Gastric carcinoma leading to metastatic spinal cord compression

Nida Fatima Daterdiwala[1], Hina Fatima Memon[2], Asra Erum[3], Asif Husain Osmani[4]

Abstract

Gastric cancer is described as a malignancy occurring in the region between the gastroesophageal junction and the pylorus. According to the histology, majority of gastric cancers are classified as adenocarcinomas. The prevalence of bone metastasis in the general population is 2-3%. Here, an unusual case of a 73-year-old male is discussed who presented on September 10, 2023, with symptoms of lower back pain and bowel and urinary incontinence. His MRI results showed mild indentation along with nerve impingement and hypertrophied ligamentum flavum at the level of L5/S1. Within D11 and D12 vertebral bodies, diffuse abnormal signals were appreciated predominantly along posterior corners. CT scan of the abdomen showed sessile hypodense area along the mucosa of the posterior wall of the gastric antrum. Histopathology further confirmed the diagnosis with the appearance of signet ring cells. He was managed with supportive care and palliative radiotherapy. The patient expired on the 28th day of being discharged.

Keywords: Stomach Neoplasm, Metastasis, Spinal Cord Compressions, Tumour.

DOI: https://doi.org/10.47391/JPMA.11281

Introduction

Gastric cancer is described as a malignancy appearing from the region between the gastroesophageal junction and the pylorus of the stomach.[1] Approximately 95% of gastric cancers are classified as adenocarcinomas based on histology.[2] Globally, it is the fourth most common malignancy and the third leading cause of cancer-related mortality among males and the fifth among females, with nearly 1,000,000 new patients being diagnosed each year.[3] Spinal cord compression due to bone metastasis is usually a result of breast, prostate and lung cancer[4] but is observed to be a rare finding in gastric adenocarcinomas with a prevalence of 2-3% in the general population.[5]

An unusual case of an elderly man is reported who presented with initial symptoms of chronic lower back pain and lower limb numbness secondary to suspected gastric adenocarcinoma based on clinical and radiological workup.

Case Report

A 73-year-old male with natural killer cell-mediated (NKCM) activity, presented in the emergency department of Ziauddin Hospital, Karachi, on September 10, 2023, with complains of lumbosacral pain, faecal and urinary incontinence for six weeks after surgical hernia repair and laparoscopic cholecystectomy that was performed eight weeks ago. Initially, the weakness involved only the right lower limb which eventually progressed to the left, accompanied by paraesthesia in both the limbs. Further history revealed that the patient was bed bound for nearly two weeks due to paraplegia.

On arrival, he seemed visibly anxious, displaying signs of restlessness and increased body tension. Upon general physical examination, he had normal vital parameters with no positive findings except conjunctival pallor. The patient had a Glasgow Coma Scale (GCS) score of 15/15, indicating full consciousness.[6] The abdomen was soft and non-tender on palpation. Gut sounds could be appreciated. On chest auscultation, normal vesicular breathing sounds were bilaterally heard, with equal air entry. S1 and S2 were audible with no added sounds. Motor examination revealed normal bulk, tone and power in the upper limbs. However, on examining the power of the lower limbs no muscle contraction or movement was observed which was graded as 0/5. There was total loss of sensation in the lower limbs. The cranial nerves were intact. Medical and family history were non-significant. There was no history of smoking or drug addiction. However, his sleep and appetite were greatly affected. Surgical history revealed hernia repair and laparoscopic cholecystectomy without any pre or post-operation complications. The patient belonged to a middle socioeconomic class.

[1,2]Final Year MBBS Student, Ziauddin University, Karachi, Pakistan; [3]Department of Histopathology, Ziauddin University, Karachi, Pakistan; [4]Department of Oncology, Ziauddin University, Karachi, Pakistan.
Correspondence: Nida Fatima Daterdiwala.
Email: Nidafati99@gmail.com
ORCID ID: 0000-0002-2724-4975

Submission complete: 28-11-2023 **1st Revision received:** 07-05-2024
Acceptance: 30-10-2024 **Last Revision received:** 29-10-2024

