Case Report

Paralyzing paradox: Spinal cord infarction, a hidden emergency ☆

Khurram Khaliq Bhinder*, Khizer Ahmed Khan, Madiha Saeed Wahla, Amna Mehboob, Abeer Shahid, Alishbah Ziad

Radiology Department, Shifa International Hospital, Islamabad, Punjab 44000, Pakistan

A B S T R A C T

Spinal cord infarction is a rare entity that is encountered less but has a high mortality and morbitiy rate. 43 years old female presented to emergency department with acute lower limb weakness. Urgent MRI was performed that showed long segment intramedullary signal abnormality involving anterior and middle half of cervical spinal cord, showing restricted diffusion and possible questionable faint enhancement. Another smaller similar abnormal signal intensity intramedullary focus at T1-T2 level. No heterogenous signal or abnormal enhancement was noted in adjacent visualized vertebral bodies. Considering restricted diffusion first differential possibility is of anterior spinal cord ischemia/infarct with no fever or trauma history. This is a rare case presentation of spinal infarct in Pakistan presenting acutely.

Introduction

Spinal cord infarction is an uncommon entity when compared to ischemic brain injury. There is abrupt onset of symptoms including bilateral limb weakness, parasthesias and neck pain [1]. The clinical presentation is similar to other diseases like acute myelopathic syndromes [2]. Spinal cord infarction can de due to variety of causes like atherosclerotic disease, haemorrhage, arteriovenous malformations and aneurysms. Spinal infarcts usually follow vascular territories. The involved part of the spinal cord depends upon the etiology. It is a medical emergency and requires quick work-up and diagnosis. MRI is the most essential and sensitive modality in diagnosing spinal cord infarction [3].

So we present a case of a spinal cord infarction in a patient who presented with acute neurological problem.

Case presentation

A 43-year-old female, previously healthy, with no significant past medical history, presented to the emergency department (ED) with complaints of neck pain for 1 day followed by acute onset weakness in both upper and lower limbs along with
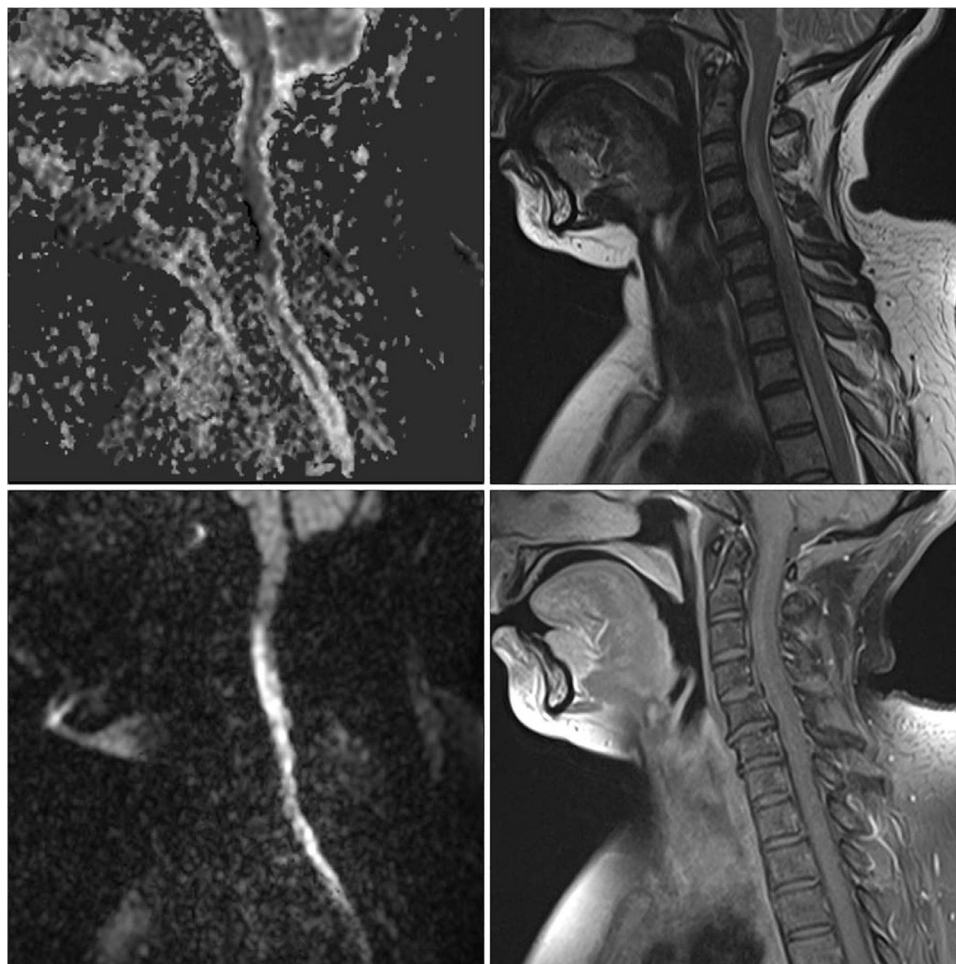
Fig. 1 – Cervical cord infarct.

moderate back pain. Upon physical examination, the patient was alert and oriented. His vital signs were within normal limits, except for mildly elevated blood pressure (140/90 mmHg).

