CASE REPORT

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Foot metastasis as a first clinical manifestation of rectal carcinoma

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Abstract: The incidence of colorectal carcinoma in the European population is high. The present paper describes the case of a farmer whose first symptom of rectal carcinoma was a metastatic tumour to the foot bones. Histopathological examinations of the tumour showed the presence of muciparous tubular adenocarcinoma. The patient underwent CT of the right foot, gastro- and rectoscopy, and scintigraphy of the whole body, The rectoscopy revealed the presence of rectal carcinoma. Despite rectal resection and amputation of the right lower limb, the patient died due to massive pulmonary embolism.

Key words: colorectal carcinoma, bone metastasis

INTRODUCTION

Colorectal adenocarcinoma continues to be a common neoplasm among the inhabitants of Western countries. Primary carcinomas of the gastrointestinal tract rarely present with osseous metastases. The first case of a bone metastasis from rectal carcinoma is attributed to Curling, who in 1870 described a metastasis to the radius [1]. Colorectal carcinoma metastases are spread by blood and/or the lymphatic route, and are carcinomas most commonly metastasized to the liver and lungs, less frequently to the brain. Metastases to the skin, muscles and bones without hepatic involvement are extremely rare [2]. There are no reports describing bone metastases preceding the detection of colorectal cancer. The metatarsus is a rare location of tumour lesions and 20% of such tumours are neoplastic [3]. Single cases of metastases at this location from lung and prostatic carcinomas have been reported [4, 5, 6]. However, there are no desriptions available of foot bone metastases in patients with colorectal cancer. Moreover, there are no reports describing bone metastases from colorectal cancers which were asymptomatic for a year.

We present the case of a farmer whose first manifestation of rectal cancinoma was a foot bone metastatic tumour. The 58-year-old farmer was admitted to the Clinic of Traumatic Surgery due to a tumour of the dorsum of the right foot, which increased over a period of two months, accompanied by oedema and pain (Fig. 1).

The lesion occurred 12 months earlier. For a year the patient was treated in the Orthopaedic and Surgical Outpatient Clinic of the regional hospital. Unfortunately, on the basis of clinical examination and right foot X-ray, the correct diagnosis was not established. The patient was referred to the Clinic of Traumatic Surgery where right foot X-ray and thin-needle biopsy of the foot were performed. The X-ray picture showed the presence of a tumour of the soft tissues and extensive osteolysis of the metatarsals. The histopathological

Figure 1 Photography of the farmer foot with tumor.

examination of biopsy specimens revealed metastatic tubular muciparous adenocarcinima. The patient underwent CT of the right foot which showed extensive osteolysis of the metatarsals and tarsus, and the presence of solid tissue mass with non-homogenous contrast enhancement. The MPR (multiplanar reformations), 3D (three-dimensional) and VRT (volume rendering technique) reconstructions carried out enabled determination of the size and extent of tumour infiltration (Fig. 2).

Additional examinations revealed normocytic anaemia, haemoglobin 11 g/dL, erythrocyte count 4.07 M/μL. The PSA (Prostate Specific Antigen) level was within reference values. Abdominal ultrasound showed prostatic enlargement and a single cyst in the left kidney. The chest X-ray was normal. Since the histopathological examination disclosed the metastatic lesion, probably from the alimentary tract, the patient underwent gastro- and rectoscopy. The gastroscopic findings were normal. Rectoscopy revealed slight haemorrhoidal varices, anal stenosis, and an exophytic lesion involving half of the intestinal circumference, ca. 17 cm from the anal line. Biopsy specimens were taken. The abdominal CT scan visualized the circular thickening of the walls of the rectum to 1.3 cm

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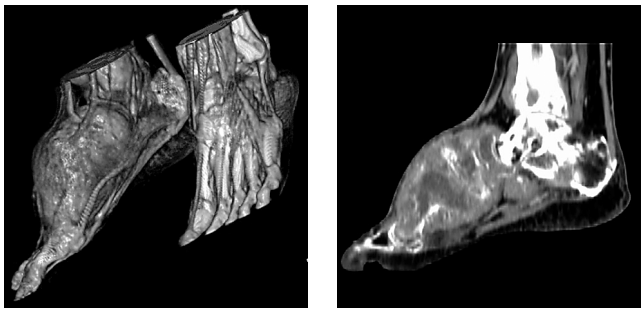

a b

Figure 2 (a) VRT (volume rendering techniques) – volumetric reconstruction with colour-coded imaging of the tissues. A big soft tissue tumour of the right foot bones compared to the normal left foot. (b) Sagittal MPR (multiplanar reformations) demonstrating foot bone destruction with a soft tissue tumour.

