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CASE REPORT

Intraperitoneal dedifferentiated liposarcoma: A case report

Ali Karaman, Mehmet Eşref Kabalar, Önder Özcan, Timur Koca, Doğan Nasır Binici

Ali Karaman, Department of Medical Genetics, State Hospital, Erzurum 25240, Turkey
Mehmet Eşref Kabalar, Department of Pathology, State Hospital, Erzurum 25240, Turkey
Önder Özcan, Department of General Surgery, State Hospital, Erzurum 25240, Turkey
Timur Koca, Department of Radiation Oncology, State Hospital, Erzurum 25240, Turkey
Doğan Nasır Binici, Department of Internal Medicine, State Hospital, Erzurum 25240, Turkey
Author contributions: Karaman A performed the PCR analysis of adipose tumor samples and wrote the article; Kabalar ME analyzed the biopsy material; Binici DN performed the physical examination; Özcan Ö performed the surgical operation; Koca T performed the radiation therapy.
Correspondence to: Ali Karaman, MD, Erzurum State Hospital, (Erzurum Numune Hastanesi), Department of Medical Genetics, Erzurum 25240, Turkey. alikaramandr@hotmail.com
Telephone: +90-442-2321139 Fax: +90-442-2321390
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Abstract

Dedifferentiated liposarcoma is a variant of liposarcoma with a more aggressive course. Mutations of the *p53* gene have been found in different types of soft tissue sarcoma. It is generally accepted that *p53* mutations in human malignant tumors are often related to a poor prognosis. In our case, analysis of *p53* gene mutation in tumor samples was performed. *p53* gene mutation was observed in dedifferentiated tumor tissue samples but not in well-differentiated tumor tissue samples. It has been reported that *p53* gene mutation occurs most commonly in the retroperitoneum and rarely in other anatomic locations. Herein we report a case of dedifferentiated liposarcoma located at intraperitoneum.

Key words: Dedifferentiated liposarcoma; *p53* gene; Mutation; Intraperitoneum

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INTRODUCTION

Liposarcoma is one of the most frequent malignant soft tissue tumors and currently classified into five main subgroups: well-differentiated, myxoid, round cell, pleomorphic, and dedifferentiated[1]. It is generally accepted that *p53* mutations in human malignant tumors are often related to a poor prognosis[2,3]. Taubert *et al*[4] reported that patients with nonframeshift mutations have a rather poor prognosis. Moreover, *p53* overexpression alone is associated with a poor clinical outcome[5,6]. Mutations of the *p53* gene have been found in different types of soft tissue sarcoma[7]. Well-differentiated liposarcoma is the most common variant. Dedifferentiated liposarcoma, a variant of liposarcoma with a worse prognosis, has a less frequency and occurs most commonly in retroperitoneum[8,9].

CASE REPORT

A 62-year-old man presented with a 3-mo history of constant right flank discomfort, fatigue, recent weight loss, loss of appetite and abdominal fullness. Physical examination revealed an abdominal mass in the right lower quadrant. T1-weighted magnetic resonance image (MRI) of the abdomen demonstrated a high-intensity mass. The tumor, located at intraperitoneum, was in the inferio-lateral to the cecum (Figure 1). Laboratory tests including tumor markers showed no abnormality. Surgery was performed to expose the tumor through a right lower abdominal incision. Gross examination revealed a 10 cm yellow, fleshy mass. Pathological examination revealed a dedifferentiated liposarcoma (Figure 2). Immunolabeling for S-100 was positive, while CD117 (C-KIT) and CD34 were negative in the well-differentiated tumor tissue samples, thus ruling out a gastrointestinal stromal tumor. Based on the histology and immunoprofile, a diagnosis of dedifferentiated liposarcoma was established. Furthermore, we investigated the occurrence of *p53* gene mutations in the tumor samples.

