Table S1. Several properties of the acquisition protocols of the 116 T1-weighted MRI sequences of patients with lipoma or well-differentiated liposarcoma (WDLPS) that were used to build the radiomics model.

Property		**N**	**%**	
Magnetic field strength				
1T		10	9.6	
1.5T		98	84.5	
3T		8	6.9	
Manufacturer				
Siemens		45	38.8	
Philips		45	38.8	
GE		26	22.4	
Setting (Unit)	**Mean**	**Std.**	**Min.**	**Max.**
Slice Thickness (mm)	4.77	1.14	2.5	10.0
Repetition time (ms)	555	108	280	831
Echo time (ms)	13.2	4.3	5.7	37
Available MRI sequences		**N**	**%**	
T1		116	100	
T1-FS		55	47.4	
T1-GD		42	36.2	
T1-FS-GD		80	69.0	
T2		76	65.5	
T2-FS		92	79.3	

Std.: standard deviation, min.: minimum value, max.: maximum value, mm: millimeters, ms: milliseconds, FS: Fat Saturation, GD: gadolinium contrast.

Table S2. Performance of the radiomics models based on T1 imaging features only; patient features only; manually scored features only; the combination of T1 imaging and manually scored features; and of volume only on the full dataset. Performance for the radiomics models is reported for each experiment as mean [95% confidence interval] over the cross-validation iterations.

	Model 1 T1 imaging features	**Model 2** Patient features	**Model 3** Manually scored features	**Model 4** T1 imaging + manually scored features	**Model 5** Volume
AUC	**0.83** [0.75, 0.90]	**0.75** [0.64, 0.85]	**0.72** [0.62, 0.81]	**0.69** [0.58, 0.79]	**0.83** [0.75, 0.91]
Accuracy	**0.68** [0.67, 0.84]	**0.68** [0.59, 0.76]	**0.67** [0.57, 0.76]	**0.61** [0.51, 0.70]	**0.76** [0.67, 0.84]
Sensitivity	**0.68** [0.53, 0.82]	**0.77** [0.63, 0.90]	**0.76** [0.58, 0.94]	**0.53** [0.37, 0.68]	**0.67** [0.52, 0.81]
Specificity	**0.84** [0.72, 0.95]	**0.59** [0.45, 0.72]	**0.57** [0.43, 0.71]	**0.69** [0.54, 0.84]	**0.84** [0.71, 0.97]
NPV	**0.73** [0.63, 0.82]	**0.73** [0.61, 0.85]	**0.73** [0.59, 0.86]	**0.60** [0.50, 0.69]	**0.75** [0.66, 0.83]
PPV	**0.82** [0.70, 0.93]	**0.66** [0.58, 0.73]	**0.64** [0.54, 0.74]	**0.64** [0.51, 0.76]	**0.81** [0.69, 0.93]

AUC: area under the curve, NPV: negative predictive value, PPV: positive predictive value

Table S3. Performance of radiomics models trained on features extracted from various MRI sequences on the full dataset. Performance is reported as mean [95% confidence interval] over the cross-validation iterations.

	T1	T1 + T1-FS	T1 + T1-GD	T1 + T1-FS-GD	T1 + T2	T1 + T2-FS
AUC	**0.83** [0.75, 0.90]	**0.84** [0.75, 0.92]	**0.81** [0.72, 0.90]	**0.81** [0.73, 0.89]	**0.89** [0.83, 0.95]	**0.81** [0.73, 0.88]
Accuracy	**0.68** [0.67, 0.84]	**0.77** [0.69, 0.85]	**0.76** [0.67, 0.84]	**0.75** [0.66, 0.83]	**0.81** [0.74, 0.87]	**0.74** [0.66, 0.81]
Sensitivity	**0.68** [0.53, 0.82]	**0.69** [0.56, 0.82]	**0.69** [0.56, 0.82]	**0.66** [0.51, 0.81]	**0.74** [0.61, 0.86]	**0.66** [0.53, 0.79]
Specificity	**0.84** [0.72, 0.95]	**0.84** [0.73, 0.95]	**0.77** [0.71, 0.83]	**0.84** [0.72, 0.95]	**0.88** [0.78, 0.98]	**0.82** [0.70, 0.93]
NPV	**0.73** [0.63, 0.82]	**0.74** [0.65, 0.82]	**0.73** [0.64, 0.82]	**0.72** [0.63, 0.81]	**0.78** [0.69, 0.86]	**0.72** [0.63, 0.80]
PPV	**0.82** [0.70, 0.93]	**0.83** [0.72, 0.93]	**0.80** [0.69, 0.91]	**0.81** [0.69, 0.93]	**0.88** [0.78, 0.97]	**0.79** [0.68, 0.90]

AUC: area under the curve, NPV: negative predictive value, PPV: positive predictive value, FS: Fat Saturation, GD: gadolinium contrast

Table S4. Performance of the three radiologists in differentiating between well-differentiated liposarcomas and lipomas on both the full and volume-matched cohort, and in differentiating dedifferentiated liposarcoma (DDLPS) and non-DDLPS (well-differentiated liposarcoma [WDLPS]/lipomas).

	Full cohort			**Volume-matched cohort**			**DDLPS vs. non-DDLPS**		
	Rad. 1	Rad. 2	Rad.3	Rad. 1	Rad. 2	Rad. 3	Rad. 1	Rad. 2	Rad. 3
AUC	**0.74**	**0.72**	**0.61**	**0.68**	**0.74**	**0.55**	**0.97**	**0.91**	**0.90**
Accuracy	**0.64**	**0.64**	**0.61**	**0.62**	**0.63**	**0.55**	**0.95**	**0.62**	**0.89**
Sensitivity	**0.74**	**0.91**	**0.64**	**0.65**	**0.88**	**0.60**	**0.95**	**0.95**	**0.91**
Specificity	**0.55**	**0.36**	**0.59**	**0.58**	**0.37**	**0.50**	**0.95**	**0.56**	**0.89**
NPV	**0.68**	**0.81**	**0.62**	**0.61**	**0.74**	**0.54**	**0.99**	**0.98**	**0.98**
PPV	**0.62**	**0.59**	**0.61**	**0.62**	**0.59**	**0.56**	**0.78**	**0.29**	**0.61**

AUC: area under the curve, NPV: negative predictive value, PPV: positive predictive value, rad.: radiologist