at a distance of ca. 6 cm and reaching the sphincter level. The uneven external contours of the changed fragment and tissue bands within the surrounding fatty tissue corresponded to the spread beyond the rectal wall and infiltration of the mesorectum. No hepatic focal lesions or enlarged periaortic lymph nodes were detected. CT scan of the head did not reveal any focal lesions, nor did the chest CT scan. The patient underwent bone scintigraphy of the whole body following the administration of MDP ^{99m} TC, which showed increased marker accumulation in the upper epiphysis of the right tibial bone, patella, lower part of the shank, and right foot bones. The findings of isotope examination suggested metastatic changes in the shank and bones of the right foot (Fig. 3).

The patient underwent excision of the rectal tumour via abdominal medial incision. During the procedure no nodular lesions were detected on the surface of the liver. The rectum was resected, and due to difficult anatomical conditions the artificial anus was exteriorized on the transverse colon. Histopathological examination of the excised part of the rectum confirmed the presence of tubular muciparous adenocarcinoma of the rectum (G2, pT3N1), with metastases to the adjacent lymph nodes (N2/8).

Due to metastatic bone lesions, the lower limb was amputated at the level of the thigh. On the 3rd postoperative day the patient was ambulated, on the 4th day he was able to move in a wheelchair. On the 6th day the patient developed neurological disturbances and increasing dyspnoea.

A repeated CT scan of the head showed slight anaemic foci. The patient died on the 9th postoperative day due to massive pulmonary embolism, despite earlier prophylactic antithrombotic treatment with low molecular weight heparin.

DISCUSSION

Colorectal carcinoma is one of the most common neoplasms worldwide [7] and mainly affects the elderly. The risk of developing this disease increases with age, but it is not unusual in young patients at the age of 40 or under. In older patients, the incidence of colon cancer was found to be stable while that of rectal cancer decreased by 11%. In younger patients the incidence of both these cancers increased by 17% and 75%, respectively [8]. Rectal cancer is usually of adenocarcinoma texture. In our patient, the diagnosis based on histopathological examinations was mucinous adenocarcinoma, that is, a subset of adenocarcinoma in which the cancer cells produce abundant extracellular mucin [9], and accounts for 10-20% of all colorectal cancers [10]. It is more common in younger patients in the proximal colon and advanced stage [11]. Furthermore, patients with mucinous colorectal adenocarcinoma have a poorer prognosis that those with ordinary adenocarcinoma [12]. Some authors have found a preponderance of mucinous adenocarcinoma in men [13]. The incidence of metastases in mucinous colorectal carcinoma is higher compared to non-mucinous carcinoma [14]. The bone metastases are detected