DNA extraction

Tissue samples were incubated for 15 min at 65℃,

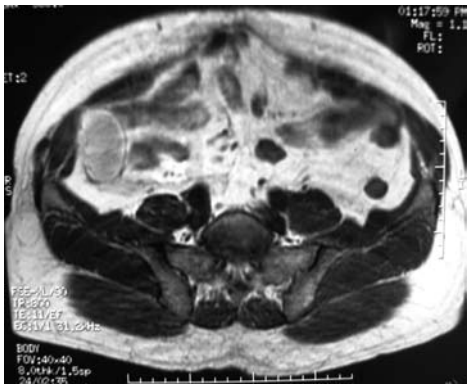

Figure 1 T1-weighted magnetic resonance image (MRI) demonstrating a high-intensity mass.

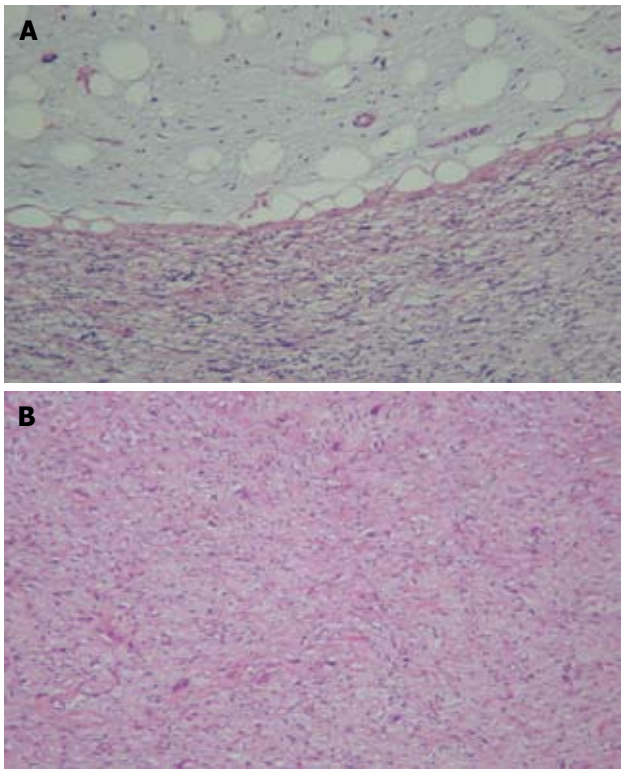

Figure 2 Well-differentiated tumor shows numerous lipoblasts and the dedifferentiated tumor resembles pleomorphic, spindle cells with hyperchromatic nuclei (HE, x 100) in the area revealing an abrupt transition from the well-differentiated to the dedifferentiated tumor (**A**), and dedifferentiated tumor shows low cellularity, fusiform cells with small hyperchromatic nuclei, and abundant collogen in the low grade fibrosarcoma area (**B**) (HE, x 100).

then overnight at 37℃ in a lytic solution containing 1 mg/mL proteinase K, 10 mmol/L Tris/HCl, 10 mmol/L ethylene diamine tetraacetic acid, 150 mmol/L NaCl, 0.4% sodium dodecyl sulfate. DNA was extracted twice with an equal volume of 1:1 SS-phenol/chloroform, and precipitated for 2 h at -20 ℃ after addition of 0.1 volume of 3 mol/L sodium acetate, 20 μg of glycogen as a carrier, and 2.5 volume of 100% ethanol. After centrifugation, the precipitate was washed with 2 mL of 80% ethanol, dried with a Speed Vac concentrator, and reconstituted with 50 μL of TE buffer.

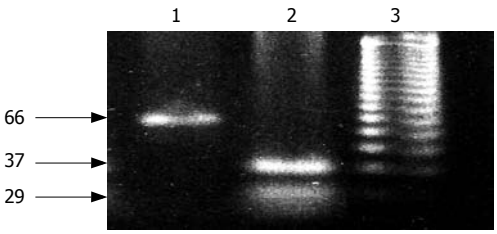

Figure 3 Amplification of the BstU1 within exon 4 produces a 66 bp long segment while cleavage results in 37 bp and 29 bp long fragments. Lane 1: No mutation of *p53* gene in well-differentiated tumor; lane 2: Mutation of *p53* gene in dedifferentiated tumor; lane 3: DNA marker.

