Cord Syndrome:

Anterior spinal artery syndrome (ASAS) is a rare neurologic complication characterized by the sudden development of paraplegia, unusual complication of epidural analgesia used to facilitate postoperative pain relief.It can be transient or persistent, with variably preserved sensory perception due to limited blood flow through the anterior spinal artery.[7,8]

Also, there exists some literature that the pathogenesis of the spinal cord syndrome is associated particularly to cervical spondolysis, cervical spondylotic myelopathy, due to compression or may be while its corrective approach.[9,10]

Spectrum of the Disease Presentation:

Spinal cord stroke, either ischemic or hemorrhagic presents abruptly over few minutes to several hours with severe back pain along with bilateral weakness or paralysis depending upon the site and severity of lesion. Over hours to days, few or all of the following symptoms may also present in any sequence:

1. weakness or paralysis involving either all 4 limbs or lower limbs bilaterally depending upon the site of infarct
2. sensory loss distal to the lesion with relative sparing of light touch, proprioception and vibration if only anterior spinal artery is involved
3. flaccidity in acute phase followed by spasticity
4. numbness or paraesthesia
5. loss of deep tendon reflexes acutely, followed by hyper-reflexia

6. hypotension
7. sexual dysfunction
8. bowel or bladder dysfunction
9. there may be chest pain or abdominal pain prior to the onset of weakness or paralysis if the initiating event was myocardial ischemia or gut ischemia[11,12,13]

Making Diagnosis of the Spinal Cord Syndrome: Once the presentation seems enough to be diagnosed as spinal cord stroke, an immediate spinal MRI should be done which will reveal the site and nature of lesion along with any mass lesion if present.Following is the list of workup to be done in patients having spinal cord stroke to identify the etiology behind it:[14]

1. CT myelography to rule out mass lesion
2. Spinal arteriography to detect vascular lesions or malformations
3. Spinal fluid analysis to rule out infections, neoplasm or other inflammatory disorders
4. CT guided biopsy or culture may be helpful in some cases
5. Temporal artery biopsy if giant cell arteritis is to be ruled out
6. Blood complete picture along with inflammatory markers to rule out systemic vasculitis or chronic inflammatory conditions
7. Lipid profile
8. Auto immune profile
9. Electromyography (EMG)and nerve conduction velocity (NCV) to differentiate it from other disorders with same presentation such as transverse myelitis, Guillain-Barre Syndrome (GBS) and space occupying lesions in the cord

Treatment and Management of the Disease: There is no definite therapy for spinal cord infarction, once it occurred, all we can do is to prevent further ischemia, minimize the complications and reduce disability through rehabilitation. Aspirin is the standard treatment along with low-dose heparin administered subcutaneously, and physiotherapy to improve motor function. Only symptomatic treatment is all that can be offered at this time like spasticity can be treated with oral baclofen, tizanidine, and occasionally diazepam. Usually long term stay in a rehabilitation hospital is required since the neurologic disabilities are either permanent or slowly resolving. Other comorbidities such as diabetes mellitus, hyperlipidemia, hypertension or heart diseases should be strictly controlled and treated. Weakness or paralysis may improve as time passes especially in those where complete infarction did not occur.[2,14]

Prognosis and the Counseling Points:

Spinal Cord Syndrome's prognosis has not been completely determined since, given its low frequency, the published series are of few cases. Various factors such as a patient health, age and condition of the disease might influence their clinical evolution and functional outcome.Acute spinal cord ischemia is a serious disease whose functional outcome are disabling in a high percentage of patients. Best predictor of the prognosis is an advanced age. In Spinal Cord Infarct clinical (most sensitive are the ASIA motor scores) and electrophysiological (tibial SSEP) examinations are of prognostic value to predict the functional recovery and thus allow early planning of rehabilitation aims and procedures.[13]

Patient should be counseled and educated properly regarding the prognosis and outcome of the situation due to its high morbidity and disability. Patient should be advised to control risk factors and remain compliant to the medications in order to get improvement in symptoms. Sphincter disturbance is an important sequel in the whole neurological syndrome, issues of bladder and bowel control should be specially addressed. Patients should be offered rehabilitation care and their families should also be counseled for playing a supportive role.[1]

CONCLUSION:

Many patients present with bilateral lower limb weakness progressing slowly over many days but none of them are suspected to be suffering from spinal cord ischemia. While many patients remain undiagnosed or left against medical advice (LAMA) owing to any reason, it is highly possible that any of them suffered from spinal cord ischemia which is a catastrophic event with an abrupt onset and variable symptoms depending on the site involved. Hence we emphasize on physician knowledge to pick this unusual diagnosis presenting with common neurological symptoms.In future we hope that like many other neurological disorders where definite interventions are yet to be known, Spinal Cord Syndrome is also one of the challenging frontiers that need exploration in future years.

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