

Primary retroperitoneal myxoid/round cell liposarcoma is a nonexisting disease: an immunohistochemical and molecular biological analysis

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Almost all primary retroperitoneal liposarcomas can be classified as well-/dedifferentiated liposarcoma. Rarely, however, primary retroperitoneal liposarcoma is classified as myxoid/round cell liposarcoma, based on the presence of myxoid areas and vascular crow's feet pattern, which has resulted in a debate on the classification of liposarcoma in the retroperitoneum. Genetically, myxoid/round cell liposarcoma and well-/dedifferentiated liposarcoma are different diseases. Myxoid/round cell liposarcoma is characterized by a translocation causing *FUS-CHOP* or *EWSR1-CHOP* fusion, whereas well-/dedifferentiated liposarcoma is characterized by an amplification of the 12q13-15 region, including *MDM2* and *CDK4* genes. As myxoid/round cell liposarcoma is highly radio- and chemosensitive, differentiation between subtypes is important to optimize treatment. We studied whether primary retroperitoneal liposarcomas diagnosed as myxoid/round cell liposarcoma represent molecularly true myxoid/round cell liposarcoma or are histopathological mimics and represent well-/dedifferentiated liposarcoma. Primary retroperitoneal myxoid/round cell liposarcoma ($n=16$) were compared to primary extremity myxoid/round cell liposarcoma ($n=20$). Histopathological and immunohistochemical features were studied. Amplification status of the 12q13-15 region was studied using a multiplex ligation-dependent probe amplification analysis, and *FUS-CHOP* or *EWS-CHOP* translocations were studied using RT-PCR. In primary retroperitoneal myxoid/round cell liposarcoma, *MDM2* and *CDK4* staining was both positive in 12 of 15 cases. In primary extremity myxoid/round cell liposarcoma, *MDM2* was negative in 18/20 and *CDK4* was negative in all cases. Multiplex ligation-dependent probe amplification showed the amplification of 12q13-15 region in 16/16 primary retroperitoneal myxoid/round cell liposarcomas and in 1/20 primary extremity myxoid/round cell liposarcomas. Translocation was present in all (18/18) primary extremity myxoid/round cell liposarcomas, but absent in all primary retroperitoneal myxoid/round cell liposarcomas. On the basis of immunohistochemical and molecular characteristics, apparent primary retroperitoneal myxoid/round cell liposarcoma can be recognized as well-/dedifferentiated liposarcoma with morphological features mimicking myxoid/round cell liposarcoma. In these cases, treatment should probably be specifically designed as for well-/dedifferentiated liposarcoma. Moreover, finding of myxoid/round cell liposarcoma translocations in a retroperitoneal localization is highly suggestive of metastasis and should prompt search for a primary localization outside the retroperitoneum.

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Liposarcomas are a rare type of malignancy with a very heterogeneous morphological appearance and clinical course. The therapeutic approach is based on histopathological classification and is dependent on primary localization.

Liposarcoma occurs in four main histopathological classes that are characterized by a distinct

morphological spectrum and clear molecular features. The first class of well differentiated liposarcoma includes lipoma-like, sclerosing, inflammatory and spindle cell subtypes. The second class of dedifferentiated liposarcoma occurs in up to 10% of well differentiated liposarcoma of any type and has a more aggressive course. The third class consists of myxoid liposarcoma of which a proportion of cases progresses to round cell liposarcoma, and the last class encompasses the often poorly differentiated pleomorphic liposarcoma.^{1,2}

The anatomic distribution of liposarcoma appears to be closely related to histological subtype. myxoid/round cell liposarcoma and pleomorphic liposarcoma have a predilection for the extremities, whereas well-/dedifferentiated liposarcomas occur predominantly in the retroperitoneum.

In retroperitoneal tumors, apart from the more generally found morphological features of lipoma-like, sclerosing or dedifferentiated liposarcoma, also components resembling myxoid/round cell liposarcoma are incidentally found. On the basis of histological appearance with myxoid areas and vascular crow's feet pattern (Figure 1), 5% of primary retroperitoneal liposarcomas are reported as myxoid or round cell liposarcoma.³

From a molecular point of view, myxoid/round cell liposarcoma and well-/dedifferentiated liposarcoma are different entities. In more than 95% of

myxoid/round cell liposarcoma, a classical t(12;16) (q13;p11) or t(12;22) (q13;q12) translocation can be found, with a *FUS-CHOP* or *EWSR1-CHOP* gene fusion, respectively. Characteristic genetic alteration for well-/dedifferentiated liposarcoma is the amplification of the 12q13-15 region, which, among many other genes, includes *MDM2* and *CDK4*.⁴⁻⁷ Both alterations seem to be mutually exclusive and distinctive for their disease classes.