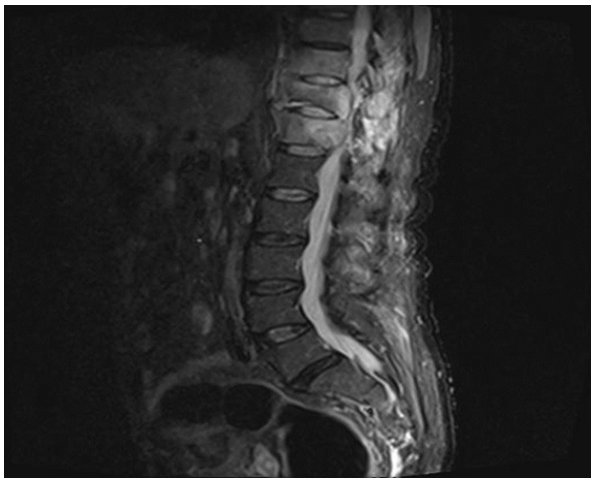

Figure-1a: A sagittal T2W MRI showing diffuse hyperintense abnormal signals within D11 and D12 vertebral bodies predominantly along posterior corners, extending into the posterior element.

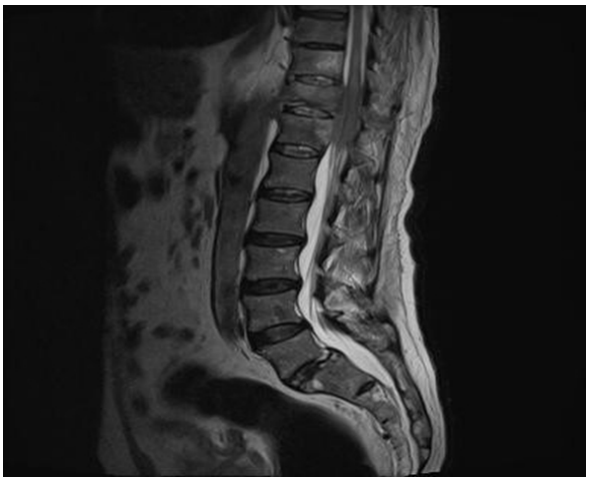

Figure-2b: A sagittal T2W MRI showing posterior disc bulge at L5/S1 level causing impingement over both exiting nerves.

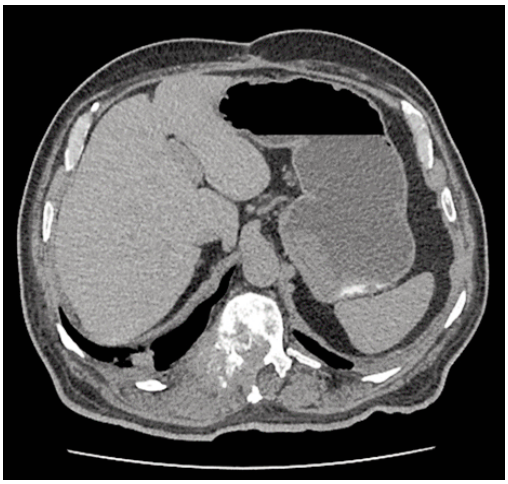

Figure-2: An axial view of the CT abdomen with contrast demonstrating destruction of D11 and D12 vertebrae involving the posterior element, along with a 37mm x 25mm sessile hypodense area covering the posterior wall of the antrum.

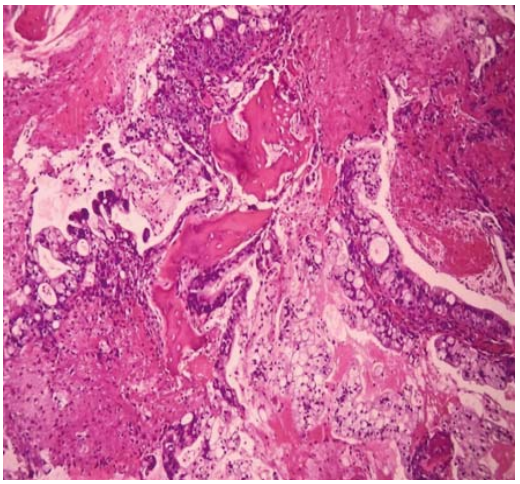

Figure-3a: H&E stain (4x) showing sections of bony fragments having malignant tumour cells arranged in sheets with cribiform spaces, fused glands and nests.

