Metastasis to the Thigh Skeletal Muscle from an Adenocarcinoma of the Duodenum

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Skeletal muscle is one of the most unusual metastatic sites for any malignancy. Duodenal cancer is extremely rare, and no cases of skeletal muscle metastasis from duodenal cancer have been reported. We report here in a case of metastasis to the skeletal muscle of the left thigh from duodenal cancer. Our patient was a 47-year-old man, exhibiting a painful mass in the posterior aspect of his left thigh over a 4 month period. An imaging study, and a biopsy, revealed a duodenal adenocarcinoma metastasize to the skeletal muscle. The patient refused chemotherapy and has followed up for 4 months. (Cancer Research and Treatment 2002;34:394-396)

**Key Words:** Duodenal neoplasm, Skeletal muscle, Metastasis

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**INTRODUCTION**

Skeletal muscle is an unusual metastatic site for any primary malignancy, even though the muscles make up a large part of the body, and receive an abundant blood supply (1). Tumor metastasize to skeletal muscle from primary malignant neoplasms have been reported in the lung, breast, colon, kidney, uterus, prostate, thyroid, ovary and hematopoietic organs (2,3). Primary duodenal carcinomas are rare, with the liver, lungs, bones and lymph nodes being usual distant metastasis sites (4). We were unable to find any reports in the literature on skeletal muscle metastasis from duodenal carcinomas (5). We report, herein, a case of metastasis to the skeletal muscle of the left thigh from an adenocarcinoma of the duodenum.

**CASE REPORT**

A 47-year-old man was admitted to our hospital in December 2001 due to the pain and a palpable mass on the posterior aspect of his left thigh, which had been present for 4 months. Magnetic resonance imaging (MRI) revealed a 2.0 cm×1.5 cm sized hyperintensified mass within the left medial posterior

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Fig. 1. MRI findings and histological appearance of the mass in the left adductor magnus muscle. (A) Axial T1-weighted and (B) Sagittal Gd enhanced T1-weighted images reveal hyperintensity mass within left adductor magnus muscle. (C) Histological appearance of the metastatic tumor in the skeletal muscle (H&E stain, ×200).
aspect of the adductor magnus muscle (Fig. 1A, 1B). The pathological examination of the specimen, obtained by incisional biopsy, showed a metastatic, poorly differentiated, adenocarcinoma in the skeletal muscle (Fig. 1C). The abnormal laboratory data on admission was: normochromic, normocytic anemia with a hemoglobin level of 7.7 g/dl. The carcinoembryonic antigen level and CA 19-9 were within normal limits. Gastro-duodenoscopy revealed a deep ulcerative-invasive lesion in a second portion of the duodenum, and a biopsy was performed (Fig. 2A). Computed tomography revealed a duodenal mass, and enlarged regional lymph nodes (Fig. 2B). The histopathological findings of the specimen, obtained by endoscopic biopsies, proved to be an adenocarcinoma identical to the specimen obtained from the thigh mass (Fig. 2C). Colonoscopy, and a bone scan, revealed no abnormal findings. From our findings, we concluded that the mass was an adenocarcinoma of duodenum metastasized to the regional lymph nodes and skeletal muscle. The patient refused chemotherapy and has followed up for 4 months.

**DISCUSSION**

Primary adenocarcinoma of the duodenum, excluding that of the ampulla of vater, occurs in only 0.35% of all gastrointestinal carcinomas, and in 33–45% of all small intestinal carcinomas (6–8). The incidence of duodenal carcinomas, detected at autopsy, is between 0.019 and 0.5% (9). Because of their rarity, most duodenal carcinomas are case reports, or a collection of several cases. The distant metastasis sites for duodenal carcinomas are the liver, lungs, bones and lymph nodes (4). Despite the fact skeletal muscle compromises nearly 50% of the total body mass, and receives an abundant blood supply, metastasis to the skeletal muscle is undoubtedly the most unusual site for any primary cancer. Tumor metastasize from primary malignant neoplasms have been reported in the lungs, breasts, colon, kidneys, uterus, prostate, thyroid, ovaries and hematopoietic organs (2,3). There have been no case reports of metastasis to skeletal muscle from the duodenum.

Some factors that might account for the infrequency of skeletal muscle metastases have been postulated. First, sporting skeletal muscles, which are constantly used for movement, might present a difficult site for the implantation and growth of metastatic cancer cells. During exercise, the capillaries dilate, increasing the amount of blood flow to the skeletal muscle to up to 800 times that in the resting state. Blood turbulence may also play a role in destroying circulating tumor cells (2). Second, there is a release of lactate into skeletal muscle, creating an acidic environmental, causing metastatic cancer cell proliferation (10). Third, protease inhibitors, located in the basement membrane, inhibit cell invasion to the tissue. Furthermore, connective tissues have been shown to possess diffusible proteases and other inhibitors, which may either block the enzyme-dependent processes of invasion, or the tumor development. Fourth, lymphocytes and/or natural killer cells, which play a major role in the inhibition of tumor metastasis, may be active in skeletal muscle. Despite the speculations, the precise mechanisms remain to be elucidated (2). The prognostic factors of a primary duodenal adenocarcinoma were stage and tumor location. In a recent review of 67 patients, Barnes, et
al. reported 5-year survival rates in Stages I and II of 100% and 52%, respectively, and 45% and 0% in stages III and IV, respectively (11). Lymph node invasion seems to be significant in the long-term survival rate (12). The prognoses associated with skeletal muscle metastases are considered to be poor, which is consistent with skeletal muscle metastases generally occurring as a feature of the systemic spread of the cancer. In fact, the majority of patients with skeletal muscle metastasis from all primary sites die within 1 year of diagnosis (12).

In conclusion, we described a case of skeletal muscle metastasis from a duodenal carcinoma. Although no cases have previously been reported on skeletal metastasis from the duodenum, the recent improvements in diagnostic imaging systems may facilitate a more frequent diagnosis of skeletal muscle metastasis.

REFERENCES