Myxoid/round cell liposarcoma is highly radio- and chemosensitive,⁸⁻¹⁰ and differentiation between the subtypes of liposarcoma is important to indicate prognosis, and especially to tailor treatment. Myxoid/round cell liposarcoma has several mimics, including myxoid chondrosarcoma, myxoid malignant fibrous histiocytoma (myxofibrosarcoma), and in selected situations, also well-/dedifferentiated liposarcoma. The latter problem is mostly encountered when edematous and degenerative changes are present and has specifically resulted in a debate between specialists on the classification of liposarcoma in the retroperitoneum and confusion among the interested pathologists.

We studied whether primary retroperitoneal liposarcomas diagnosed as myxoid/round cell liposarcoma represent molecularly true myxoid/round cell liposarcoma or are rather histopathological mimics, and actually represent well-/dedifferentiated liposarcoma with myxoid-like changes.

Materials and methods

Patient Selection

From all primary retroperitoneal liposarcomas diagnosed in The Netherlands Cancer Institute between 1977 and 2006 ($n=68$), 16 patients were classified as myxoid/round cell liposarcoma. All cases were reviewed according to the criteria of the most recent WHO classification, and the presence of >80% of myxoid areas and micro crow's feet vasculature was confirmed.¹¹ Cases were considered as primary retroperitoneal lesions in case of retroperitoneal soft tissue monolocalization with or without the evidence of pulmonary metastasis. In case of one or more additional synchronous soft tissue localizations, retroperitoneal liposarcoma was considered only primary, if this would be the dominant lesion. No such cases, however, were identified in this series. At least 10 tumor blocks were reviewed per tumor. As a control group, 20 cases of myxoid/round cell liposarcoma with a primary localization in the extremities, and diagnosed in the same period, were selected. Detailed patient and tumor characteristics of both groups are shown in Table 1.

Immunohistochemical Analysis of *MDM2* and *CDK4*

Tissue microarrays were constructed according to standard methods using triplicate 1 mm cores of representative areas of each tumor. Appropriate

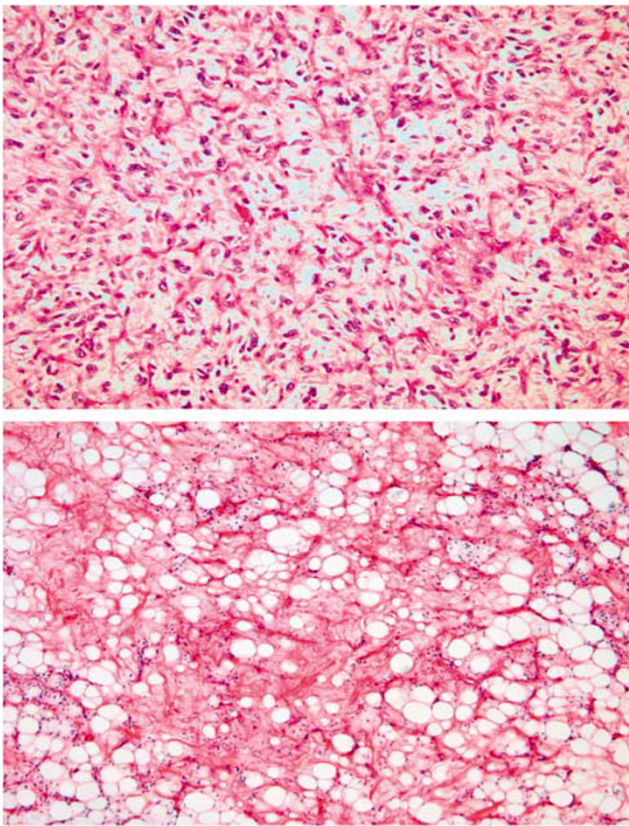


Figure 1 Histology of primary retroperitoneal (upper) and primary extremity (lower) myxoid/round cell liposarcoma.

coordinates and staining controls were included. Immunohistochemical staining for *MDM2* and *CDK4* was performed according to standard methods. In brief, after a pretreatment of citrate-based microwave antigen retrieval, the sections were incubated with the following antibodies overnight at 4°C: anti-*MDM2* antibody (dilution 1/3000; BD Biosciences, Erembodegem, Belgium) and anti-*CDK4* antibody

