Skeletal Muscle Metastasis Secondary to Adenocarcinoma of Colon: A Case Report and Review of Literature

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Abstract

Introduction: Colon adenocarcinoma frequently metastasizes to the liver, regional lymph nodes, lungs and peritoneum. However, metastasis to the skeletal muscles is extremely rare manifestation of colon adenocarcinoma. To date, only few cases have been reported in the literature. Skeletal muscle metastasis from colon adenocarcinoma usually remains asymptomatic or manifest as swelling and are associated with dismal prognosis.

Case presentation: A 28 years old Saudi man known case of adenocarcinoma of transverse colon treated with extended hemi-colectomy and chemotherapy one year back, presented with abdominal wall swelling and right buttock swelling since 8 months. Physical examination revealed right gluteal mass of size 3×2 cm and abdominal wall mass of size 2×2 cm. Rest of examination was unremarkable. Computed tomography-Positron emission tomography (CT-PET) showed 3×2 cm lobulated mass arising from gluteus maximus muscle and another mass in rectus abdominis muscle. Incisional biopsy confirmed the metastatic adenocarcinoma of colon. Patient subsequently underwent palliative radiotherapy followed by systemic chemotherapy. At time of publication, patient was alive with progressive disease.

Conclusion: Skeletal muscles metastases are rare manifestation of adenocarcinoma of colon and searching for the primary focus in a patient with skeletal muscle metastasis, colon cancer should be considered as differential diagnosis.

Keywords: Colon adenocarcinoma; skeletal muscle metastasis; Rare

Introduction

Colon cancer is less common in the Saudi Arabia than in its counterpart Gulf Cooperation Council (GCC) States and in the West, but the incidence is increasing, making this disease he second most common malignancy after breast cancer, ranking first among men and third among women between 1994 and 2004 [1]. In 2004, 647 new cases of colon cancer were diagnosed in the Saudi Arabia with median age of 60 years in men (range, 19-105 years) and 58 years in women (range 16-100 years) [1]. Unfortunately most colon cancers present at metastatic stages in our region, and are not amenable to upfront curative surgery.

While the liver and lung are primary targets for distant metastasis from colon cancer, the metastasis to other distant sites is rarely found. Metastasis from colon cancer to skeletal muscles is rarest manifestation, only few related case reports have been published in literature so far [2], and the prognosis is generally dismal with reported median survival from 5-12 months.

Here-in, we report a 28 years old Saudi man with skeletal muscle metastasis to gluteus maximus and rectus abdominis as manifestation of mucinous adenocarcinoma of transverse colon.

Case Presentation

A 28 years old Saudi male presented in our clinic on February 2011, with 5-month history of abdominal discomfort, altered bowel habits and off and on rectal bleeding and 3 kg weight loss. He had no history of any medical illness and smoking and there no family history of malignancy. On physical examination he was found emaciated, mild anemic with no palpable lymphadenopathy and visceralomegaly. Colonoscopy showed mass at splenic flexure of transverse colon and biopsy showed moderately differentiated adenocarcinoma. Baseline carcino-embryonic antigen (CEA) level was 117 ng/ml and computed tomography (CT) of abdomen showed hepatic flexure of transverse colon mass however there were no pulmonary and liver metastasis (Figure 1). Then he underwent extended hemi-colectomy and ileostomy. Histopathology showed, mucinous moderately differentiated adenocarcinoma penetrating into muscularis propria, serosa and pericolic fat. Proximal and distal margins were found negative. Seven out of 13 retrieved lymph nodes were found metastatic and extra-
nodal extension was seen in 2 lymph nodes. Multiple peritoneal nodules were also resected and biopsy was consistent with mucinous adenocarcinoma. His final stage was pT4N2bM0. Patient was planned for adjuvant chemotherapy but he lost to follow up.

In January 2012, he presented in clinic with abdominal pain and altered bowel habits. On physical examination, there was hard nodule was felt at anterior abdominal wall just below the umbilicus and another nodule was found at right lateral thigh. Both nodules were mild tender; however rest of examination was unremarkable. Magnetic resonance imaging (MRI) showed multiple extensive peritoneal masses, the largest noted within the rectovaginal pouch of size $3 \times 5.7 \times 3.4$ cm, invading the base of the urinary bladder, sigmoid, seminal vesicles as well as the distal part of the left ureter (Figure 2). Other peritoneal lesions noted within the right and left iliac fossa as well as the perirectal fossa, invading both ureters in the pelvic sidewalls and peritoneal metastasis on the surface of the liver near segment VI and VII. Positron emission tomography-CT (PET-CT) showed additional skeletal muscle metastasis of rectus abdominis muscle and right gluteus maximus (Figure 3). Incisional Biopsies of rectus abdominis and right gluteal muscle masses were consistent with metastatic adenocarcinoma (Figure 4). Patient was given FOLFOX-4 12 cycles after the JJ stenting and then was treated with radiation therapy for rectus abdominis and gluteal muscles metastases with 6MV photons with total dose 45 Gy in 25 fractions. Patient had progression of disease and he was started on second line chemotherapy FOLFIRI. Patient was alive at 12 months after discovery of skeletal muscle metastasis.

