Muscle metastasis from hepatocellular carcinoma in a patient treated with TACE

D. Sirigu^a, L. Loi^a, R. Mura^b, V. Migaletto^b, G. Campisi^{b,*}

^a Brotzu Hospital, Cagliari, Italy

^b Sardinian Mediterranean Imaging Research Group, Cagliari, Italy

KEYWORDS

Metastasis;
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Abstract The authors describe a rare case of hepatocellular carcinoma that metastasized to the pectineal muscle of the right thigh. The patient had been treated with surgical procedures and with multiple sessions of transarterial chemoembolization, one of which was complicated by a right femoral artery hematoma at the catheter insertion site. It is unclear whether the muscle metastasis was caused by blood-borne spread or by tumor-cell seeding caused by the TACE procedure.

Sommario Gli autori descrivono un raro caso di localizzazione metastatica da epatocarcinoma in sede muscolare (muscolo pettineo della coscia dx); il paziente era stato sottoposto a procedure chirurgiche ed a Tace.

Per tale motivo non è dimostrabile se l'inseminamento sia legato ad una diffusione ematogena con interessamento del muscolo pettineo o sia legato ad un seeding iatrogeno secondario alla manovra terapeutica.

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Introduction

Hepatocellular carcinoma (HCC) is one of the most aggressive tumors known and the cause of millions of deaths per year all over the world. Its biological characteristics include a strong tendency to produce distant metastasis (compared with other malignant tumors). Blood-borne spread to extrahepatic sites occurs in 50% of all cases. The first detectable metastases are found in the following organs (in decreasing order of frequency): lungs, adrenal glands, intestine, bones, spleen, heart, and kidney.

Locoregional ablative treatments (percutaneous ethanol injections, laser or radiofrequency thermoablation) can lead to the development of subcutaneous metastasis as a result of tumor-cell seeding along needle-insertion pathways. Thus far, muscle metastases from HCC have never been described. We describe a case of HCC metastasis to the pectineal muscle, which may have been provoked by a transarterial chemoembolization treatment (Figs. 1–3).

Case report

The patient was a 61-year-old retired carpenter.
Ex-occasional drinker
Never taken drugs
The family history revealed a brother and a sister with HCC.

* Corresponding author. Via Caboni 14, 09125 Cagliari, Italy.
E-mail address: girolamo.campisi@gmail.com (G. Campisi).

Fig. 1 On ultrasound, the metastatic lesion appeared as a solid, inhomogeneously hypoechoic mass located in the anteromedial aspect of the pectineal muscle, beneath the femoral vascular bundle. Intralesional vascularization was evident on the color Doppler scan.

Fig. 2 On magnetic resonance imaging, the mass appeared as a solid, homogeneous, well defined, oval-shaped neoformation located in the right inguinal area, in front of the pectineal muscle. The mass caused anterior displacement of the neurovascular bundle and marked compression of the right femoral vein. The lesion appears well vascularized.

Past medical history

Previous trauma with rib fractures and fracture of the left hand; brucellosis in 2001; insulin-dependent diabetes diagnosed in 2004; duodenal ulcer related to *Helicobacter pylori* infection diagnosed in 2005; colonoscopy in ANNO: angiodysplasia of the cecum and ascending colon; micro-polyposis (histology: hyperplastic).

History of present illness

- In 1999, during an ultrasound scan performed fortuitus the patient was found to have binodular HCC (segment VIII and II) and viral cirrhosis (hepatitis B-related). Both lesions were treated with transarterial chemo-embolization (TACE).
- In 2001 an extended right lobectomy was performed with resection of segment II. Histological examination

Fig. 3 Gross and microscopic pathology. The nodular mass (about 5 cm in diameter) had a knotty surface. Sectioning revealed a multinodular aspect with irregular and confluent nodules. Histological examination revealed well-differentiated HCC (trabecular and pseudoglandular architecture) with an **Edmonson** score of 2. The mass was surrounded by skeletal muscle fibers.

revealed differentiated HCC without invasion of the Glisson capsule.

- February 2005: Binodular relapse (segment IV).
- Four TACE procedures were performed, one of which was complicated by the formation of a hematoma in the femoral artery at the site of catheterization.
- 2007: Work-up for possible liver transplantation including abdominal and lymph node ultrasound/PET/CT and MRI of the abdomen. Four HCC-related nodules were discovered, 2 in segment IV and 2 in segment II. A well defined, vascularized mass measuring 4 cm in diameter was noted in front of the right pectineal muscle. The mass had displaced the neurovascular bundle and was compressing the right femoral vein.
- An ultrasound-guided biopsy of the mass revealed well-differentiated metastatic HCC with a trabecular and pseudoglandular arrangement. Edmonson score: 2.
- Due to the presence of this extrahepatic metastasis, the patient was removed from the Transplant Waiting List.

Ethical approval for this study was granted by the Medical Research Ethics Committee of our university, and informed consent was obtained from all patients.

Discussion

In the natural history of HCC, metastases to distant organs are usually discovered in patients with advanced disease [1]. Blood-borne spread is the rule, and the most frequently affected organs is the lung. Lymph node and bone metastases are less frequent [4,8]. Nakashima analyzed 232 patients who had died of HCC, and reported the ORL zone (3.1% of the cases) and the brain (2.7%) as unusual sites of metastatic involvement [3].

The spread of neoplastic cells is a possible complication of invasive diagnostic or therapeutic procedures [2,6,7,9]. It has been reported after fine-needle aspiration liver biopsy (0.3–2.0%), percutaneous ethanol injections (0.6–2.0%), and radiofrequency thermal ablation (0.6%), but to our knowledge, this complication has never been described after TACE. This is also the first report of muscle metastasis from HCC after a therapeutic intervention [5].

Conclusion

During clinical and instrumental follow-up of patients treated for HCC, extrahepatic spread may be noted. This

includes metastasis to distant locations or spreading along the needle-insertion pathways used for diagnostic or therapeutic interventions. This report raises the possibility that HCC cells were spread to the inguinal zone during catheterization of the femoral artery for TACE. In all probability, the seeding occurred when the catheter was being withdrawn. An event of this type has never been reported and for this reason it deserves to be emphasized. This case illustrates the importance of close ultrasonographic follow-up assessments of the insertion site in HCC patients treated with TACE.

Conflict of interest statement

The authors have no conflict of interest.

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