Compressive myeloradiculopathy from bony metastasis as the initial presentation of poorly differentiated adenocarcinoma stomach – a case report

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CASE REPORT

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Abstract

Carcinoma of the stomach rarely disseminates to bone. We report a case of compressive myeloradiculopathy from extensive metastases to the spine, which on evaluation originated from adenocarcinoma of the stomach. Magnetic resonance imaging of the spine showed osteolytic and osteosclerotic metastases. Gastrointestinal endoscopy revealed ulcerative growth in the stomach that on biopsy showed poorly differentiated adenocarcinoma. This case is unique in that the initial presentation of gastric cancer itself was bony metastases without any gastrointestinal symptoms or liver involvement. Moreover, metastases were osteosclerotic as well, which is against the general belief that gastric cancer produces only osteolytic secondaries.

Key Words

Gastric cancer; adenocarcinoma; bone metastases; osteosclerotic; alkaline phosphatase.

Implications for Practice:

Bone metastases in gastric cancer are extremely rare and when present are likely osteolytic. In this case compressive myelopathy from extensive osteosclerotic and osteoltyic bone metastasis was the initial presentation of the patient. This case indicates that although rare, gastric cancer also needs to be considered in the differential diagnosis of primary tumours presenting with bone secondaries, and that osteosclerotic lesions may also be seen in these cases.

Background

Bony metastases are common in cancers of the lung, breast and prostate. Secondaries to bone from gastric cancer is very rare and have been reported infrequently in literature.[1-3] Asymptomatic gastric cancer with an initial presentation as bony metastases is even rarer.[4] Haematogenous dissemination to the vertebrae is thought to occur through lymphatic channels.[5] Bony metastases from gastric cancer are frequently osteolytic or mixed osteolytic-osteosclerotic.[6] Serum alkaline phosphatase levels are elevated in such cases. Previous reports of bone metastases from gastric cancer highlight that the liver tends to be spared in such cases.[7]

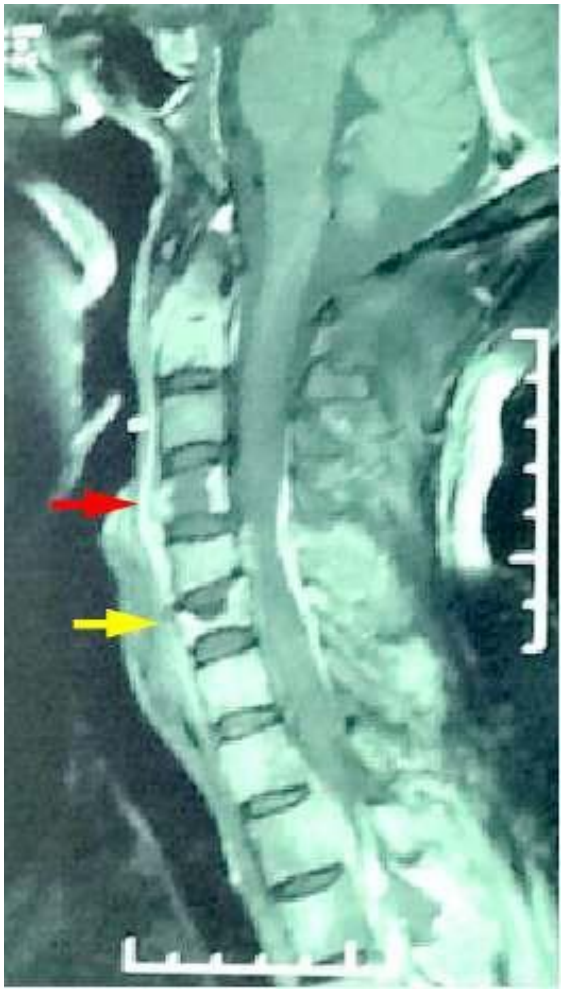
Case details

A 35-year-old male smoker and reformed alcoholic presented with complaints of shooting pain radiating from the neck to the left upper limb and low backache with radiation to right lower limb over a two-month period. A month later, the patient developed weakness in his left upper limb. The limb was hypotonic with predominantly proximal weakness. Two weeks later he developed weakness in the right lower limb which was predominantly proximal. There was marked wasting of both distal and proximal muscles in both the left upper limb and right lower limb. On detailed neurological evaluation it was found that weakness was asymmetric and involved all four limbs to varying degrees of severity. Except for an exaggerated biceps jerk on the right side and an extensor plantar on the left side, all superficial and deep tendon reflexes were absent. Pain, touch and vibration sensations were absent up to umbilicus and also to the clavicle in the right upper limb.