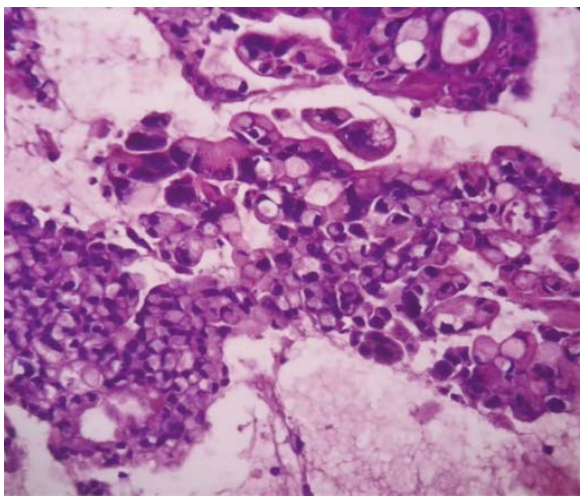

Figure-3b: H&E stain (40x) showing clusters of cells with signet ring morphology.

To find out the underlying cause, his workup was done. Complete blood picture showed Haemoglobin levels of 12.4g/dL (normal: 14-18g/dl in males) and total leucocyte count of 11,300 per microlitre (normal range: 4,000 to 11,000 per microlitre). Carcinoembryonic antigen (CEA) and C-reactive protein (CRP) levels were done which were 4.95ng/ml (normal range: smoker: < 5.0 ng/ml non-smoker:<3.0 ng/ml) and 42.6mg/l (normal: up to 5.0 mg/L), respectively. Prostate specific antigen, urea, creatinine, and electrolytes values were within normal limits.

Magnetic resonance imaging (MRI) lumbar spine suggested suspicion of metastatic disease. Within D11 and D12 vertebral bodies, diffuse abnormal signals were appreciated predominantly along posterior corners (Figure 1a). At the level of L5/S1, impingement over both

exiting nerves and narrowing of neural foramina were noted, along with hypertrophy of ligamentum flavum (Figure 1b). Facetal arthropathies were also seen at resting position of the lumbar spine.

Computed tomography (CT) scan of the chest and abdomen showed destructive changes of the vertebrae with right paravertebral soft tissue component, raising a high suspicion of metastatic disease. Sessile hypodense area along the mucosa of the posterior wall of gastric antrum was noted (Figure 2). Upper GI endoscopy was also planned. The patient, however, refused to undergo it.

Furthermore, a review of a CT guided bone biopsy revealed fragments of bone with inter-trabecular spaces showing a malignant neoplasm having a glandular configuration (Figure 3a). Individual cells had enlarged, hyperchromatic nuclei with irregular nuclear contour and focally prominent nucleoli. At places, clusters of cells with Signet ring morphology were seen (Figure 3b). Immunohistochemistry showed CK 7, CK 20, Villin positive and CDX 2 and Cadherin 17 focal positive in tumour cells. Therefore, a diagnosis of advanced bone metastasis from gastric adenocarcinoma (diffuse type) was made.

The patient was treated with Dexamethasone 4mg BD initially. He underwent five fractions (10 Gy dose per fraction) of palliative radiotherapy which failed to improve power in his limbs. He was discharged after eight days of admission on Rivaroxaban 10mg OD, factor Xa inhibitor, to prevent deep venous thrombosis, and Morphine, an opiate analgesic, 10mg PRN. His family was counselled about his poor prognosis and functional loss and was advised to provide supportive care. After 16 days of discharge from hospital, he developed bed sores and dysphagia for solids followed by liquids, therefore, air mattress and nasogastric tube feeding were advised. He ultimately expired on the 28th day.

Discussion

Nearly all of the gastric malignancies are gastric adenocarcinomas, but are highly diversified with respect to structure, multiplication pattern and cell differentiation. As mentioned in Lauren classification[7], there are mainly two types of such cancers: diffuse and intestinal. Diffuse cancers are inadequately differentiated and consist of isolated tumour cells with no gland formation. In contrast, intestinal type carcinomas, in most cases, contain adequately to moderately differentiated cells and form secretory structures.[8] Gastric carcinoma commonly spreads to lungs, breast, and prostate but it rarely metastasises to bone[4] with prevalence of 2-3%in general population.[5] Metastatic spinal cord compression (MSCC) can lead to signs and symptoms such as decreased power and numbness in the lower limbs and loss of bladder and anal control.[5] More than 80% of bone metastases in gastric malignancy are cytologically diagnosed as inadequately differentiated adenocarcinoma.[5] Neuropathy and mobility changes are important prognostic factors. It has been observed in previous studies that the patients who presented with intact neurological function and were locomotive before treatment continued to walk and have normal neurological function after treatment, while only 7% of those who presented with immobility and neuropathy improved after treatment.[5] Likewise, this patient could have had better prognosis and intact mobility if his disease had been detected and treated while he was able to move and did not have neuropathy.