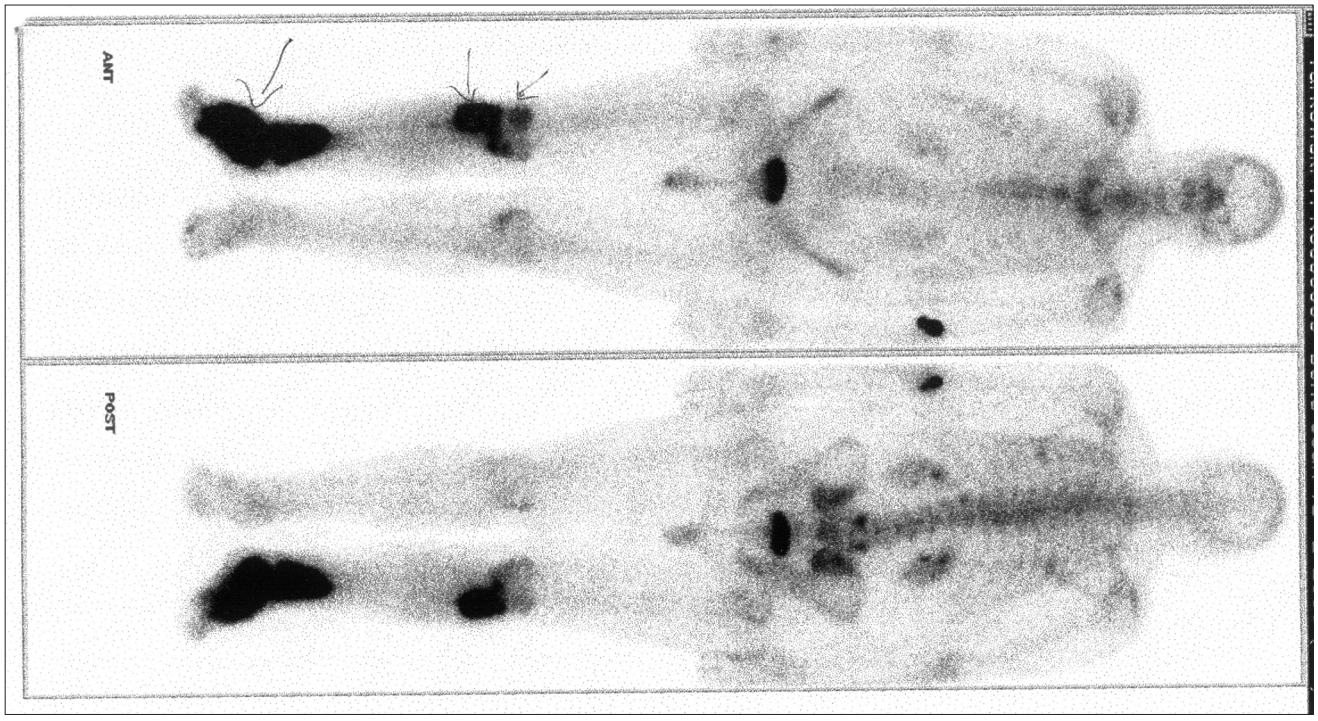

Figure 3 Bone scintigraphy of the whole body (metastasis to the foot bone and knee)

within 10-5,309 days after the diagnosis of colorectal cancer [15]. The symptom most frequently associated with rectal carcinoma is rectal bleeding. The blood is usually bright red and seen during a bowel movement. The patient may complain of increasing constipation or note a change in the size of the stool. Tenesmus is likely to be present if the tumour is large or has invaded the anal sphincter [16, 17].

In the case presented, the patient did not report any alimentary symptoms. The first manifestations were related to the foot bone metastasis, and for 12 months the patient had no other complaints. An early diagnosis of rectal carcinoma depends on routine examinations. The clinical examination should involve palpation of the rectum and anorectal canal. In each case in which lesions are detected, rectoscopy is indicated. The rectal carcinoma spreads via the blood or lymph, and may extensively infiltrate the adjacent organs, including the pelvic bones. Colorectal carcinomas most commonly metastasize to the liver and lungs, while bone metastases are observed in only 4-6% of patients with colorectal carcinoma. The main location of bone metastases is the lumbar and thoracic spine: 36-75% [18, 19].

In our patient, the rectal carcinoma metastasized to the foot bones. Bone metastases are most frequently observed in cancers of the prostate, lungs and breasts. The metastatic lesions of adenocarcinomas cause bone osteolysis [20, 21] and dramatically reduce the quality of life due to pain, bone fractures and bone marrow infiltration [22]. In the patient described, the bone osteolysis was detected during X-ray and CT examinations. The imaging diagnostic procedures of bone metastases include X-ray pictures, computed tomography and scintigraphy. The latter procedure is the optimal test to detect metastases before the occurrence of clinical signs and radiographically detectable lesions [23]. Scintigraphy is characterized by high sensitivity (up to 98%) of detection of metastatic lesions [7]. In our patient, the scintigraphy of the whole body showed the presence of metastatic lesions in the upper part of the right tibial epiphysis, patella, lower shank bone, and bones of the right foot, which allowed planning of the surgical procedure.

Another important element of diagnostic procedures in our patient was the bone biopsy for histopathological examination. On the basis of this examination, the diagnosis of mucinous adenocarcinoma was established. The prognosis in patients with bone metastases is poor. The mean survival rate depends on the type of carcinoma and is found to be about 2-3 years [7]. Effective treatment of rectal cancer requires the removal of the primary tumour and lymphatic route of spread. In metastatic cases, the tumour and all metastases should be resected [24].

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