

## Osteoblastic metastasis from signet ring cell gastric cancer in a young male

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### ABSTRACT

Bone metastasis is common in patients with lung, prostate, and breast cancers but it isn't common in stomach cancer. Gastric carcinoma infrequently metastasizes to the bone and rarely in an osteoblastic form. Herein we presented a rare case of signet ring cell gastric adenocarcinoma in early stage with osteoblastic metastasis. To our knowledge our case was the youngest signet cell gastric cancer patient with osteoblastic bone metastasis reported in literature.

**Keywords:** Signet ring cell gastric carcinoma, osteoblastic metastasis, young

To the Editor,

Bone metastasis is common in patients with lung, prostate, and breast cancers but not in those with stomach cancer. Gastric carcinoma infrequently metastasizes to the bone and rarely in an osteoblastic form. Distant metastasis is also rarely reported in early gastric cancers (1,2).

A 21-year-old man was referred to our outpatient clinic with weight loss, widespread body pain, and fatigue. Upon first admission to our outpatient clinic, his bone pain was mild and was dramatically improved with low doses of acetaminophen. On physical examination, he had no abnormal signs apart from some discomfort when he was said to move around the examination couch. A laboratory examination revealed a sedimentation rate of 82 mm/hour, a hemoglobin level of 9.78 mg/dL, hematocrit level of 30.2%, and a platelet count of 210.000  $\mu$ L. The patient's serum calcium level was 7.8 mg/dL (normal range, 8.5-10.5) and his alkaline phosphatase level was 2204 IU/L (35-125). Simple radiographs of the sacrum revealed mottled osteoblastic changes. A whole body bone scan with technetium 99m showed increased uptake in areas of the axial skeleton, especially in the proximal parts of limbs. Without kidney involvement, the scan manifested a

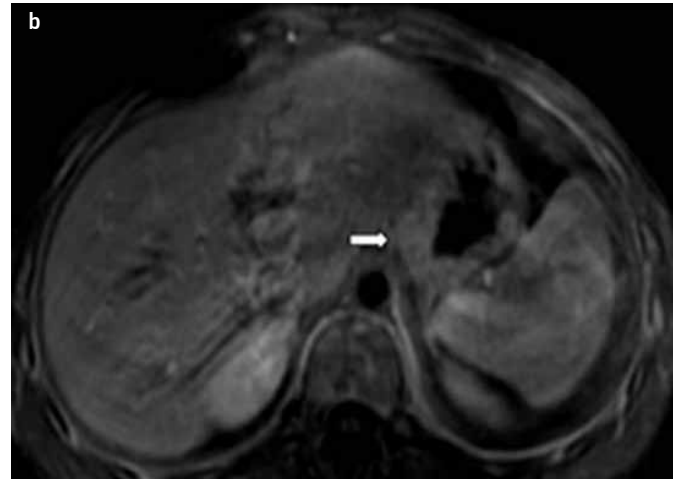


**Figure 1.** Superscan pattern in the bone scintigraphy: increased accumulation of the radiopharmaceutical agent diffusely throughout the skeleton, with minimal activity in the soft tissues and kidneys.

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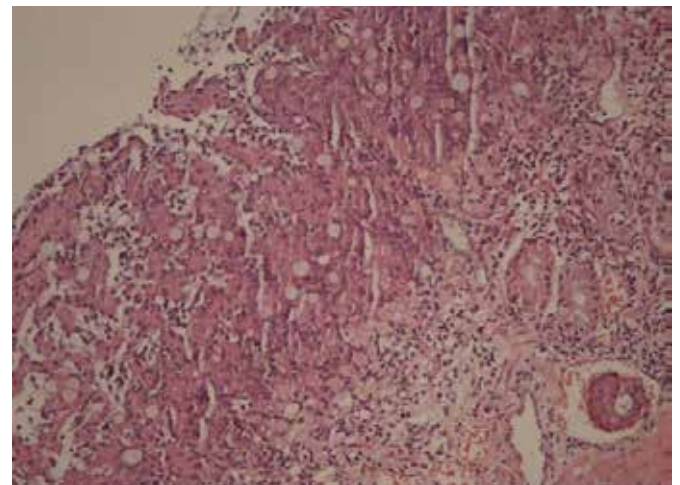
**Figure 2. a, b.** T2A (a) and fat-suppressed contrast-enhanced T1A sequences: suspicious thickening of the gastric wall is observed without the appearance of a mass (white arrow) (b).



**Figure 3.** Endoscopic image showing the small flat erosions seen at the minor curvature in the antrum near the incisura angularis.

typical superscan pattern that suggested bone metastasis of a primary malignant disease (Figure 1). Contrast-enhanced CT (computed tomography) revealed increased density in vertebral and pelvic bone structures. The patient's upper abdominal MRI (magnetic resonance imaging) showed only minimal diffuse thickening of the stomach (Figure 2).

