

A Rare Case of Metastatic Super Scan from Signet Ring Cell Adenocarcinoma of Stomach

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ABSTRACT

A super scan in scintigraphy is defined as intense symmetric radiotracer activity in the bones, increased bone: soft tissue uptake ratio and diminished renal parenchymal uptake. Carcinoma prostate, breast and lung are common malignancies known to cause 'metastatic' super scan, indicating disseminated skeletal metastases. Here we present a case of metastatic super scan on ^{99m}Tc-MDP bone scintigraphy in a poorly differentiated gastric adenocarcinoma with signet ring cell component arising from distal body and incisura of the stomach of a 37 years old lady who presented with loss of appetite and occasional vomiting.

Keywords: Super scan, Bone scan, Carcinoma, Stomach, Disseminated skeletal metastasis

INTRODUCTION

A super scan in scintigraphy is defined as intense symmetric radiotracer activity in the bones, increased bone: soft tissue uptake ratio and diminished renal parenchymal activity [1]. When the metastatic disease diffusely involves bones, it causes excessive skeletal radioisotope uptake in ^{99m}Tc bone scan. There is little or no activity in the soft tissues or urinary tract. Prostate cancer is the most common cause of 'metastatic' super scan. Other malignancies known to be associated with super scan are breast and lung cancer [2]. Here we present a case of metastatic super scan on ^{99m}Tc-MDP bone scintigraphy in a poorly differentiated gastric adenocarcinoma with signet ring cell component arising from distal body and incisura of the stomach of a 37 years old lady who presented with loss of appetite and occasional vomiting.

CASE REPORT

A 37 years old house wife from Bangladesh presented with unexplained loss of appetite and occasional vomiting for last 3 months. Endoscopy revealed an ulcerated lesion in the distal body and incisura of the stomach. An asymmetrical circumferential wall thickening involving antro-pyloric region of stomach was detected in USG upper abdomen. Biopsy from distal stomach tumor diagnosed a poorly differentiated adenocarcinoma with

signet ring cell component. Immunohistochemistry done for cytokeratin (AE1/AE3) highlighted the invasive tumor cells (**Figure 1**). Her renal parameters were within normal limit (urea 15 mg/dl, creatinine 0.47 mg/dl).

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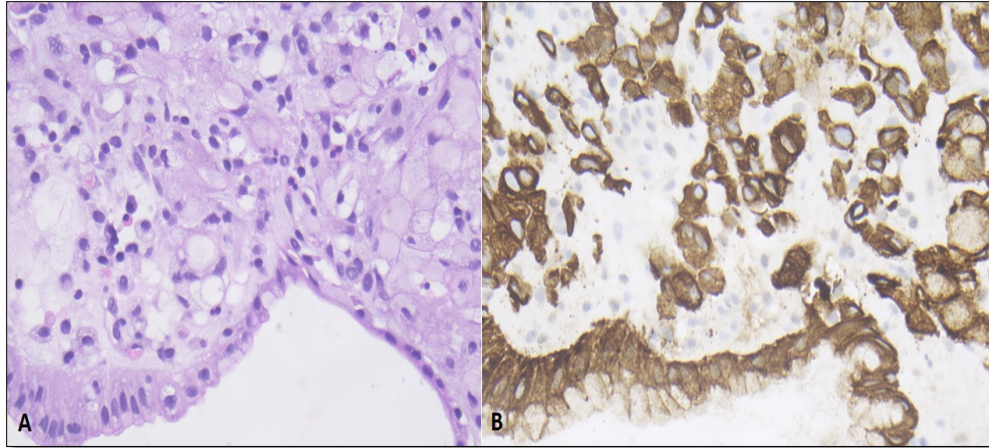


Figure 1. (A) Stomach biopsy showing signet ring cells in the lamina propria (H&E stain 400x). (B) signet ring cells highlighted by cytokeratin (AE1/AE3) stain (400x).

The patient was referred for ^{99m}Tc-MDP bone scintigraphy as a part of metastatic work up. Her bone scan revealed intense radiotracer uptake involving almost the entire axial and proximal appendicular skeleton with high bone to soft tissue radiotracer uptake ratio. The kidneys and urinary bladder were very faintly visualized. These findings were consistent with ‘metastatic super

scan’ (**Figure 2**). CT scan of thorax and whole abdomen done at the same time showed diffuse involvement of all visualized bones with mixed lytic sclerotic lesions consistent with bone metastases (**Figure 3A**). CT scan also showed bilateral enlarged ovaries with solid, cystic mass lesions consistent with Krukenbergs tumor. No lung or breast lesion was detected.



Figure 2. Bone scan shows high bone to soft tissue radiotracer uptake ratio. The kidneys and urinary bladder were very faintly visualized.

The patient was advised palliative chemotherapy. Review after four cycles of chemotherapy showed no significant

change of the primary lesion as well as metastatic diseases in follow up CT scan (**Figure 3B**).



Figure 3. Coronal reformatted images of CT scan of thorax and whole abdomen: (A) CT scan at the time of staging showing diffuse involvement of all visualized bones with mixed lytic sclerotic lesions consistent with bone metastases. (B) Review after four cycles of chemotherapy showing no significant change of the metastatic diseases.

DISCUSSION

Skeletal uptake of ^{99m}Tc MDP depends upon blood flow to the area and bone remodeling activity-in particular new bone formation. Intense activity in bone scintigraphy in diffuse metastatic disease can be explained by diffuse bone marrow involvement [1]. Less frequently, multiple metabolic diseases cause diffuse skeletal uptake of ^{99m}Tc MDP simulating 'super scan'. Hyperparathyroidism, renal osteodystrophy, hyperthyroidism and hypervitaminosis D are associated with scintigraphic super scan. Metabolic super scan is more uniform in appearance than metastatic super scan, frequently involving distal appendicular skeleton and causes intense calvarial uptake that is disproportionate to that in the remainder of the skeleton [3]. The exact mechanism of 'metabolic' super scan is unknown. Gastric cancer frequently metastasizes to liver and peritoneum. Overall incidence of bone metastasis from gastric cancer is found to be around 10 to 12 percent [4,5]. Bone metastasis is more frequently seen in cancer at cardia than distal end of stomach. Signet ring cell adenocarcinoma has a predilection to be associated with bone metastasis [4]. However, skeletal metastasis from gastric adenocarcinoma is most commonly osteoclastic in nature. A combination of osteolytic and osteosclerotic lesions are seen less frequently. Osteoblastic metastasis is an unusual feature of gastric cancer and infrequently reported in literature [6]. The osteoblastic metastasis in gastric cancer usually is seen in advance stage of disease and associated

with poor prognosis. In gastric cancer patients, significantly better survival period was observed in patients with singular bone metastasis rather than multiple skeletal deposits [7].

CONCLUSION

Gastric adenocarcinoma which more frequently causes osteoclastic or mixed osteoclastic-osteosclerotic skeletal metastases may rarely produce disseminated osteoblastic metastasis. Diffuse osteoblastic metastases from gastric adenocarcinoma, especially signet ring cell adenocarcinoma from distal stomach can rarely cause 'metastatic' super scan.

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