(dilution 1/1500; Thermo Fisher Scientific, Fremont, CA, USA) and visualized with diaminobenzidine. The percentage of tumor cells with nuclear staining was assessed semiquantitatively and averaged for the triplet cores per patient. Staining intensity was ranked in four levels (Tables 2 and 3 and Figure 2). Immunohistochemical stainings on tissue microarray were scored by two

Table 1 Patient and tumor characteristics

Patient characteristics	Primary retroperitoneal liposarcoma	Primary extremity liposarcoma
Male/female	9/7	12/8
Median age at diagnose, years (range)	50 (31–80)	43(26–70)
<i>Therapy for primary tumor</i>		
Surgery	16	20
Radiotherapy	1	17
Chemotherapy	2	3
<i>Tumor characteristics</i>		
Site primary tumor (retroperitoneum/extremity)	16/0	0/20
Grade (intermediate/high)	12/4	12/8
Mean primary tumor size, cm (range)	23 (13–35)	14 (4–30)
<i>Follow-up</i>		
Mean follow-up months (range)	185 (1–352)	74 (18–192)
Local recurrence	7	4
Lung metastasis	1	5

Table 2 Immunohistochemical and translocation results

	Primary retroperitoneal liposarcoma	Primary extremity liposarcoma
<i>Immunohistochemical analysis MDM2</i>		
Negative	0	18
Very weak	2	0
Weak	1	2
Positive	12	0
<i>Immunohistochemical analysis CDK4</i>		
Negative	1	20
Very weak	0	0
Weak	2	0
Positive	12	0
<i>Translocation</i>		
(12–16) (<i>FUS-CHOP</i>)	0/16 (0%)	18/18 (100%)
(12–22) (<i>EWS-CHOP</i>)	0/16 (0%)	0/18 (0%)
<i>MLPA</i>		
<i>MDM2</i> amplification	16/16 (100%)	1/20 (5%)
<i>CDK4</i> amplification	15/16 (94%)	0/20 (0%)

Table 3 Immunohistochemical and the multiplex ligation-dependant probe amplification results of primary retroperitoneal patients

Primary retroperitoneal liposarcoma	Immunohistochemisrty		Multiplex ligation-dependant probe amplification				
	<i>CDK4</i> analysis	<i>MDM2</i> analysis	<i>CDK4</i> 12q14	<i>CDK4^a</i> 12q14	<i>IFNG</i> 12q14	<i>MDM2</i> 12q14.3	<i>MDM2^a</i> 12q14.3
1	Positive	Positive	13.96	12.74	2.98	57.59	77.58
2	Positive	Positive	21.38	27.21	2.26	45.25	56.71
3	Positive	Positive	16.46	17.38	3.68	37.89	28.83
4	Positive	Positive	29.63	35.50	13.94	30.51	45.14
5	Positive	Positive	14.38	16.87	2.30	29.90	41.89
6	Positive	Positive	15.97	17.42	23.00	29.84	33.71
7	Positive	Weak	15.46	14.99	17.46	29.26	39.33
8	Positive	Positive	19.06	26.87	2.73	27.57	18.42
9	Weak	Positive	14.38	12.19	2.27	21.60	22.26
10	NA	NA	11.93	11.70	1.85	20.72	26.20
11	Positive	Positive	15.24	12.85	13.81	18.19	21.98
12	Positive	Positive	17.20	24.13	1.84	15.31	25.07
13	Positive	Very weak	19.47	22.39	2.62	6.86	10.47
14	Positive	Positive	17.39	20.58	9.44	6.70	16.67
15	Negative	Very weak	2.91	2.05	2.80	6.10	7.90
16	Weak	Positive	3.53	5.37	3.00	3.46	4.00

NA, not available (cell lysis).

In the multiplex ligation-dependant probe amplification column, the gene copy number results per patient of five probes covering three genes, all located on the 12q13–15 region, are shown.

Gray areas signify the amplified.

^aA second probe at a different localization on a similar gene.

