CLINICAL CASE

Unusual skeletal muscle metastasis from gastric adenocarcinoma

Métastase musculaire d’un adénocarcinome gastrique : à propos d’un cas

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Summary  Patients with gastric adenocarcinoma frequently develop hepatic metastases or peritoneal carcinosis but involvement of the skeletal muscle is extremely rare. We report the case of a 71-year-old man with a painful soft tissue mass in the right shoulder. Two years previously, the patient had been treated for a locally advanced gastric carcinoma (surgery plus chemoradiotherapy). Surgical exploration with biopsy showed skeletal muscle metastasis from the gastric adenocarcinoma in the deltoid muscle. Chemoradiotherapy resulted in complete regression of symptoms from the metastatic lesion. The patient is alive and free of recurrence in the deltoid muscle after a follow-up of 13 months. Based on this case study, the difficulty of diagnosing skeletal muscle metastases, the prognosis and treatment options are discussed.

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Résumé  Les patients atteints d’un adénocarcinome gastrique développent souvent des métastases hépatiques ou péritonéales mais un envahissement musculaire est exceptionnel. Nous rapportons le cas d’un patient de 71 ans qui a présenté une masse douloureuse des tissus mous de l’épaule droite. Deux ans auparavant, le patient avait été opéré d’un cancer gastrique localement avancé et avait reçu une radiochimiothérapie adjuvante. L’exploration chirurgicale avec biopsie a confirmé la présence d’une métastase musculaire du deltoïde d’origine gastrique. Un traitement par radiochimiothérapie a permis la disparition complète des symptômes locaux. Le patient est vivant à 13 mois sans récidive tumorale deltoïdienne. À partir de ce cas clinique, nous discutons les difficultés diagnostiques des métastases musculaires, leurs pronostics et leurs traitements.

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Case report

A 71-year-old man presented with a 2-month history of a soft tissue mass. Two years before, the patient had had an adenocarcinoma of the stomach treated by partial gastrectomy combined with partial pancreatectomy due to pancreatic invasion. Resection was complete and TNM stage was pT4N1M0. The tumor was poorly differentiated. Tumor length was 7.5 centimeters with one lymph node invasion. The patient underwent adjuvant chemoradiotherapy according to standard guidelines. Treatment was complete with radiotherapy delivering 45 Grays combined with 5-fluorouracil. Follow-up examination had been normal (thoracic and abdominal CT scan) for 11 months after the end of chemoradiotherapy. The patient then developed a soft tissue mass in the right shoulder whose volume increased, causing functional impotence and pain. Ultrasound showed a tumoral mass in the deltoid muscle measuring $3 \times 4 \times 7$ centimeters with irregular limits. Complete resection was impossible due to the local extension of the tumor and only a biopsy was performed. The pathological examination showed a poorly differentiated adenocarcinoma, positive cytokeratine 7 and negative cytokeratine 20 immunohistochemistry (Fig. 1). Chest and abdominal CT scan confirmed a solid mass in the right deltoid muscle with no vessel or bone invasion (Fig. 2) as well as massive invasion of mediastinal lymph nodes. The clinical and histological features were suggestive of metastasis from gastric adenocarcinoma. After reaching a multidisciplinary consensus, the patient underwent chemoradiotherapy in the right shoulder. A bi-weekly regimen of 5-fluorouracil and leucovorin (LV5FU2) plus cisplatin was administered. The conformational radiotherapy dose was 45 Grays. These treatments resulted in a complete response with total regression of the deltoid mass on computed tomography scan as well as regression of pain and functional impotence. Moreover, the disease stabilization occurred for mediastinal lymph node invasion. The patient is alive and free of recurrence in the deltoid muscle after 13 months of follow-up (ongoing treatment with 5-fluorouracil and cisplatin).

Discussion

Skeletal muscle metastases are uncommon, making diagnosis difficult and the treatment of these metastases are not well defined. Differentiation between a primary soft tissue sarcoma and metastatic carcinoma is difficult without biopsy.

