Quantified diffusion-weighted MR imaging response assessment in rhabdomyosarcoma: an international retrospective study on behalf of the EpSSG Imaging Committee

Supplemental file

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Suppl. table 1. DW-MRI acquisition characteristics for the excluded and included cohort

	Excluded	Included
Manufacturer		
GE	7 (6.7%)	16 (9.8%)
Philips	44 (42.3%)	73 (44.5%)
Siemens	34 (32.7%)	75 (45.7%)
Not available	19 (18.3%)	0 (0%)
Slice thickness (mm)		
Mean (SD)	4.26 (1.05)	4.32 (0.939)
Median [Min, Max]	4.00 [2.00, 7.00]	4.25 [2.00, 7.00]
Not available	19 (18.3%)	0 (0%)
Number of B values		
Mean (SD)	2.79 (1.27)	2.99 (1.63)
Median [Min, Max]	2.00 [2.00, 10.0]	2.00 [2.00, 10.0]
Not available	22 (21.2%)	2 (1.2%)
Pixel spacing (mm)		
Mean (SD)	1.26 (0.456)	1.37 (0.441)
Median [Min, Max]	1.19 [0.332, 2.73]	1.37 [0.449, 2.73]
Not available	19 (18.3%)	0 (0%)
Highest B value		
Mean (SD)	954 (101)	965 (82.7)
Median [Min, Max]	1000 [800, 1400]	1000 [800, 1200]
Not available	22 (21.2%)	2 (1.2%)
Echo time (ms)		
Mean (SD)	78.1 (15.5)	77.9 (12.6)
Median [Min, Max]	75.6 [30.0, 134]	78.0 [52.0, 109]
Not available	19 (18.3%)	0 (0%)

Suppl. Table 2. Evaluation of homogeneous, intra-individual, scan parameters between diagnosis and response

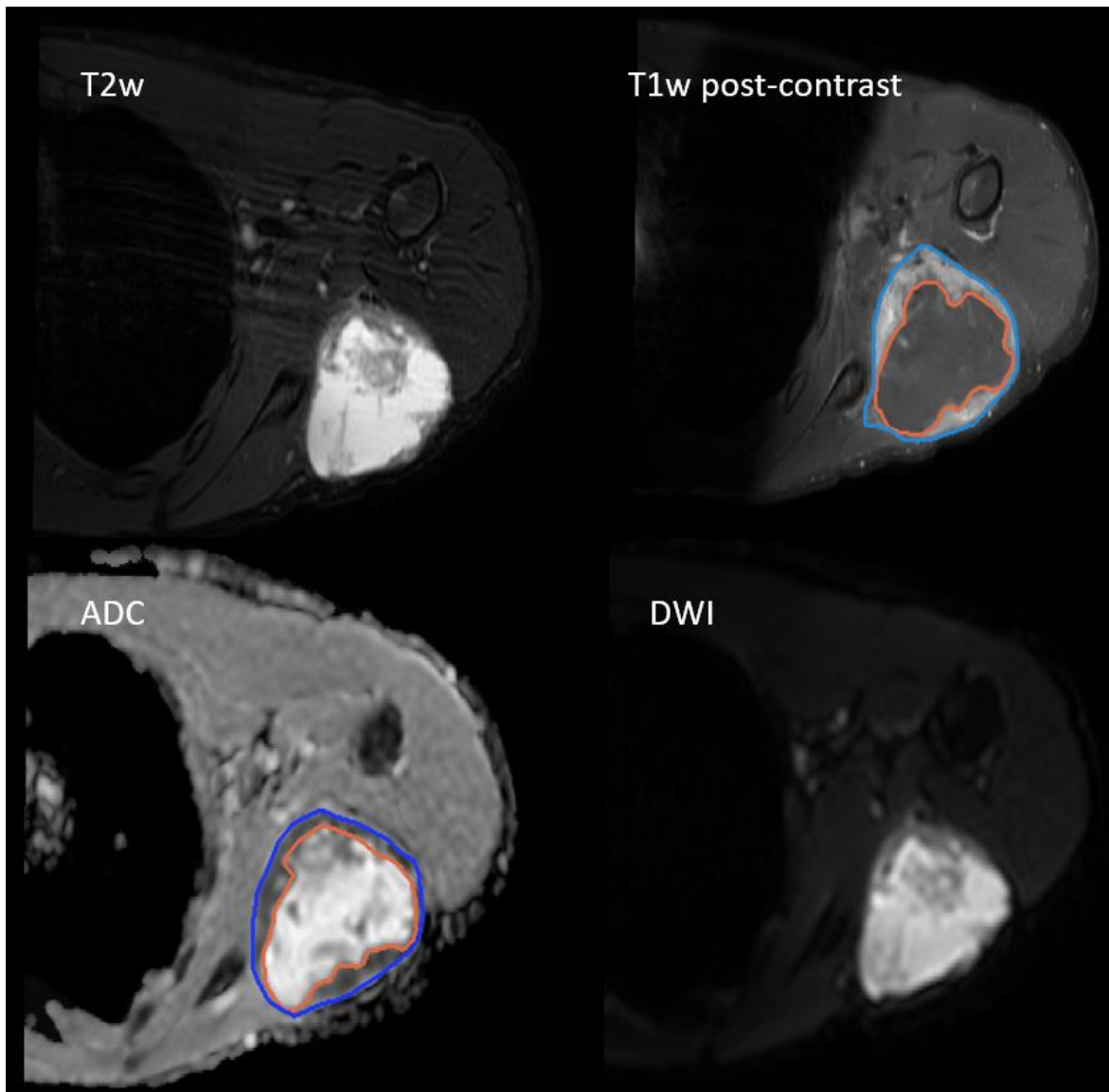|	All patients (n = 134)	Included for ADC analyses (n = 82)
Manufacturer		
Equal	96 (71.6%)	68 (82.9%)
Different	38 (28.4%)	14 (17.1%)
Slice thickness (mm)*		
Equal	71 (53.0%)	56 (68.3%)
Different	63 (47.0%)	26 (31.7%)
Number of B values		
Equal	88 (65.7%)	66 (80.5%)
Different	46 (34.3%)	16 (19.5%)
Pixel spacing (mm)*		
Equal	70 (52.2%)	53 (64.6%)
Different	64 (47.8%)	29 (35.4%)
Highest B value*		
Equal	92 (68.7%)	71 (86.6%)
Different	42 (31.3%)	11 (13.4%)
Echo time (ms)*		
Equal	81 (60.4%)	58 (70.7%)
Different	53 (39.6%)	24 (29.3%)
All combined		
Full scan equal	44 (32.8%)	38 (46.3%)
Different	90 (67.2%)	44 (53.7%)