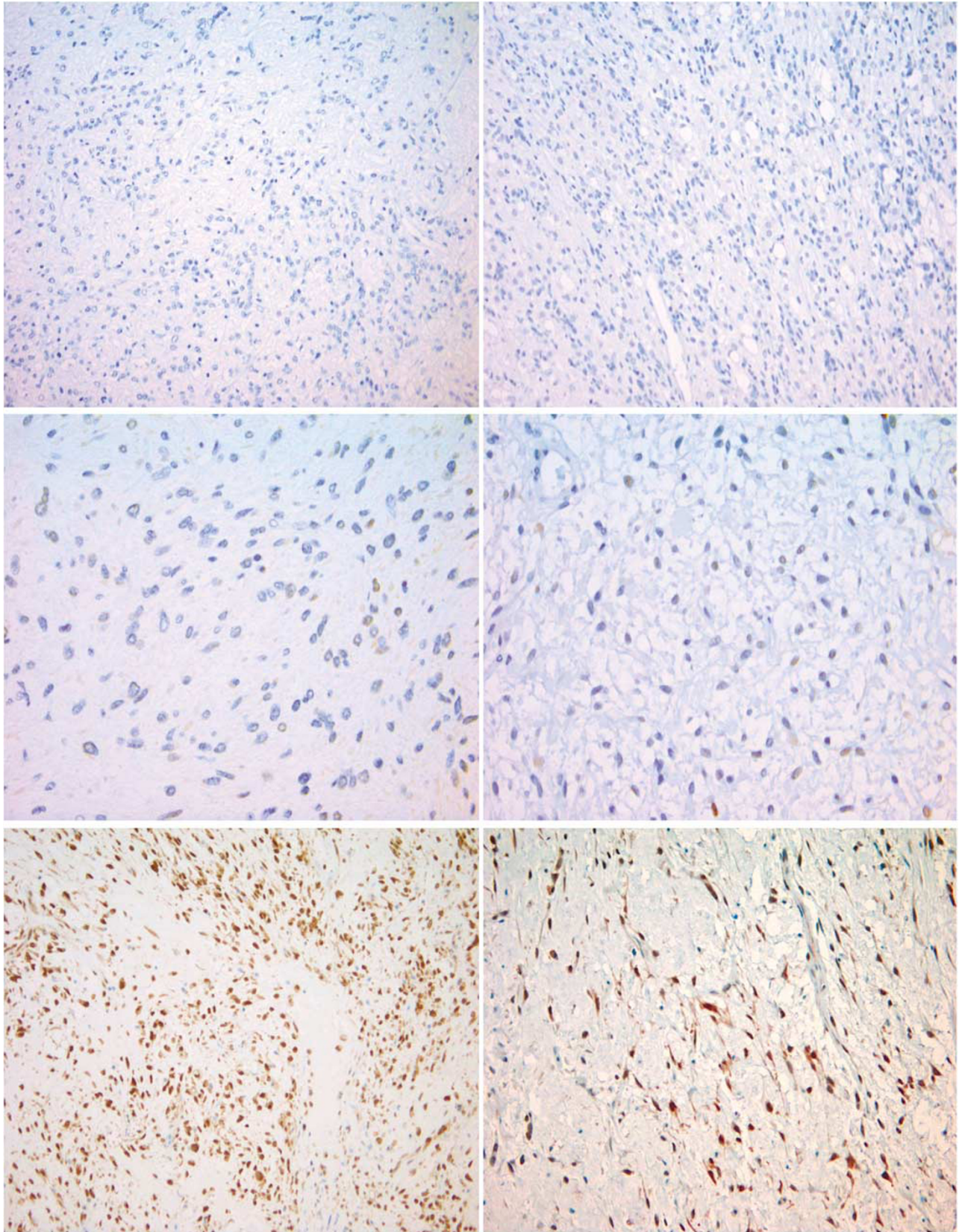


Figure 2 Staining intensities for *CDK4* (left) and *MDM2* (right). The upper two are negative, the middle two are weak and the lower two are considered positive staining.

observers (DdJ and RdV). In cases of discrepancies or equivocal interpretations, consensus was obtained at the multiheaded microscope. If needed, immunohistochemistry was performed on full sections of the tumor and compared with TMA results.

