Management of a Solitary Bone Metastasis to the Tibia from Colorectal Cancer

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Key Words

Solitary bone metastasis · Tibia · Colorectal cancer · Chemotherapy · Radiotherapy

Abstract

The onset of osseous metastases during the course of colorectal cancer is not common. When they appear they are usually combined with visceral metastases to the liver, lungs and brain. In our report we refer to the case of a 78-year-old patient who presented a solitary bone metastasis from rectal carcinoma in the middle of his right tibia. A year before he had been operated for a Dukes stage B1 adenocarcinoma of the rectum. The rest of the check was negative for other metastases. He received external radiotherapy and capecitabine with bisphosphonates as palliative treatment. 19 months after the original diagnosis of bone metastasis the patient has stable disease.

Introduction

The onset of osseous metastases during the course of colorectal cancer is not common. When they appear they are usually combined with visceral metastases to the liver, lungs and brain. In our report we refer to the case of a 78-year-old patient who presented a solitary bone metastasis from rectal carcinoma in the middle of his right tibia. A year before he had been operated for a Dukes stage B1 adenocarcinoma of the rectum. The rest of the check was negative for other metastases.

Case Report

A 77-year-old man presented in April 2006 with a 6-month history of change in bowel habits and loss of total 8 kg in that time. Rectal digital examination revealed a tumor of the lower rectum. An abdomino-perineal excision was performed and pathological examination revealed a Dukes B1

adenocarcinoma with complete excision. The patient did not receive adjuvant chemotherapy or radiotherapy. CEA marker before surgery was 5.8 ng/ml. A chest/abdominal/pelvic CT scan in 04/2006 did not reveal any distant metastasis and the patient did not report any other symptoms. After surgical treatment the patient was on regular follow-up appointments every 3 months.

After about 1 year of being completely asymptomatic, in May 2007 the patient presented with a painful enlargement in his right tibia. On clinical examination there was a palpable, tender lesion in the middle of his right tibia measuring 8 × 4 cm. The patient did not complain for any other symptoms and the rest of the clinical examination was unremarkable. A 99mTc-MDP bone scintigram was performed showing abnormal uptake in the right tibia, revealing an osseous solitary metastasis ([fig. 1](#)). In plain radiography a single osteolytic lesion could be seen in the diaphyses of the right tibia covering almost all the diameter of the bone in this site ([fig. 2](#)). The patient underwent biopsy on his right tibia that showed bone metastasis from a rectal adenocarcinoma grade II. A new chest/abdominal/pelvic CT scan in 05/2006 revealed neither visceral metastases nor local recurrence. CEA marker was now 172.2 ng/ml.

In June 2007 external beam irradiation was given to his right tibia using a 2-field technique delivering 30 Gy dose in 10 daily fractions using a Co⁶⁰ unit, managing to relieve the patient's symptoms. In 11/2007 due to clinical progression of the tumor with pain and enlargement the patient received another fraction of radiotherapy. Again the complete CT scan check was negative for other metastases. The patient received palliative chemotherapy with capecitabine 850 mg/m² bid d1–14, zoledronic acid 4 mg q3w which he tolerated well with no significant side effects. He remains in partial remission with repeated CT scans every 3 months showing no new lesions. The lesion in his right tibia remains visible in plain X-ray and continues to show uptake in the bone scan 6 months after commencing chemotherapy. His performance status is 2 with no pain and without the need of painkillers. The CEA level dropped back to normal.

Discussion

Death from colorectal cancer is usually attributed to progression of the disease with recurrence and metastases. Skeletal metastases in primary colorectal cancer are an uncommon event. The incidence of bone metastasis is reported in the English literature to be between 4.7 and 10.9% in clinical cases and up to 23.7% in autopsy cases [1]. In the majority of cases they are associated with liver or lung cancer. Solitary skeletal metastases from a primary colonic carcinoma are a rare event, with a very low incidence of 1.1% in a retrospective review from Kanthan et al. [2]. In our case the site of the osseous metastasis is also rare, with only 5 cases reported in the literature previously, one from Decker and Fash [3], one from Creedon [4], and 3 from Kanthan et al. [2].

There is a difference in the frequency of bone metastases between colon and rectal cancer. As Masaru et al. [1] have demonstrated in their autopsy series, rectum cancers are more frequently associated with bone metastases than other portions of the colon. Also from the various histological types, signet ring cell carcinoma showed a high incidence of bone metastasis [1, 5, 6].

The most common site of osseous metastases is the vertebral, pelvis and the sacrum region. Osseous metastases in these sites are blood-borne through veins, and the paravertebral venous plexus of Batson is considered to be responsible [7]. The direct spread of prostatic, mammary, and gastrointestinal carcinoma to the vertebral venous plexus of Batson explains the high frequency of vertebral bony metastases in these primary tumors. The communications between the spinal veins in the lumbar region with the iliofemoral venous system may indicate that colonic and rectal neoplasms as well as vesical tumors seed to the lower extremities in a retrograde fashion [8].

Disease-free survival from the time of diagnosis to the onset of skeletal metastases ranged from 10 to 5,309 days according to Kanthan et al. [2]. They also concluded that 38% with bone only vs. 16% with bone and visceral metastasis were alive at 5 years

follow-up, although no statistical difference was found in the 10-year survival rate between the two groups. Also Nozue et al. [6] reported a median interval of 16.5 months from the initial diagnosis and operation to the onset of osseous metastases (range 0–108 months). The 1-year survival rate was 20% and the patients with solitary osseous metastasis (2 patients) survived more than 1 year.

For the early detection of osseous metastases the most effective method is considered to be bone scan. In plain radiography the lesions may be osteolytic or osteoblastic (less common). Talbot et al. [9] found that patients with symptomatic bone metastases were diagnosed a median of 21 months after initial surgical excision of the primary tumor. Our case report describes the detection of a solitary metastatic bone disease 12 months after the patient was initially diagnosed and total surgical excision of the primary tumor was performed.

Although solitary bone metastases from colorectal cancer are rare, the evidence from the literature shows that we should consider osseous metastasis as a cause of bone pain in patients with colorectal cancer, even in the absence of visceral metastases. These patients, as has previously been reported, have a better prognosis than patients with multiple bone metastasis or/and visceral metastasis and palliative chemotherapy and radiotherapy should be offered to them if they are eligible.

Fig. 1. ⁹⁹Tc-MDP bone scintigram showing abnormal uptake in the right tibia.

Fig. 2. In plain radiography a single osteolytic lesion could be seen in the diaphyses of the right tibia.

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