Muscular metastasis from mesocolic and duodenal leiomyosarcoma.

A case report and a review of the literature

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Muscular metastasis from mesocolic and duodenal leiomyosarcoma. A case report and a review of the literature

BACKGROUND: *Mesenteric and duodenal leiomyosarcomas are very rare malignancies. Muscular metastases from leiomyosarcoma are even more rare. Surgery is the only chance of cure and should be attempted whenever possible. The relief of symptoms and the prevention of recurrences are ultimately the aims of surgery. We present a unique case of mesocolic and duodenal leiomyosarcoma with muscular metastases.*
CASE REPORT: *A 61 years old woman was treated by radical resection including left nefrectomy and left hemicolectomy for a leiomyosarcoma of the left mesocolon. Three years after the first surgery a leiomyosarcoma of the duodenal wall was diagnosed. Following a careful evaluation that ruled out the presence of other secondary locations, she underwent pancreatoduodenectomy. Three months later she observed a small, mildly painful swelling in the left thigh, rapidly growing to a diameter of 4 cm over a month period. The MRI showed a low-signal intensity malignancy in T2-weighted images whereas the lesion was homogeneously enhanced by Gadolinium on T1-weighted imaging. The histological examination after excision confirmed the clinical suspicion of a metastasis from high grade leiomyosarcoma. Successively the patient underwent a palliative chemotherapy treatment with epirubicin and ifosfamide for three cycles. The patient experienced a progression of disease with multiple pulmonary and encephalic metastases five months later.*
CONCLUSION: *Muscular metastases from leiomyosarcoma are occasionally described in the literature. The apparition of muscular metastases is considered a negative prognostic factor and shortly precedes massive distant diffusion of the malignancy. Denervation syndrome can be a risk factor for muscular metastases. To our knowledge, this is the first report of a skeletal-muscle metastasis following mesenteric and duodenal leiomyosarcoma.*

KEY WORDS: Leiomyosarcoma, Muscolar metastases.

Background

Leiomyosarcoma is a rare malignant neoplasm, with an incidence lower than that of other sarcomas, such as liposarcoma, malignant fibrous histiocytoma, and rhabdomyosarcoma [1-2]. Mesocolic origin of leiomyosarcomas is rare. The only chance of cure is a complete surgical resection. However the rarity of these malignancies makes the interpretation of their biological behavior difficult. Only few cases have been described in the literature [3-5].
The case here reported of mesenteric LMS, followed three years later by duodenal-ileal localization and then by a muscular metastasis, is the first in the literature. The rarity of muscular metastases is usually explained by biological environment unfavorable to cancer cells seeding. Denervation has been postulated as a risk factor in

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experimental studies and the case here reported could give a clinical confirmation to this hypothesis.

Case Presentation

A 61 years old woman with a three months history of lumbar pain and left thigh and leg functional deficit was evaluated through abdominal ultrasound and CT scan. She had a large retroperitoneal mass, 13 x 6 x 8 cm in dimension, involving the left kidney, ureter and psoas muscle and dislocating the colon, without a clear plane of separation (Fig. 1). During laparotomy the mass was found to arise from the left mesocolon and an extended resection including the left colon and kidney was performed. The histological evaluation showed a leiomyosarcoma of the left mesocolon that reached the renal capsule. The colonic wall and the kidney were not involved. The patient mainly benefited from surgery and the symptoms disappeared. Successively, a follow-up was started. Three years later the patient presented with asthenia and aspecific abdominal pain. An abdominal CT scan showed a mass starting from right retroperitoneal space, involving duodenum, superior mesenteric vein and right kidney with hydronephrosis (Fig. 2). No abnormal physical findings were found and blood tests showed a mild anemia (hemoglobin 9,8 g/dl) and an increase in LDH value (1356 UI/L).
A total body CT scan ruled out the presence of distant metastases and so the patient underwent pancreatoduodenectomy (Whipple resection) (Fig. 3). No major surgery-related complications occurred and after 15 days she was discharged from hospital. The histological examination described a duodeno-ileal leiomyosarcoma, GIII, with spindle and epithelioid cells, a high pleomorphism, and a mitotic index > 5 (Fig. 4).

