Abstract. – The purpose of this case report is to increase the knowledge about bone metastatic pattern in gastric cancer. A 59-year-old man presented with headache three years after a total gastrectomy for signet-ring cell carcinoma. Head computed tomography and magnetic resonance imaging showed multiple osteolytic lesions of the cranial vault and base, consistent with metastatic or haematological disease. Bone scintigraphy confirmed areas of accumulation only in the skull. An extensive search didn’t show any other tumor. Bone biopsy revealed metastatic signet-ring cell carcinoma. In gastric cancer, bone metastases are generally associated with metastases in lymph nodes, liver, and lung, and have a higher frequency in the thoracolumbar spine. However, cranial bone metastases presenting with headache may be the only manifestation of gastric cancer recurrence.

Key Words:
Computed tomography, Gastric carcinoma, Magnetic resonance imaging, Osteolytic metastasis.

Introduction

When patients with prostate cancer are excluded, and regardless of treatment, bone metastases have been reported to be the first sign of “recurrence” in 1.3% of the patients with a known primary solid malignancy, and 1.6% of patients with gastric cancer. Gastric cancer most frequently metastasizes to lymph nodes, liver, and lung, while bone metastases are uncommon and account for only 1-11% of patients. Skeletal metastases are commonly multiple, and most frequently occur in the spine. The purpose of this case report is to increase the knowledge of the pattern of bone metastases from gastric cancer by reporting a patient in whom the only manifestation of signet-ring cell carcinoma recurrence had been headache and pain from osteolytic metastases of the skull.

Case Report

A 59-year-old man was admitted to our institution with a one-month history of therapy-resistant headache in the right frontal-temporal regions. Three years before, he had undergone esophagectomy with limited lymph node dissection because of a signet-ring cell carcinoma of the anterior wall of the stomach, with invasion of subserous coat (stage: G2-T1-N2-M0). Postoperatively, four chemotherapy courses were administered with apparent complete remission. At admission, physical examination did not show relevant clinical signs. Laboratory disclosed only increased serum levels of alkaline-phosphatase (243 U/L) and CEA (15.5 ng/mL). Computed tomography (CT) scans, and magnetic resonance (MR) imaging (Figure 1) showed osteolytic lesions in the right frontal and parietal cranial vault, and in the sphenoid bone, consistent with metastatic or haematological disease. Bone marrow biopsy was negative. Thyroid ultrasound showed two hypoechogenic nodules, without evidence of malignancy at both scintigraphy and biopsy. CT scan of the chest, and abdomen ruled out other tumors, as well as gastrointestinal endoscopy. Biopsy of the right frontal bone lesion showed signet-ring cells (Figure 2), suggesting metastasis of the primitive gastric cancer. The patient underwent chemotherapy, and frontal metastasis resection.
Cranial osteolytic metastases as the only recurrence of gastric carcinoma

Figure 1. Computed tomography (CT) scans (A-D), and magnetic resonance imaging (MRI) (E). Unenhanced axial CT images show well defined osteolytic lesions in the right frontal (arrow in A), and parietal (arrow in C) cranial vault, as well as a subtle osteolytic lesion in the right sphenoid bone (arrowhead in D). Contrast-enhanced axial CT image shows subtle dural contrast-enhancement of the lesion in the right frontal region (arrow in B). Unenhanced T1-weighted sagittal MRI image (E) shows the parietal cranial vault lesion (arrow), and better depicts the lesion in the right sphenoid bone (arrow); both lesions appear as low signal intensity areas when compared with normal high signal intensity bone marrow in the remaining cranial vault and base (points).

Discussion

In gastric cancer, haematogenous metastases have been reported in advanced disease, but also in early gastric cancer. Bone metastases from gastric carcinoma are uncommon, accounting for 2 to 17.5%. From a group of 48 patients with gastric cancer and bone metastases, bone metastases alone have been found in 58% of patients, and occurred most frequently in stage III and IV tumors. The most frequent primary tumor was poorly differentiated type (40%), followed by moderately differentiated (27%), signet-ring cell (17%), well differentiated (8%), and other types (8%). The most frequent site of metastases was the spine, with a significant percentage of cases involving the thoracolumbar vertebrae nearer to the stomach.

Figure 2. Histology. A, Bony tissue with infiltrative neoplastic cells with wide cytoplasm and hyperchromic nucleus. High osteolysis with fragments of osseous matrix. (EE 10 x.) B, At higher magnification: cells with peripheral nuclei (arrow). Intensely coloured cytoplasm indicates presence of mucus. (PAS 40 x.)
consistent with other data of the literature. Given the few reports available, mechanisms of bone metastases in gastric cancer are still not known with certainty. However, the rich supply of blood capillaries in the gastric mucosa may contribute to the early spread of cancer to liver and bones. The preferred involvement of the thoraco-lumbar vertebrae nearest to the stomach indicates that the main route is reaching the bone may be haematogenous through Batson’s vertebral plexus. The mean interval between surgery and diagnosis of bone metastases has been reported to be 14 months. However, late bone recurrence has been reported.

Bone metastases from gastric cancer are often associated with significant and rapid morbidity, possibly due to hematologic disorders including disseminated intravascular coagulation and/or microangiopathic haemolytic anaemia, or spinal cord compression. The prognosis is uniformly poor because of resistance to any treatment. The mean interval between diagnosis of skeletal metastasis and death has been reported to be 60 days.

Radiographically, bone metastases from gastric cancer are generally of the osteolytic type, and diffuse or mottled osteoblastic lesions have been described as an unusual feature of the tumour. Diffuse or mottled osteoblastic lesions have been described as an unusual feature of the tumour. The mean interval between surgery and diagnosis of bone metastases has been reported to be 14 months. The mean interval between diagnosis of skeletal metastasis and death has been reported to be 60 days.

In conclusion, the unusual features of the case reported herein include bone metastases as the only recurrence from signet-ring cell carcinoma, absence of visceral metastases, and skull involvement. These confirm that skeletal metastases from gastric cancer have several distinctive patterns and features. A better knowledge of the metastatic pattern of gastric cancer helps patients’ diagnosis, treatment strategy, and method of follow-up.

References