The incidence of skeletal muscle metastases is unknown but approximately 0.16 to 0.03% has been reported in clinical practice [1,2] and 0.8% in an autopsy study [3]. The rarity of skeletal muscle metastases is difficult to explain since the muscle is well vascularized. However, blood turbulence in the muscle during exercise and lactic acid production is probably not good for tumor cell proliferation [4]. The most frequent sites of involvement are the thigh, shoulder, arm, leg, abdominal wall and chest wall. Intramuscular metastases are frequently multiple [1,2,5,6].

The primary carcinomas which most often result in clinically recognized skeletal muscle metastases are those of the lung, kidney and breast [1,2,5,6]. The most common histological diagnosis is adenocarcinoma. Skeletal metastases related to gastric carcinoma are uncommon and there are only few sporadic cases reported in the literature [7–14]. Skeletal muscle metastases from primary gastrointestinal tract tumors are exceptional because these tumors mainly disseminate in the portal circulation with hepatic metastases and other metastases are infrequent. In most cases, skeletal muscle metastases occur in patients with a previously identified malignancy [1,5,9]. The median delay between the primary tumor and occurrence of skeletal metastasis is approximately 20 months but may be may years [1]. Frequently, skeletal muscle metastases occur as the first manifestation of unrecognized disseminated disease or an occult primary malignancy. In approximately 25% of cases, there is no previous history of primary cancer [1].

Clinical features of skeletal muscle metastases are not specific and closely resemble those of soft tissue sarcomas [15]. In most cases, patients are referred with a diagnosis of soft tissue sarcoma and biopsy is necessary for the diagnosis of muscle metastases [2,10]. The "painful mass" is the most common presentation and occurs more often in patients with skeletal muscle metastases than in sarcomas (growing, painless soft tissue masses) [2,5,10]. Magnetic resonance imaging (MRI) has become the technique of choice for distinguishing muscle metastases from sarcomas and other diseases but the radiographic characteristics are not sufficiently specific [1,2,13,16]. Metastatic lesions are usually hypointense on T1 weighted images, hyperintense on T2 weighted images and enhanced with gadolinium but these findings are also observed in primary soft tissue sarcomas. Extensive peritumoral enhancement associated with central necrosis is a characteristic feature of skeletal muscle metastases [1]. MRI also distinguishes skeletal muscle metastasis from bone metastases with skeletal invasion. Fine needle aspiration biopsy is helpful especially when patients have no previous history of primary cancer. Biopsy has the theoretical risk of tumor seeding but this is not a problem because the disease is already incurable. Moreover, chemoradiotherapy will also treat any possible tumor seeding.

The prognosis principally depends on the primitive tumor type but is generally poor as there are multiple disseminated...
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Figure 2 Pathological examination. A. Adenocarcinoma with poor differentiation. B. Positive cytokeratine 7 immunohistochemistry.

metastases. In cases reported in the literature, median survival is less than 10 months but additional patients have been reported to be alive with the disease after 5 years follow-up [1,5,6,10].

Treatment options, depending upon the clinical setting, include chemotherapy, radiotherapy and excision [1,2,5]. Chemoradiotherapy (40–50 Grays) controls the pain and the size of the metastatic lesion but this treatment depends upon the extent of involvement and patient’s performance status [1]. However, the complications associated with radiotherapy such as skin burn and muscle contracture are frequently encountered. In carefully selected patients with isolated skeletal muscle metastases, particularly after a long disease-free interval, excision may be indicated [17]. In our case report, radiotherapy and chemotherapy resulted in long term control of skeletal muscle metastasis.

In conclusion, the diagnosis of skeletal muscle metastasis should be considered in the differential diagnosis of any painful soft tissue mass because there are no clinical or radiographic characteristics that distinguish metastatic carcinoma in muscle from soft tissue sarcomas. However, an extensive peritumoral enhancement on MRI should suggest skeletal muscle metastases. Biopsy is particularly recommended for diagnosis especially when patients have no previous history of primary cancer or after a long disease-free interval. Although chemoradiation frequently controls skeletal muscle metastases, prognosis remains poor.

Conflict of interests

None.

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References