Detection of *FUS-CHOP* and *EWSR1-CHOP* Fusion Gene

RNA was extracted from representative sections of the formalin-fixed, paraffin-embedded specimens according to the manufacturer's method using high pure RNA paraffin kit (Roche, Basel, Switzerland).¹² Microdissection to optimize tumor cell content was performed, if necessary. RNA concentration was measured using a nanodrop spectrophotometer. RT-PCR amplification was performed using one-step RT-PCR. Because of the limiting quality of RNA from formalin-fixed, paraffin-embedded material, different breakpoints were detected, using a combination of *FUS-CHOP* and *EWSR1-CHOP*-specific internal primers, resulting in small PCR products (Table 4). PCR cycles were operated on a regimen of 30 s of denaturation at 95°C, 30 s of primer annealing at 68°C, and 30 s extension/synthesis at 72°C for 30 cycles. PCR products were separated by electrophoresis on 2.5% agarose gels containing ethidium bromide, visualized by UV light and photographed. To confirm the type of fusion gene, PCR products were compared with positive controls of the different fusion gene combinations as confirmed by sequencing.

Molecular Analysis by Multiplex Ligation-Dependant Probe Amplification

The recently described multiplex ligation-dependant probe amplification technique¹³ is a high throughput, PCR-based, method to determine the relative copy number of various DNA sequences in small samples of human DNA. It is based on the annealing of a mixture of hemiprobe on their

cognate DNA sequences. One of the hemiprobe contains stuffer DNA of variable length (19–370 bp), which allows multiplex detection using capillary sequencer.

The SALSA- multiplex ligation-dependant probe amplification kits, P007 and P172 tests, were developed and manufactured by MRC-Holland. The preparation and sequences of the probes have been described elsewhere.¹³ In short, 200 ng target DNA/5 µl of 10 mM Tris (pH8)-0,1 mM EDTA was denaturated for 5 min at 98°C after which 3 µl of the probe mix was added. The mixture was heated at 95°C for 1 min and incubated at 60°C overnight (16 h). Ligation was performed with the temperature-stable ligase-65 enzyme (MRC-Holland) for 15 min at 54°C. Then, the ligase was inactivated by incubation for 5 min at 98°C. In all, 10 µl of this ligation mix was premixed with 30 µl of PCR buffer and put in a PCR machine at 60°C. Subsequently, a 10 µl mix was added containing deoxynucleoside triphosphate, Taq polymerase, and one unlabeled and one carboxyfluorescein-labeled PCR primer, which are complementary to the universal primer sequences. PCR was carried out for 35 cycles (30 s at 95°C, 30 s at 60°C, and 60 s at 72°C). The fragments were analyzed on an ABI model 310 or 3700 capillary sequencer (Applied Biosystems) using Genescan-ROX 500 size standards (Applied Biosystems). Fragment analysis was performed using Genescan and Genotyper software, amplifications or deletions were calculated and evaluated, compared to 15 samples DNA from normal tissues. After normalization, each probe set was scored as 0.01–1.00 deleted, 1.01–2.99 normal copy number, 3.00–3.99 copy number gain, and finally ≥4.00 amplification.

Results

Detailed clinical and tumor features of both groups are shown in Table 1. Sixteen patients (seven female and nine male) were diagnosed with primary retro-

Table 4 Primers used for translocation detection in paraffin-embedded specimens

Primer name	F/R	Sequence
2202-CHOPex2parR	R	5'-TGCTTTCAGGTGTGGTAGATG-3'
2204-CHOPex5parF	F	5'-AGGGCTATGGACAGCAGAAC-3'
2206-FUSex8parF	F	5'-CCGTGGTGGCTTCAATAAAT-3'
2239-CHOP3R	R	5'-CCATCTCTGCAGTTGGATCA-3'
2243-CHOPex3R	R	5'-TGGATCAGTCTGGAAAAGCA-3'
2082-EWSex7par-F	F	5'-TCCTACAGCCAAGCTCCAAGTC-3'
Breakpoint	Primer combination	Suspected product length
7-FUS/2-CHOP	2206/2202	73 bp
5-FUS/2-CHOP	2204/2239	138 bp
8-FUS/2-CHOP	2206/2202	106 bp
5-FUS/3-CHOP	2204/2239	90 bp
7-EWS/2-CHOP	2082/2202	105 bp
7-EWS/3-CHOP	2082/2243	81 bp

peritoneal myxoid/round cell liposarcoma and 20 (eight female and 12 male) with primary extremity myxoid/round cell liposarcoma.

Median tumor diameter at histology was 23 cm (13–35) in the retroperitoneal group and 14 cm (4–30) in the extremity group. Most tumors were intermediate grade ($n = 24$), the remaining sarcomas were high grade ($n = 12$). Most extremity tumors were resected, followed by radiotherapy indicated by often inevitable narrow margins of resection. Radiation therapy in retroperitoneal tumors has been applied in this study period only in selected cases.