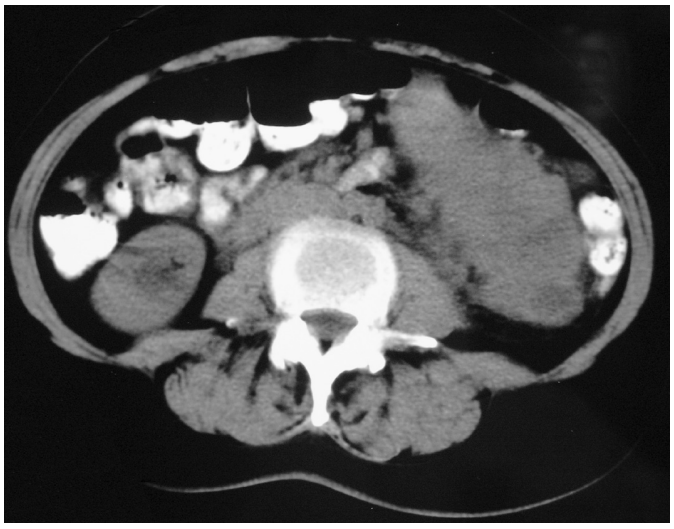

Fig. 1: Abdominal CT scan showing a large retroperitoneal mass, cm 13 x 6 x 8, involving the left kidney, the ureter and the psoas muscle and dislocating the bowel without a clear plane of separation.

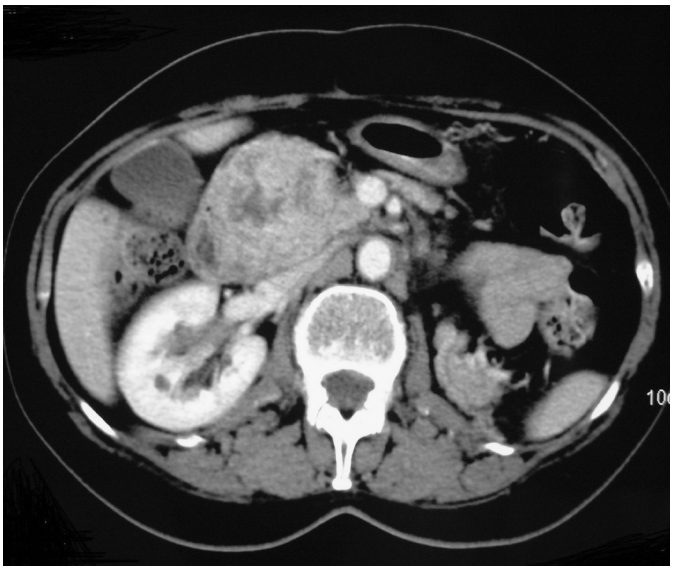

Fig. 2: Abdominal CT scan showing the duodenal mass.

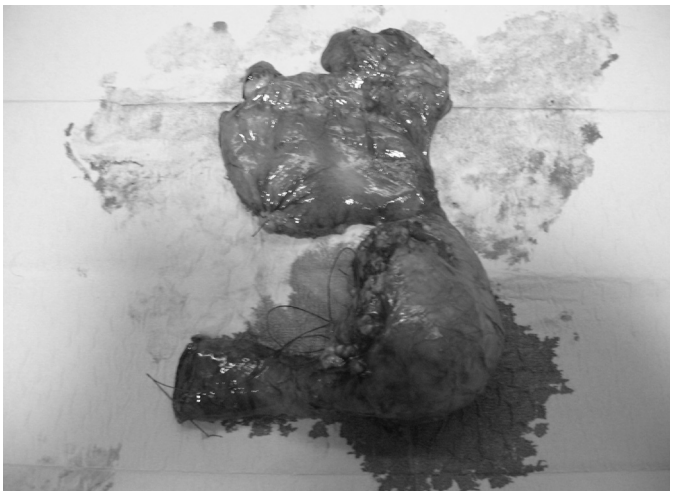

Fig. 3: The duodeno-ileal leiomyosarcoma after pancreatoduodenectomy.