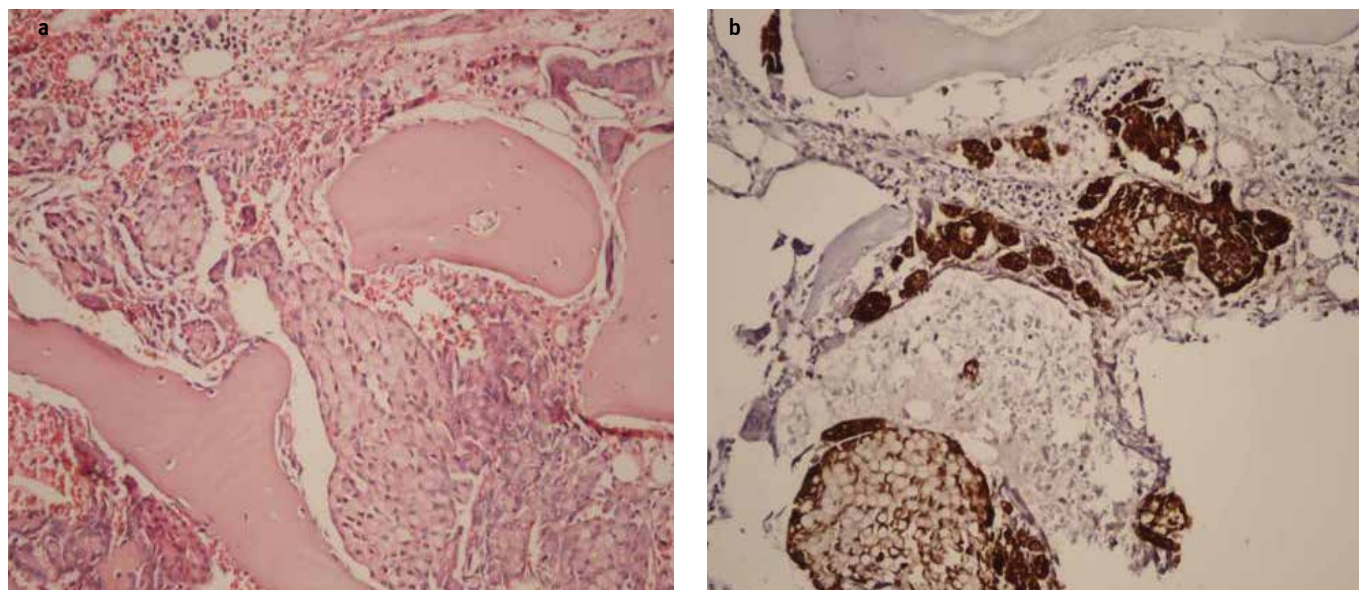
Since the patient's fecal occult blood test was positive and his CA 19-9 level was 2000 U/mL, a gastroscopy was performed. His gastroscopy showed no typical sign of gastric cancer except for flat erosions in the minor curvature in the antrum near the incisura angularis, which were biopsied. (Figure 3) An endoscopic biopsy revealed signet ring cell carcinoma (Figure 4). The patient's colonoscopy was unremarkable. A bone biopsy of the pelvis revealed that the patient had metastatic signet ring



**Figure 4.** Signet ring cells are seen on the surface together with cribriform structures and medium width eosinophilic cytoplasmic hyperchromatic nuclei carcinoma, which have lost mucin contents. Vascular invasion is also observed in the right bottom (H & Ex200).

cell adenocarcinoma, which was his final diagnosis (Figure 5a, b). He refused any specific oncologic treatment and received only supportive medical treatment. He was lost two months after the final diagnosis.

The incidence of bone metastasis from gastric cancer was found to be between 2 - 17.5% (3). More frequently, these osseous metastases are late complications occurring years after removal of the primary tumor. They are commonly osteolytic or less frequently a combination of osteolytic and osteosclerotic. Osteoblastic metastasis is an unusual feature of gastric cancer (4). To our knowledge, our case was the ninth case of an osteoblastic metastasis accompanying primary gastric cancer. All osteoblastic metastases with primary gastric cancers in literature are summarized in Table 1. Our case is the youngest metastatic signet ring cell gastric carcinoma in the literature.



**Figure 5. a, b.** Signet ring cells are seen through the trabeculae of the bone marrow tissue (H & E x200) **(a)**. Metastatic signet ring cell carcinoma showing immunoreactivity with PanCK (pan-cytokeratin antibody) is seen in the intertrabecular area in the bone tissue (x200) **(b)**.

**Table 1.** Osteoblastic metastases with primary gastric cancers

Authors	Number	Age	Gender	Stage	Other organ metastases
Our case	1	21	M	Early stage	-
Anagnostopoulos G et al. 2009 (5)	1	45	F	Early stage	-
Kang SH et al. 2008 (6)	1	71	M	Early stage	-
Chung YS et al. 2002 (1)	1	40	F	Late stage	Extensive lymph node and liver metastasis
Narváez JA et al. 1997 (7)	1	60	M	Late stage	-
Mohandas KM et al. 1993 (8)	1	64	M	Late stage	-
Uchida T et al. 1981 (9)	1	57	M	Late stage	-
Carstens SA et al. 1980 (10)	1	36	M	Late stage	-
Banerjee AK et al. 1977 (11)	1	50	M	Late stage	-

The prognosis for gastric carcinoma with osteoblastic bone metastasis is generally poor. The longest survival time of a patient with gastric cancer with osteoblastic metastasis has been reported as 18 months (5). The survival of all other patients with this condition has been reported to be a maximum of 4 months (6-7). We lost our patient just two months after the final diagnosis.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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