Immunohistochemical Analysis of *MDM2* And *CDK4*

Detailed immunohistochemical results and examples can be found in Tables 2 and 3 and Figure 2. Immunohistochemical analysis was interpretable in 35 of 36 (97%) cases. Semiquantitative analysis of primary retroperitoneal myxoid/round cell liposarcoma patients by immunohistochemical detection of *MDM2* staining showed in 12 of 15 (80%) patients a well-defined positive staining, whereas one patient showed weak staining and two patients (13%) showed a very weak staining. Positive staining of *CDK4* was seen in 12 of 15 (80%) patients; two (13%) patients showed weak staining and one was negative in the retroperitoneal group.

In the primary extremity myxoid/round cell liposarcoma group, 18 of 20 (90%) patients were negative for *MDM2*, and two cases (10%) showed weak staining. All primary extremity myxoid/round cell liposarcoma cases were negative for immunohistochemical staining of *CDK4*.

Detection of *FUS-CHOP* and *EWSR1-CHOP* Fusion Gene

No *FUS-CHOP* and *EWSR1-CHOP* translocations were found in any primary retroperitoneal myxoid/round cell liposarcoma. In 18 of 20 extremity myxoid/round cell liposarcoma, a *FUS-CHOP* translocation was found. In two cases, extracted RNA was of insufficient quality, precluding analysis.

Amplification of 12q13-15 by Multiplex Ligation-Dependant Probe Amplification Analysis

All patients in both groups could be studied with molecular multiplex ligation-dependant probe amplification analysis; see Supplementary data, Table 3 and Figure 3. Both the multiplex ligation-dependant probe amplification kits, which were used, were interpreted after calculation of visualized peak surface area on an electropherogram,¹³ and normalized to the results of 15 samples' normal reference tissues, assuming two copies for each

target probe. Amplification was defined as four target sequence copies or more.

In all, 5 of the 79 probes targeted the 12q13-15 region, a single *IFNG* probe and two different probes on the *CDK4* and *MDM2* gene. Amplification of the *CDK4* gene was found in 15 of 16 (94%) and amplification of the *MDM2* gene was found in 16 of 16 (100%) primary retroperitoneal myxoid/round cell liposarcoma patients, and the amplification of the *IFNG* gene was found in five cases (31%). Although the *IFNG* gene is supposed to be situated in between *CDK4* and *MDM2*, these results, which could implicate two different amplicons, are in accordance with the results reported by others.^{14–16}

Multiplex ligation-dependant probe amplification of the primary extremity myxoid/round cell liposarcoma group showed, in 1 of 20 (5%) patients, an amplification (4.38) in one of the five probes targeting the 12q13-15 region.

Chromosomal Gains And Losses of Other Regions As Detected with Multiplex Ligation-Dependant Probe Amplification

Using multiplex ligation-dependant probe amplification, 74 additional chromosomal regions were screened for amplification. In the primary retroperitoneal myxoid/round cell liposarcoma group, additional amplifications of the *TNFRNF1B* gene located on chromosome 1p36.3 was found in four patients; the *TERT* gene located on chromosome 5p25 showed amplification in five patients; the *MYC* gene located on chromosome 8q24 showed amplification in two patients, and *CCND2* on 12p13 showed amplification in three patients. Furthermore, single amplifications of *SLA*, *PTK2*, *TINF2*, *NFKBIA*, *SCYA3*, *B2M*, *MOS*, *GSTP1*, *PTPN1*, *AURKA*, *BIRC4*, and *TFF1* genes were found. Some of these changes have been correlated to lipomatous tumors by others previously.¹⁷

Deletions were found in 40 of 1264 samples (ranged 0.56–0.100) of primary retroperitoneal myxoid/round cell liposarcoma patients and in 10 of 1580 samples (ranged 0.22–0.98) of primary extremity myxoid/round cell liposarcoma patients.

By using a Pearson test, positive correlations were found comparing staining intensities of *CDK4* and *MDM2* to multiplex ligation-dependant probe amplification results (*CDK4*: +0,420, $p0,021$; *MDM2*: +0,386, $p0,035$), which can be seen in Table 3 where the level of staining in a majority of cases reflects the level of DNA copy number of *MDM2* and *CDK4* found by multiplex ligation-dependant probe amplification.