There was diffuse tenderness over the cervical and lumbar vertebrae. A clinical diagnosis of compressive myeloradiculopathy at cervical and lumbar levels was made.

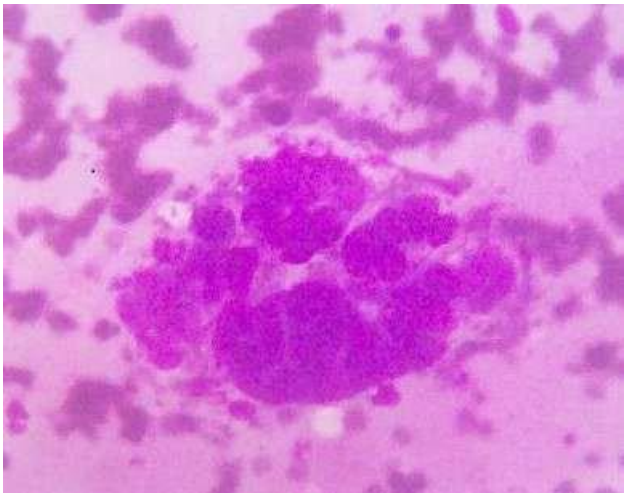
Initial investigations showed anaemia with an erythrocyte sedimentation rate of 130mm/hr. Serum alkaline phosphatase was elevated (369 IU/L). Chest X-ray was normal. A magnetic resonance imaging (MRI) of the spine revealed collapse of the C5 and C6 vertebrae, with soft tissue swelling in the same region (Figure 1). There was also collapse of the T8, T11 and L2 vertebrae, altered signal intensity in the anterior paraspinal soft tissue region, and indentation of anterior thecal sac at multiple levels. Hyperintensity was noted within the cord, involving levels T2 – L4, suggestive of cord oedema.

Figure 1: MRI cervical spine showing destruction of C4 (red arrow) and C6 (yellow arrow) vertebrae with adjacent paraspinal soft tissue mass



A fine-needle aspiration cytology from the soft tissue mass in the cervical region showed metastatic carcinoma (Figure 2). A contrast enhanced CT scan of the thorax demonstrated multiple lytic and blastic lesions involving the vertebrae, scapulae and ribs. In view of extensive bony lesions and anaemia, a bone marrow aspiration and biopsy was performed which revealed metastatic mucin secreting adenocarcinoma. Contrast enhanced CT scan of the abdomen showed circumferential wall thickening of the fundus and proximal body of the stomach with luminal narrowing and perigastric lymph nodes. The liver was normal and there was no evident abnormality in the prostate. Following this an upper gastrointestinal endoscopy was done which revealed semi-circumferential ulcero-proliferative growth in the fundus of the stomach up to the proximal body along the greater curvature. Multiple biopsies from this growth showed poorly differentiated adenocarcinoma of stomach. The patient was referred to a regional cancer centre for palliative care.

Figure 2: Fine needle aspiration cytology from the cervical paraspinal mass showing metastatic carcinoma (Leishman stain, x400).



In this case, the extensive bony metastases were the initial feature of the gastric cancer, which was otherwise asymptomatic for the primary tumour. Such presentations of gastric cancer have been very rarely reported in the literature. In addition, osteosclerotic secondaries which are typically described with prostatic cancer and very rarely reported with gastric cancer, were present in this patient. Presence of such osteosclerotic lesions could easily misguide and delay diagnosis of a primary tumour if gastric cancer is not considered in the differential diagnoses.

This case demonstrates a unique presentation of carcinoma stomach where the first manifestation of disease was due to extensive osteoblastic and lytic bony metastases. Moreover, these metastases occurred prior to metastasis to liver. Though uncommon, malignancy of stomach needs to be kept in mind in patients presenting with bony metastases.

Discussion

Gastric cancer is the third most common malignancy of the gastrointestinal tract worldwide, with the highest incidence found in Japan.[8] It has an overall five-year survival rate estimated to be approximately 25 per cent in spite of advances in surgical and staging techniques.[9] The common manifestations of gastric cancer include epigastric pain, early satiety, vomiting and constitutional symptoms.[10] More than 90 per cent of gastric cancers are adenocarcinomas.