Neurological examination revealed 0/5 in both upper and lower extremities, diminished sensation below the T1 dermatome, and impaired bowel or bladder function at presentation. There were no signs of head or cervical spine trauma, and cranial nerve examination was unremarkable. Cardiovascular and respiratory examinations were normal. The patient had no history of trauma, recent infections, or coagulation disorders.

Initial laboratory workup included complete blood count (Hemoglobin 10.7g/dL, white blood cell count 6390/uL, platelets 299000/uL), CRP 4.52 mg/L, random glucose level 113 mg/dL, cardiac markers (CKMB 1.2 ng/mL and Troponin-I < 3.2 pg/mL), BS34-ENA profile which was negative.

Magnetic resonance imaging (MRI) whole spine, performed urgently, revealed a long segment intramedullary signal abnormality involving the anterior and middle half of the cervical spinal cord and upper thoracic spinal cord. A complimentary DWI sequence was performed and an ADC map was created which showed restricted diffusion in the aforementioned areas of signal abnormalities. An MRI brain and postcontrast

CT chest were also ordered which showed no significant findings. An echocardiography was also normal.

Initially, the patient was managed with pulse doses of steroids and antiplatelets.

Additional detailed investigations to rule out other causes included negative Anti Aquaporin-4 antibodies, negative ANA (Antinuclear Antibody), Factor V Leiden, Protein C, Protein S which were within normal ranges, absent oligoclonal bands in CSF and serum, negative herpes simplex DNA, negative MOG antibodies and negative MTB DNA by PCR in CSF, blood C/S which showed Staphylococcus Caprae, urine C/S which showed no growth.

Considering the clinical presentation, laboratory investigations, and radiological findings, a diagnosis of anterior spinal cord ischemia/infarct was made and further evaluation with MRI brain and CT angiography chest was advised which ruled out other possible differentials.

After 1 week of hospital stay, the patient was discharged and the family was counseled regarding bedsore precautions, rehabilitation therapy, and use of medications. The patient's medication on discharge was Aspirin, Rosuvastatin, Omeprazole, Pregabalin, Sucralfate, Apixiban, Duloxetine, and Itopride.
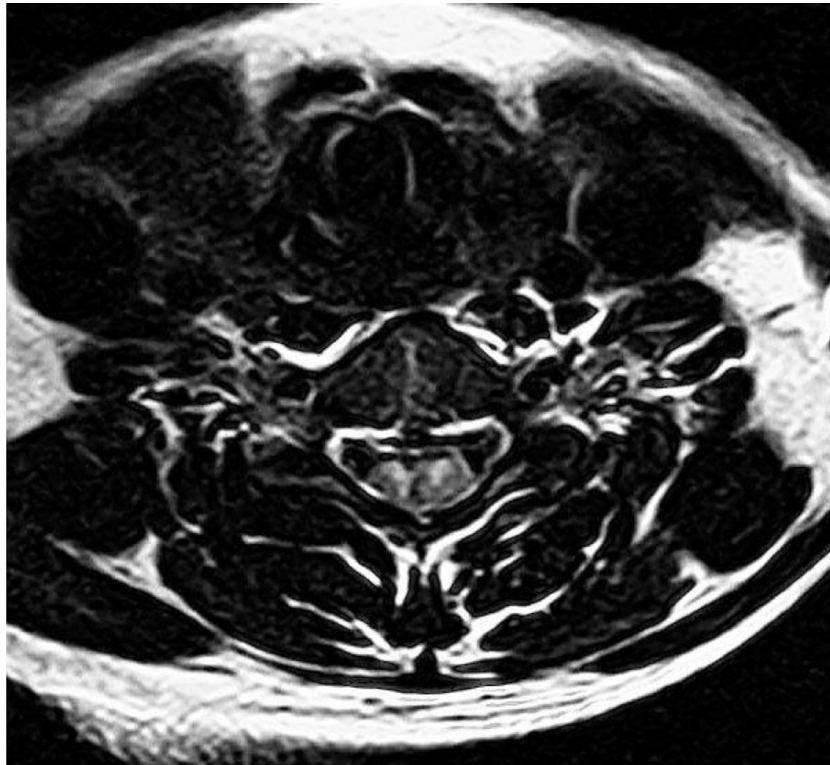
Fig. 2 – Characteristic owl eye appearance of spinal cord infarct.