Three months later the patient presented an unusual sciatalgia and a small painful swelling in the posterior face of the right thigh, that in one month rapidly grew to a diameter of 4 cm. The MRI showed a malignancy, with low-signal intensity in T2-weighted images, but hyperintense enhancement in T1-weighted images. The neoplasm was vascularized by an enlarged branch of deep femoral artery (Fig. 5). No biopsy was attempted due to the neoplastic aspect of the lesion. The patient underwent a large surgical excision (Fig. 6) and the histological evaluation confirmed the clinical suspicion of metastasis from high-grade leiomyosarcoma. Successively the patient underwent a palliative chemotherapy treatment with three cycles of epirubicin and ifosfamide. Unfortunately, five months later the patient experienced a progressive disease with multiple encephalic and pulmonary metastases.

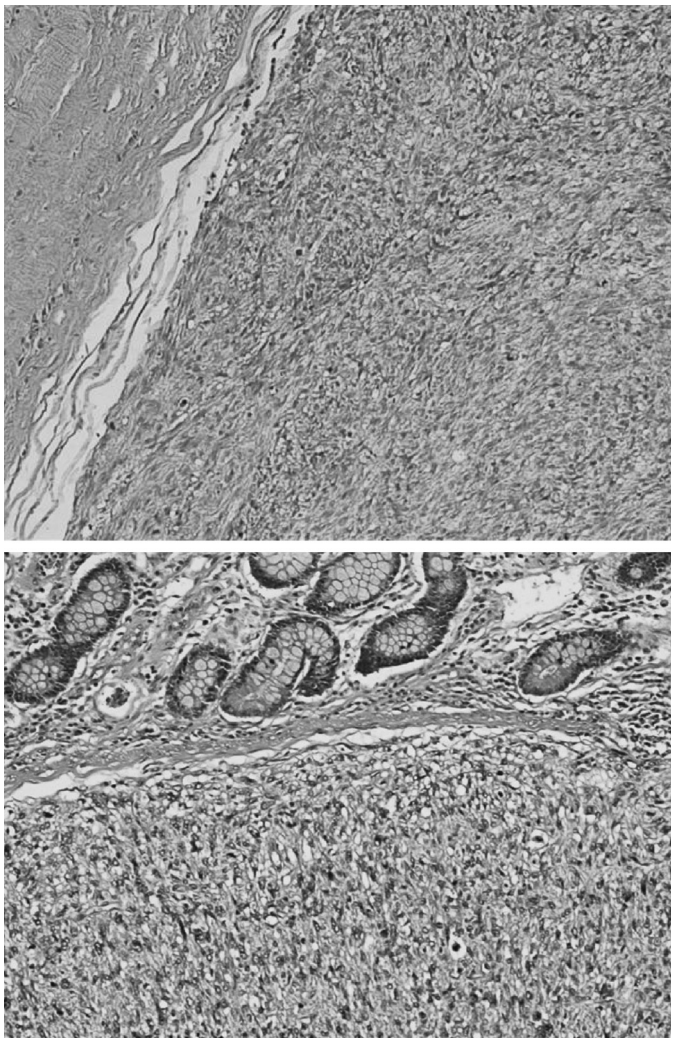

Fig. 4: Duodeno-ileal leiomyosarcoma, GIII, with spindle and epithelioid cells, a high pleomorhism, and a mitotic index > 5 (hematoxylin and eosin)

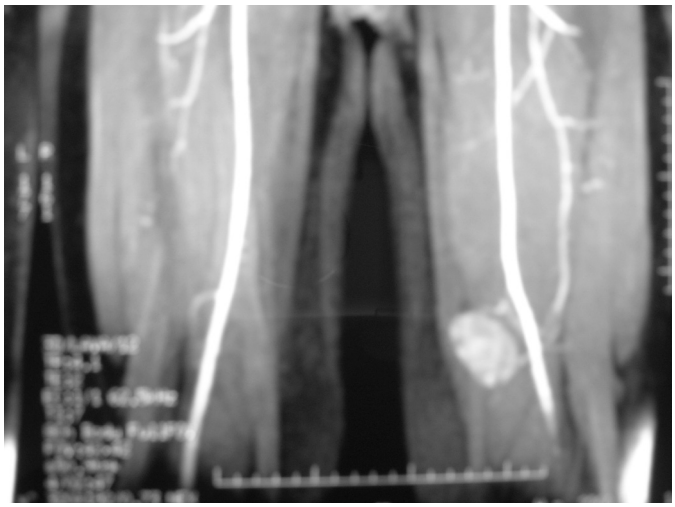

Fig. 5: The MRI showing the lesion involving the posterior face of left thigh.