PCR analysis

PCR was performed using a thermal cycle (PE 9700) with 50 ng of genomic DNA extracted from biopsy samples, 20 pmol of each primer, four deoxynucleotide triphosphates (dNTPs), reaction buffer and 1 μL (5 units) of fermentase Taq polymerase in a reaction volume of 100 μL. The PCR conditions consisted of an initial cycle at 95℃ for 10 min, at 57℃ for 1 min, and at 72℃ for 10 s followed by 34 cycles at 95℃ for 1 min, at 57℃ for 30 s, and at 72℃ for 10 s. The sequences of primer used are sense: 5'-CAGATGAAGCTCCCAGAA-3' (upstream) and anti-sense: 5'-GTGTAGGAGCTGCTGGTG-3' (downstream). An amplicon of 66 bp was produced, which was cleaved into 29 bp and 37 bp fragments with the enzyme BstU1, if its recognition site (CGCG) was present. The primer amplified a region containing codon 72 in exon 4 of *p53*[10,11]. Mutation of the *p53* gene was only observed in dedifferentiated tumor tissue samples but not in well-differentiated tumor tissue samples (Figure 3).

DISCUSSION

Mutation or allelic deletion of *p53* gene appears to play an important role in the development of human carcinoma[12]. It has been established that accumulation of wild type *p53* protein results in two pathways: cell cycle arrest and programmed cell death, both of which are involved in tumor suppressor functions[13]. Therefore, mutation of *p53* leads to disruption of these pathways, a selective growth advantage for tumor cells, and loss of function may increase proliferation activity and development of tumor[14].

Liposarcoma arising in extremities or retroperitoneum affects middle-aged and old patients, and tend to follow a relatively indolent clinical course with local recurrences after resection and occasional distant metastasis, mainly to the lungs[1]. Dedifferentiated liposarcoma is defined histologically by a transition from well-differentiated liposarcoma to a non-lipogenic sarcoma with variable histological grade[1]. The dedifferentiated tumor can resemble any sarcoma, but often mimics a malignant fibrous histiocytoma (MFH)[9].

Dedifferentiated liposarcoma, despite its high-grade histology, has a less aggressive clinical course than other

types of high grade sarcoma, although the underlying mechanism is unclear[1]. Compared to well-differentiated liposarcoma, dedifferentiated liposarcoma has similar genetic changes, ring or giant marker chromosomes, but a worse prognosis[1]. Approximately 40% of dedifferentiated liposarcomas will recur locally, 17% will metastasize, and 28% of the patients will ultimately die as a result of tumor[1].

It was reported that dedifferentiated liposarcoma occurs most commonly in retroperitoneum but rarely in other anatomic locations[9]. Five cases of dedifferentiated liposarcoma in small bowel mesentery have been described[15]. In addition, a case of dedifferentiated liposarcoma has been documented in the sigmoid mesocolon[16]. The present tumor, located at intraperitoneum.

Immunohistochemically, dedifferentiated liposarcoma is usually negative for CD117 and CD34 in dedifferentiated tissue and positive for S100 protein in well-differentiated tissue. Dedifferentiated liposarcoma needs to be distinguished from other high-grade sarcomas such as MFH because these high-grade sarcomas have a much worse prognosis[17].

We investigated the exon 4 of *p53* gene in adipose tissue tumor by PCR observed mutation of *p53* gene in dedifferentiated liposarcoma samples. Similarly, Taubert *et al*[4] detected mutations of *p53* gene in 5/32 of liposarcomas. It was reported that wild type p53 protein can induce cell apoptosis, whereas intracellular accumulation of mutant p53 protein can inhibit cell apoptosis, promote cell transformation and proliferation, resulting in carcinogenesis[5,14].

The patient underwent adjuvant radiation therapy and was asymptomatic during the 15-mo follow-up period. However, because the recurrence rate of dedifferentiated liposarcoma is very high, it is necessary to follow up carefully for a long term.

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