As most of the time patients develop non-cancerous back pain, metastatic spinal cord compression (MSCC) is not determined and managed promptly.[4] According to a study in 2014, the average period from the identification of gastric malignancy to the recognition of a bone metastasis was 14.2 months in operated gastric cancer patients and 8.2 months in untreatable gastric malignancy patients.[9]

This patient's initial manifestations of back pain followed by encopresis, enuresis, and paraplegia makes it a unique case, suggesting skeletal involvement. Elderly people who present with back pain should be advised screening for malignancy before it worsens and cause neurological symptoms.

Conclusion

Back pain, when presented clinically, should be evaluated thoroughly through circumstantial history and comprehensive physical examination to eliminate any devastating condition like the one detected in this patient. Skeletal metastasis as a sequel of gastric malignancy, although rare, can be a conceivable cause of lumbar pain; therefore, it should not be disregarded. Deferred diagnosis and subsequent delayed treatment can lead to ominous prognosis. Moreover, awareness programmes should be organised in order to encourage individuals to get their screening done promptly before the condition exacerbates.

Consent: The consent of the guardian/wife was taken prior to the writing of the manuscript.

Acknowledgment: We sincerely thank clinical investigators Dr Azalfa Malik (Foundation University medical college), and Dr Aqsa Farrah (Dalian Medical University) for their assistance in this work online.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Funding disclosure: None to declare.

References

1. Kamble P, Gujar S, Pohekar S, Sharma R, Sakharkar S, Raut A, et al. Case Report on Gastric Carcinoma. J Pharm Res Int 2021;33:383-7. doi: 10.9734/jpri/2021/v33i57A34009.
2. Arak H, Teker F. A Gastric Adenocarcinoma Case Presenting with Hematuria. J Urol Ren Dis 2022;7:1267. doi: 10.29011/2575-7903.001267.
3. Pattanayak S. A Case Report of Bone Metastasis from Gastric Cancer. J Surg 2017;2017:137. doi: 10.29011/JSUR-137.000037
4. Kawahigashi T, Kawabe T, Iijima H, Igarashi Y, Suno Y, Takagi M, et al. Metastatic spinal cord compression by gastric cancer: a case report. Oxf Med Case Reports 2019;2019:OMZ093. doi: 10.1093/omcr/omz093
5. Sato S, Ishibashi Y, Kawasaki K, Yamazaki R, Hatao F, Morita Y, et al. A case of disseminated carcinomatosis of the bone marrow from gastric cancer developing rapidly after a gastrectomy. Surg Case Rep 2021;7:49. doi: 10.1186/s40792-021-01135-5
6. Teasdale G. The Glasgow Structured Approach to Assessment of the Glasgow Coma Scale. [Online] 2018 [Cited 2024 November 27]. Available from URL: https://www.glasgowcomascale.org/
7. Hu B, El Hajj N, Sittler S, Lammert N, Barnes R, Meloni-Ehrig A. Gastric cancer: Classification, histology and application of molecular pathology. J Gastrointest Oncol 2012;3:251-6. doi: 10.3978/j.issn.2078-6891.2012.021
8. Van Cutsem E, Sagaert X, Topal B, Haustermans K, Prenen H. Gastric cancer. Lancet 2016;388:2654-6. doi: 10.1016/S0140-6736(16)30354-3
9. Turkoz FP, Solak M, Kilickap S, Ulas A, Esbah O, Oksuzoglu B, et al. Bone metastasis from gastric cancer: the incidence, clinicopathological features, and influence on survival. J Gastric Cancer 2014;14:164-72. doi: 10.5230/jgc.2014.14.3.164.

AUTHORS' CONTRIBUTIONS:
NFD: Concept, literature search and design.
HFM: Providing key information, literature search and revision.
AE: Drafting, data analysis and critical revision.
AHO: Final approval and revision of the report.