Discussion

Even though skeletal muscle constitutes about 40% of body weight, is the largest organ in the human body, but the skeletal muscle metastasis is a rare entity and differentiation between a primary soft

**Figure 2:** Magnetic resonance imaging (MRI) showing peritoneal mass within the rectovaginal pouch of size $3 \times 5.7 \times 3.4$ cm, invading the base of the urinary bladder, sigmoid, seminal vesicles as well as the distal part of the left ureter.

**Figure 3:** Positron emission tomography-CT (PET-CT) showing skeletal muscle metastases of rectus abdominis muscle and right gluteus maximus.

**Figure 4:** Incisional biopsy of gluteal muscle showing adenocarcinoma with mucin producing cells.
tissue sarcoma and metastatic carcinoma is difficult without biopsy [3]. Most common malignancies metastasizing to skeletal muscles are lung, stomach and genitourinary tumors. Skeletal muscle metastases manifest as painful masses of size 2-12cm [4]. Metastasis from colon cancer to skeletal muscles is very rare manifestation, so far only eight related case reports have been published in literature. [5-12] (Table 1)

The possible mechanism of metastatic spread of adenocarcinoma of colon to the skeletal muscles could be by lymphatics, hematogenous route, and direct extension of primary disease and by manipulation during surgery [13]. In our patient, abdominal wall and gluteal muscle metastases could be due to surgical implantation. Having obtained clear lateral margins at the initial surgery, the metastases were likely to have been secondary to the seeding of exfoliated tumor cells during tumor mobilization [14].

Skeletal muscle metastases are commonly thought to be associated with poor average survival because of underlying widespread disease, with an average of 5-12 months after diagnosis; it warrants aggressive surgical resection, radiotherapy and the use of systemic chemotherapy [15]. In our patient resection was not done because of wide spread peritoneal metastasis.

In conclusion, we have reported a case of colon cancer with gluteus maximus and rectus abdominis muscle metastasis, which is extremely rare. CT- PET can be helpful to localize the site for metastatic deposits and immunostaining whenever possible shall be incorporated to reach the final diagnosis and for prompt treatment.

References

Table 1: Cases of skeletal muscle metastasis secondary to adenocarcinoma of colon reported from 1990-2012

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Site</th>
<th>Primary location</th>
<th>Treatment</th>
<th>Survival After diagnosis of skeletal metastasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takada J, et al.</td>
<td>71 years</td>
<td>Iliopsoas</td>
<td>Sigmoid colon</td>
<td>RT + FOLFOX4+ resection and S-1</td>
<td>Alive at 12 months</td>
</tr>
<tr>
<td>Naik VR, et al.</td>
<td>56 years</td>
<td>Rectus abdominis</td>
<td>Ascending colon</td>
<td>Surgical resection + FOLFOX4</td>
<td>NA</td>
</tr>
<tr>
<td>Burgueno Montanes C, et al.</td>
<td>60 years</td>
<td>lateral rectus of orbit</td>
<td>Recto-sigmoid colon</td>
<td>RT + FOLFOX4</td>
<td>NA</td>
</tr>
<tr>
<td>Hasegawa S, et al.</td>
<td>60 years</td>
<td>Extensor carpi ulnaris</td>
<td>Transverse colon</td>
<td>Surgical resection + FOLFOX4</td>
<td>NA</td>
</tr>
<tr>
<td>Homan HH, et al.</td>
<td>72 years</td>
<td>Erector spinae</td>
<td>Descending colon</td>
<td>Surgical resection + FOLFOX4</td>
<td>NA</td>
</tr>
<tr>
<td>Bonjer HJ, et al.</td>
<td>NA</td>
<td>Rectus abdominis</td>
<td>Recto-sigmoid colon</td>
<td>FOLFOX4</td>
<td>NA</td>
</tr>
<tr>
<td>Jacquet P, et al.</td>
<td>NA</td>
<td>Rectus abdominis</td>
<td>NA</td>
<td>Surgical resection + FOLFOX4</td>
<td>NA</td>
</tr>
</tbody>
</table>

Present case
- 28 years male
- Gluteus maximus
- Rectus abdominis
- Transverse colon
- RT + FOLFOX4
- Alive at 12 months

Abbreviations: RT= Radiation Therapy; FOLFOX4= Folinic acid 5-flourouracil oxaliplatin; NA= Not Applicable

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