Cancers of the prostate, breast and lung are commonly associated with bone metastasis, however metastasis to bone is quite rare in gastric cancer.[2] A study by Nisidoi (1987) had reported the incidence of skeletal metastasis from stomach cancer to be 13.4 per cent based on autopsies.[11] Yoshikawa and Kitaoka (1983) found that this incidence was 1.2 per cent in patients followed up after surgery for gastric cancer.[12] Recurrence of gastric cancer in the form of bone metastasis is also known, though only 10 such cases have been reported in the English literature.[13] Bone metastasis as the initial manifestation of carcinoma stomach is even rarer and has been reported only infrequently in the literature.[4] Mohandas et al. (1993) reported four cases of gastric cancer that presented with bone pain as the initial symptom.[14] Further evaluation of these cases revealed poorly differentiated adenocarcinoma of stomach. Furthermore only eight cases of solitary bony metastasis as the first sign of asymptomatic gastric cancer have been reported in literature.[15]

The most frequent site for distant spread in gastric carcinoma is the liver.[16] However, poorly differentiated adenocarcinomas spread less often to the liver and tend to involve the bones more frequently.[2] The location of the primary tumour has also been implicated in development of bone metastasis. Cancers of the body of the stomach and those with extensive local lymph node involvement are more likely to spread to the bones.[2]

It is interesting to note that carcinoma of the stomach with bone metastasis do not have liver involvement, as was the case with our patient. However, in such cases lymph node involvement seems very common. When bone metastasis occurs in carcinoma of the stomach, they are often osteolytic and less commonly mixed osteolytic-osteosclerotic. In the case report by Mohandas et al. (1993), out of the four gastric cancers that presented with bone metastasis, three were osteolytic and one was osteosclerotic.[14] Osteosclerotic metastasis are extremely rare with Saito et al. (2011) presenting the seventh such case in literature only recently.[17] Our patient had both osteolytic and osteosclerotic secondaries as evidenced by imaging and elevated alkaline phosphatase levels respectively. Several routes have been proposed for haematogenous spread of carcinoma of the stomach. The most important and common of these is via portal vein. Haematogenous dissemination is also possible through venous systems other than portal vein. Finally a small proportion of metastasis is believed to occur through lymphatic channels into the systemic circulation.[18,19] Since carcinoma stomach with bone metastasis spares the liver in most instances, dissemination via lymphatic channels is the best explanation for skeletal metastasis in carcinoma stomach.[20]

In a study conducted in Korea, the most frequent site of bone metastasis was the vertebrae (89 per cent), ribs (63 per cent), scapula (10 per cent), lower extremities (10 per cent) and upper extremities (5 per cent).[2] Our patient had extensive lesions involving vertebrae, ribs, scapulae and pelvic bones. The identification of bone metastasis in carcinoma stomach has prognostic utility. In the above-mentioned study, the median time to death from time of detection of bone metastasis was three months. Hence, presence of bone metastasis in patients with stomach cancers portends imminent death. In this study it was found that 47 per cent had only bone metastasis without any other distant spread. Only two of the patients (less than 10 per cent) had bone metastasis at the time of diagnosis of gastric cancer. In 18 patients bone metastasis was detected after a median period of nine months from the time of surgery for the primary tumour. Our patient had extensive bone metastases including vertebrae, ribs and scapula at presentation itself and diagnosis of gastric cancer was made during work up for the same. Our case is therefore one of the few instances in which bone metastasis is detected concurrently with the diagnosis of gastric cancer. Moreover, in our case, gastric cancer itself was almost asymptomatic and the patient presented due to symptoms from bone metastases.

A study by Kusumoto et al. (2006) described nine gastric cancer patients with bone metastasis and found that all of them had elevated serum alkaline phosphatase levels.[16] They concluded that an elevated alkaline phosphatase in a patient with gastric cancer may indicate bone metastasis and should prompt a detailed search for the same. Our patient also had elevated serum alkaline phosphatase levels that enabled us to direct our examination towards any bony lesions, thus aiding in the final diagnosis of gastric cancer.

Conclusion

Our case is one of the very few instances of bony metastasis as the first sign of asymptomatic gastric cancer. The

elevated alkaline phosphatase was a clue to possibility of bony metastasis. Our patient had both osteolytic and osteosclerotic lesions which is also quite uncommon. The presence of local nodal involvement, sparing of liver and poor differentiation on histology that has been reported with other similar gastric cancers were noted in our patient as well. Our case indicates that, despite bone being an uncommon site for metastasis from gastric cancer, it is worthwhile to consider gastric cancer in patients who present with bone pain and/or neurologic deficits and an elevated alkaline phosphatase. This case also emphasises that gastric cancer needs to be considered in the differential diagnoses of any unknown primary tumour presenting with osteosclerotic secondaries.

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PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

PATIENT CONSENT

The authors, Basheer A, Daniel J and Padhi S, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).

3. This submission is compliant with the requirements of local research ethics committees.