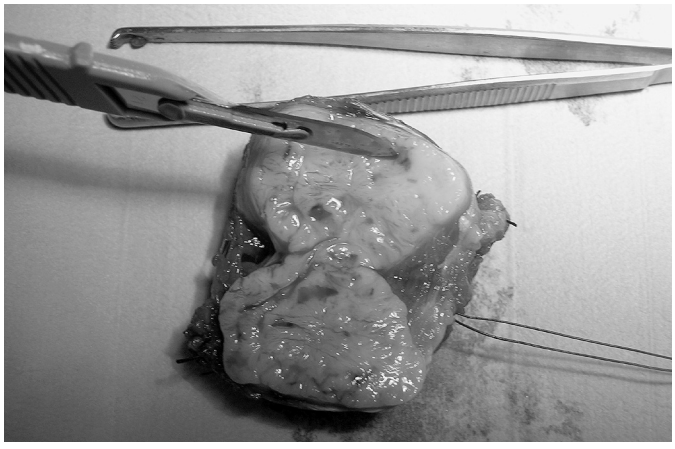

Fig. 6: The lesion involving the posterior face of left thigh: the operatory specimen.

Discussion

Primary mesenteric leiomyosarcomas (LMSs) are very rare malignances and only few cases are reported in the literature. The incidence of primary mesenteric LMS is evaluated in 1/350,000 cases of LMS [3]. The complete surgical resection of the mass is the only chance of cure. Some Authors consider primary mesenteric LMS as a histological form of easily resectable retroperitoneal neoplasms, due to favorable location [4]. In our case the complete surgical resection of the primitive tumor was achieved and diagnosis was confirmed by histological examination.

Also duodenal LMSs are rare neoplasms. After their first description, in 1920, about 200 cases have been reported, accounting for almost all mesenchimal tumors of the small intestine. In 1983 the recognition of a different origin for most of these tumors led to the change in terminology to GISTs (Gastro-Intestinal Stromal Tumors) [6]. Between late '80s and 2000 the terms GISTs and leiomyosarcoma [7] were indifferently used in the literature, leading to uncertainty and confusion in the interpretation of pathologic and prognostic features. As a consequence, data from a large part of the literature are hardly utilizable for identification of true LMSs. GISTs account for 1% of all gastrointestinal tumors. The identification of CD117 and other enzymes as typical histochemical markers for GISTs, led to exclude true smooth muscle cell tumors from this classification. Moreover in 1998, GISTs malignancies were identified as originating from Cajal cell [8]. In 2005 leiomyosarcomas and schwannomas were excluded from GISTs.

Miettinen and colleagues [9] examined 292 GISTs and 211 other tumors that entered in the differential diagnosis. They found only 10 leiomyosarcomas (4 in small intestine, 4 in colon and 2 in rectum). Bal and colleagues