Discussion

This study shows that cases of primary retroperitoneal liposarcoma with morphological features suggestive of myxoid/round cell liposarcoma actually

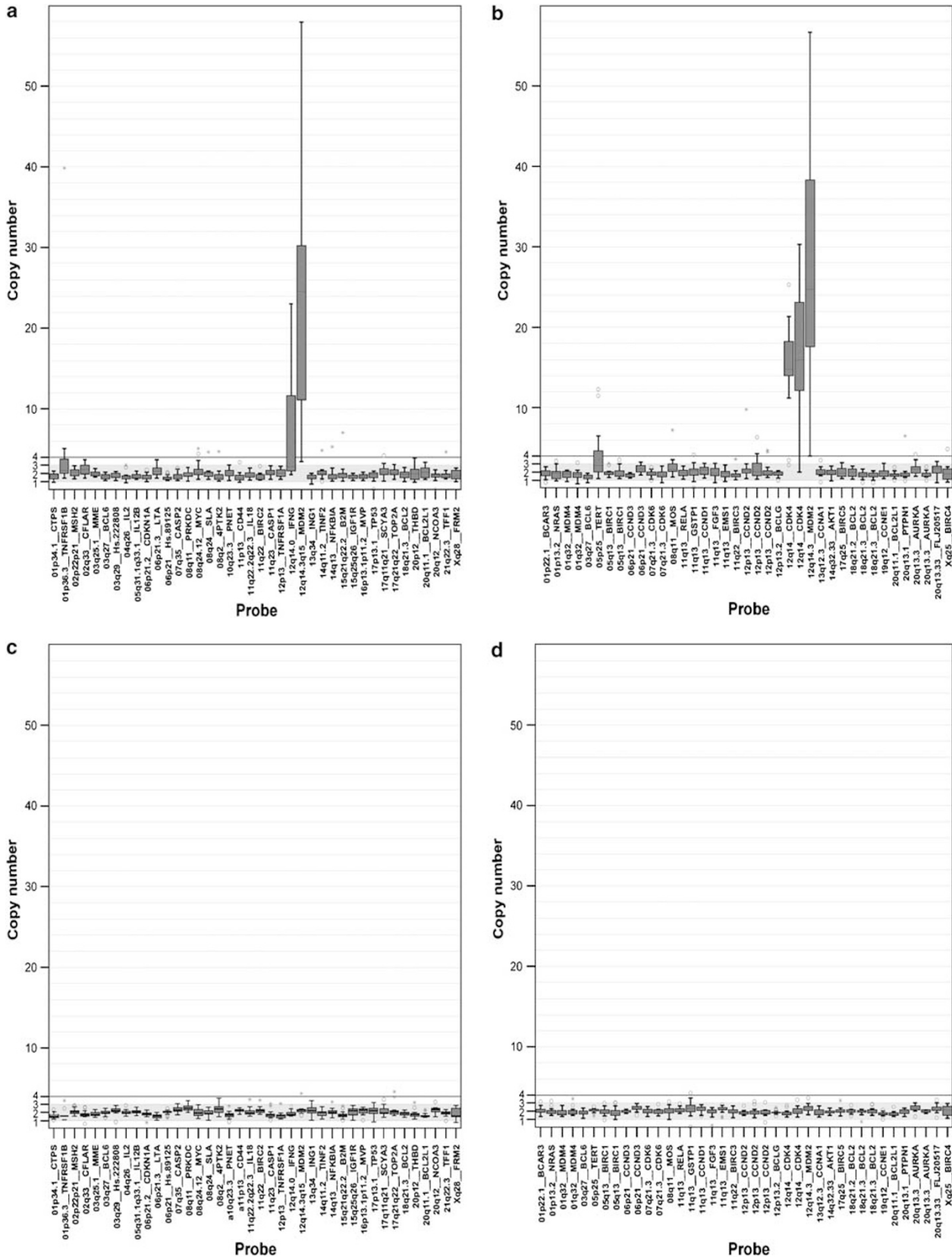


Figure 3 (a and b) Multiplex ligation-dependent probe amplification results of 79 marker genes in 16 retroperitoneal lesions show amplification of region 12q13-15. (c and d) Multiplex ligation-dependent probe amplification results of 79 marker genes in 20 extremity lesions. The threshold level of amplification is set at 4, the region of normal diploid copy numbers is highlighted in gray.

represent well-/dedifferentiated liposarcoma on the basis of immunohistochemical and molecular features. Most importantly, the myxoid/round cell liposarcoma-defining and characteristic *FUS-CHOP* or *EWSR1-CHOP* translocation was not found, but amplification of 12q13-15 including *MDM2* and *CDK4* was found in all cases. Therefore, this study shows that the histomorphological appearance does not always and necessarily reflect the genetic basis.