On follow-up appointments, the patient was in stable condition with 1/5 power in upper limbs and 0/5 power in lower limbs and needed assistance in activities of daily living Figs. 1 and 2.

Discussion

Spinal cord infarction (SCI) is a relatiely infrequent occurrence, representing approximately 1% of all ischemic stroke cases. It arises from the occlusion of the arteries that supply blood to the spinal cord. The annual incidence of SCI is estimated at 3 cases per 100,000 individuals, making it a rare form of stroke that constitutes about 1.2% of all ischemic strokes [4,5].

A variety of pathologic conditions can produce spinal cord infarction, an uncommon but serious illness that is consistently less common than ischemic brain damage [6]. Most instances of spinal cord infarction have an abrupt onset, and only a small percentage of patients have symptoms that worsen over a few hours or minutes. The vascular region affected determines the neurologic manifestation, which can range in severity from mild weakness to paraplegia. Depending in part on the underlying etiology, the affected cord level might vary greatly. Up to 70% of instances of spinal cord infarction are accompanied with back or neck discomfort, usually near the site of the lesion [7,8].

Spinal cord infarction presents a significant diagnostic challenge owing to the low specificity and considerable variability of its associated clinical manifestations. Additionally, the differential diagnosis encompasses a broad spectrum of conditions including compressive myelopathy, infectious, autoimmune disorders and other vascular pathologies of the spinal cord, such as dural arteriovenous fistulas. Magnetic resonance imaging (MRI) is the most effective diagnostic modality for distinguishing spinal cord infarction from other etiologies of myelopathy. Diffusion-weighted MRI (DWMRI) has gained popularity in assessing the spinal cord in patients suspected of having ischemic events. DWMRI enhances the sensitivity of MRI for the identification of acute spinal cord infarction due to its reduced sensitivity to magnetic susceptibility artifacts and bulk motion effects [4,9]. While neuroimaging is used to confirm the diagnosis and/or rule out other illnesses, clinical findings are the primary basis for the diagnosis of spinal cord infarction. The best diagnostic to diagnose spinal cord infarction is magnetic resonance imaging (MRI) [10]. Despite being an uncommon occurrence, emergency physicians should always consider this possibility when assessing patients who have had an abrupt loss of lower limb sensibility and/or strength.

Conclusion

Spinal cord infarction is a rarity and and might differ in incidence, severity, prognosis, and recovery, doctors may find it difficult to diagnose them. There are still no clear treatment options for this very uncommon ailment.

Author Contributions

All authors contributed equally to the drafting of study.

Patient consent

IRB from the ethical committee taken as well as from the patient. This can be provided if asked.

REFERENCES

[1] Cadman C., Spinal cord infarct. Case study, Radiopaedia.org (Accessed October 10, 2024).

[2] Pigna F, Lana S, Bellini C, Bonfanti L, Creta M, Cervellin G. Spinal cord infarction. A case report and narrative review. Acta Biomed 2021;92(S1):e2021080. doi:10.23750/abm.v92iS1.8395.

[3] Patel S, Naidoo K, Thomas P. Spinal cord infarction: a rare cause of paraplegia. BMJ Case Rep 2014;2014:bcr2013202793. doi:10.1136/bcr-2013-202793.

[4] Castelló VR, Sánchez AS, Villalba EN, López AG, Parra P, Jorge FR, et al. Spinal cord infarction: aetiology, imaging findings, and prognostic factors in a series of 41 patients. Neurología (English Edition) 2023;38(6):391–8.

[5] Ke G, Liao H, Chen W. Clinical manifestations and magnetic resonance imaging features of spinal cord infarction. J Neuroradiol 2024;51(4):101158.

[6] Vargas MI, Gariani J, Sztajzel R, et al. Spinal cord ischemia: practical imaging tips, pearls and pitfalls. Am J Neuroradiol 2015;36:825–30.

[7] Novy J, Carruzzo A, Maeder P, et al. Spinal cord ischemia: clinical and imaging patterns, pathogenesis and outcomes in 27 patients. Arch Neurol 2006;63:1113–20.

[8] Cheng MY, Lyu RK, Chang YJ, et al. Spinal cord infarction in Chinese patients. Clinical features, risk factors, imaging and prognosis. Cerebrovasc Dis 2008;26:502–8.

[9] Shinoyama M, Takahashi T, Shimizu H, Tominaga T, Suzuki M. Spinal cord infarction demonstrated by diffusion-weighted magnetic resonance imaging. J Clin Neurosci 2005;12(4):466–8.

[10] Masson C, Pruvo JP, Meder JF, et al. Spinal cord infarction: clinical and magnetic resonance imaging findings and short term outcome. J Neurol Neurosurg Psychiatry 2004;75:1431–5.