[10] reported only 2 LMS and 2 benign leiomyomas from a group of 9 mesenchimal tumors in a series of 55 duodenal tumors.
A second study of Miettinen and colleagues [11] showed 11 smooth muscle cell tumors (6 LM and 5 LMS) in a group of 167 mesenchimal tumors of duodenum including 156 GISTs, observed between 1970 and 1996.
The frequency of LMS involvement of the small intestine is slightly higher in the jejunum, followed by the ileum and then the duodenum [12].
LMSs of the small intestine have the ability to spread via several routes. Similar to other sarcomas, haematogenous spread is common, especially to the liver and lungs. Unlike other sarcomas, however, lymphatic spread and peritoneal seeding are more commonly seen [12]. Duodenal metastases are even more uncommon than primitive lesions.
Due to the rarity of these malignancies, it is very difficult to speculate over their biological behavior.
Pancreaticoduodenectomy, first described by Whipple in 1935, is the surgical treatment of choice for duodenal malignancies [13].
The only case of skeletal muscle metastasis described in the literature originated from a uterine LMS [14]. In addition there are reports of muscular metastases originating from an intestinal histyocitosarcoma [15] and from other extra-intestinal neoplasms such as cholangiocarcinoma [16], renal cell carcinoma [17], lung cancer [18] and breast cancer [14]. In all these cases muscular metastases were rapidly followed by massive neoplastic diffusion.
We observed another case with multiple muscular, lung and bone metastases from a papillary thyroid cancer.
A rapidly growing mass of the muscle is more often a primitive malignancy than a metastasis [19]. Various factors have been indicated to protect from metastases of the muscle such as tensile factors, local pH, or lactic acid and adenosine [20]. The latters are well known as antiangiogenetic factors [14].
Local traumas [21] or denervation could promote the metastatisation to muscles [22].
In our case, no history of local trauma was recorded but pain in the left lumbar region and in the left thigh along with a loss of functionality of the whole left leg were the first symptoms of the primitive malignancy originating from left mesocolon.
After radical resection of the mass along with left colon and kidney removal, the patient had a complete remission of the symptoms. We can speculate on the condition of transitory peripheral nervous system suffering, considering the patient history of pain, as a risk factor for the development of the muscular metastasis.
Experimental data reported by Weiss et al. [22] gave strength to this hypothesis. Weiss, in fact, found that cancer cells better survive in denervated muscle compared with electrically stimulated muscles.
The detection of muscular metastases occurs occasionally because they usually are asymptomatic. Computed tomography scan, scintigraphy and MRI and more recently PET [23] are considered the best exams to diagnose and monitor LMS. MRI gives the more accurate results in the presence of a symptomatic muscular lesion. The MRI description of the muscular lesion was typical of a metastasis in our case.
Histology definitively demonstrated the presence of a muscular metastasis from a high grade LMS.

Conclusion

Though we cannot rule out the primitive nature of the second, duodenal leiomyosarcoma, the case here presented is to our knowledge the first example of duodenal and skeletal muscle metastasis from a mesenteric leiomyosarcoma in the literature.
While an intra-abdominal secondary resection can be pursued with a potentially curative intent, regardless of the primitive neoplasm, the presence of muscular metastases, is predictive of a dismal prognosis. A history of muscular trauma or radicular syndromes can be considered a risk factor for muscular localization of metastases.

Riassunto

I leiomiosarcomi del mesentere e del duodeno sono tumori molto rari e le loro metastasi a sede muscolare sono ancora più rare. La chirurgia rappresenta la sola possibilità di trattamento e va adottata ogni volta che ciò sia possibile, con lo scopo di alleviare i sintomi e prevenire le recidive.
Qui viene presentato un caso unico di leiomiosarcoma mesocolico e duodenale con metastatizzazione a sede muscolare. Si tratta di una donna di 61 anni già trattata con una resezione radicale comprendente una nefrectomia sinistra ed emicolectomia sinistra per un leiomiosarcoma del mesocolon sinistro.
Tre anni dopo questo primo intervento venne diagnosticato un leiomiosarcoma della parete duodenale. Dopo uno studio attento che permise di escludere altre localizzazioni secondarie, la paziente venne sottoposta a duodeno-cefalo-pancreasectomia.
Tre mesi dopo la paziente osservò la comparsa di una piccola tumefazione alla coscia sinistra, modicamente dolente ma in rapida crescita fino ad un diametro di 4 cm entro un periodo di un mese. La RM dimostrò trattarsi di un tumore con segnale di bassa intensità nelle immagini pesate T2 mentre la lesione mostrava un enhance omogeneo col Gadolinio sulle immagini pesate T1.
L'esame istologico dopo escissione confermò il sospetto clinico di metastasi da leiomioma di grado elevato. Successivamente la paziente venne sottoposta ad un trattamento chemioterapico palliativo con epirubicina e ifosfamide per tre cicli, ma andò incontro a progressione di malattia con comparsa di meta statizzazione multipla al polmone e all'encefalo nei successivi cinque mesi.

Le metastasi muscolari da leiomioma sono di rara osservazione in letteratura. La loro comparsa va considerato come un fattore prognostico negativo e precede di poco la disseminazione metastatica massiva a distanza della neoplasia. La sindrome da denervazione, come è ipotizzabile sia avvenuto in questa paziente, può rappresentare un fattore di rischio per la localizzazione di metastasi muscolari.
A nostra conoscenza questo è il primo caso affidato alla letteratura di una metastasi nella muscolatura scheletrica da parte di un leiomiosarcoma mesenterico e duodenale.

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