The classification difficulties are mostly encountered when edematous and degenerative changes are present which has specifically resulted in a debate on the classification of liposarcoma in the retroperitoneum between specialists and confusion among the interested pathologists. Most importantly, the clinical relevance of the distinction of both subtypes of liposarcoma lies in the fact that myxoid/round cell liposarcoma is highly radio- and chemosensitive.⁸⁻¹⁰ Therefore, differentiation between subtypes of liposarcoma is important to indicate the prognosis and choose the appropriate treatment. Surgery is the standard therapy for sarcoma, including liposarcoma. Resection of retroperitoneal liposarcomas continues to be a challenge for the surgeon, in particular given their large size and often central location with involvement of vital structures and organs. Histological grade of a retroperitoneal (lipo) sarcoma and its complete resection remain the most important predictors for local recurrence and overall survival.^{3,18,19} As in our institute, intermediate or high-grade sarcomas are, if feasible, treated by surgery combined with (neo)adjuvant radiotherapy, whereas low-grade well-/dedifferentiated liposarcomas are treated by resection only.²⁰

Chemotherapy sensitivity varies considerably between liposarcoma subtypes, with a significant higher response rate to the first-line chemotherapy in myxoid/round cell liposarcoma as compared to well-/dedifferentiated liposarcoma (48 vs 11%).¹⁰ These reports are emphasizing the need for adequate staging and classification of the liposarcoma subtype to choose the most appropriate treatment. In primary retroperitoneal myxoid/round cell liposarcoma, immunohistochemical or molecular analysis on (biopsy) specimens can support or reject the morphologic classification, and should therefore be considered in case of doubt.

Now, the existence of true primary myxoid/round cell liposarcoma in the retroperitoneum can be strongly doubted. Reports of genetically proven classic myxoid/round cell liposarcoma in the retroperitoneum should be interpreted in a different way.^{9,21-23} All reported myxoid/round cell liposarcoma patients with retroperitoneal localizations showed multiple localizations, of which the retroperitoneum was the second or latter localization. Indeed, in our and in other series, the retroperitoneum is one of the most common sites of second localization of myxoid/round cell liposarcoma.²⁴ Therefore, the importance of searching for a primary

tumor must be emphasized, when diagnosing a classic myxoid/round cell liposarcoma in the retroperitoneum on molecular biologic grounds as the first presentation of malignancy.

As in approximately 95% of myxoid/round cell liposarcoma cases, a specific *FUS-CHOP* or *EWSR1-CHOP* translocation can be found; a negative translocation analysis does not always exclude myxoid/round cell liposarcoma. To positively establish the well-/dedifferentiated liposarcoma character of a primary retroperitoneal liposarcoma, various methods can be used. Here, we used multiplex ligation-dependant probe amplification combined with immunohistochemical analysis, which can lead to an undisputable diagnosis, showing that the combination of diagnostic tools can be useful to unravel its biologic basis. PCR-based assays, either custom made and specifically targeted to the 12q region or a broader targeted commercially available, such as multiplex ligation-dependant probe amplification may be appropriate. Our study shows that PCR-based methods, such as multiplex ligation-dependant probe amplification was evaluative in all tested samples and may be more sensitive than immunohistochemistry for *MDM2* and/or *CDK4*, but is relatively costly and labor intense, and may be reserved for ambiguous cases in daily practice. Alternatively, the amplification status of the 12q13-15 region can be assessed using fluorescence *in situ* hybridization techniques, which have also been shown to be a highly sensitive and specific method, but is sometimes very difficult to interpret in cases with necrosis, low tumor cell percentages or poor tissue preservation.

Conclusion

This study shows that myxoid/round cell liposarcoma histopathologic appearance in primary retroperitoneal liposarcoma can be explained by the presence of focal myxoid-like changes in well-/dedifferentiated liposarcoma and that the multiple diagnostic tests on primary retroperitoneal liposarcomas can corroborate to a specific diagnosis on which an appropriate treatment can be based. In addition, finding of myxoid/round cell liposarcoma translocations in a retroperitoneal localization is highly suggestive of metastasis and should prompt the search for a primary localization outside the retroperitoneum.^{25,26}

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Disclosure/conflict of interest

No conflict of interest and sources of support in connection with this work are present.

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