* A 10% range of difference between scans was considered homogeneous

Supplemental Table 3. ADC values [95% CI] for the cohort and disease characteristics

ADC	Diagnosis	Response	Absolut change	Percentage change
Excluding necrotic / cystic areas				
Mean	1.13 [1.07 – 1.19]	1.55 [1.47 – 1.63]	0.42 [0.34 – 0.51]	44.2 [34.6 – 53.9]
Median	1.10 [1.04 – 1.17]	1.56 [1.48 – 1.65]	0.46 [0.37 – 0.56]	50.1 [39.1 – 61.2]
5th perc	0.80 [0.74 – 0.86]	1.07 [0.98 – 1.15]	0.26 [0.18 – 0.34]	
95th perc	1.55 [1.48 – 1.63]	2.01 [1.92 – 2.10]	0.46 [0.36 – 0.56]	
Including necrotic / cystic areas				
Mean	1.13 [1.07 – 1.19]	1.56 [1.48 – 1.64]	0.43 [0.34 – 0.51]	44.3 [34.6 – 54.0]
Median	1.10 [1.04 – 1.17]	1.57 [1.48 – 1.66]	0.47 [0.37 – 0.56]	50.4 [39.3 – 61.4]
5th perc	0.80 [0.74 – 0.86]	1.06 [0.98 – 1.15]	0.26 [0.18 – 0.35]	
95th perc	1.56 [1.48 – 1.64]	2.02 [1.93 – 2.11]	0.46 [0.36 – 0.56]	
Alveolar rhabdomyosarcoma				
Mean	0.96 [0.78 – 1.13]	1.42 [1.26 – 1.59]	0.46 [0.24 – 0.69]	55.4 [33.4 – 77.4]
Median	0.90 [0.73 – 1.07]	1.44 [1.25 – 1.62]	0.53 [0.30 – 0.77]	68.2 [40.5 – 95.9]
Embryonal rhabdomyosarcoma				
Mean	1.17 [1.11 – 1.24]	1.57 [1.48 – 1.67]	0.40 [0.30 – 0.50]	39.7 [28.6 – 50.9]
Median	1.16 [1.09 – 1.23]	1.58 [1.48 – 1.68]	0.42 [0.31 – 0.53]	43.5 [31.1 – 55.8]
Tumor size ≤ 5 cm				
Mean	1.11 [1.02 – 1.20]	1.54 [1.41 – 1.68]		
Median	1.10 [1.01 – 1.19]	1.56 [1.42 – 1.70]		
Tumor size > 5 cm				
Mean	1.15 [1.05 – 1.24]	1.56 [1.47 – 1.66]		
Median	1.11 [1.01 – 1.20]	1.57 [1.46 – 1.67]		
Standard risk group				
Mean	1.17 [1.06 – 1.28]	1.51 [1.33 – 1.69]		
Median	1.17 [1.05 – 1.28]	1.53 [1.34 – 1.72]		
High risk group				
Mean	1.19 [1.07 – 1.30]	1.60 [1.51 – 1.70]		
Median	1.16 [1.04 – 1.28]	1.62 [1.51 – 1.72]		
Very high - localized				
Mean	0.85 [0.78 – 0.91]	1.65 [1.26 – 2.04]		
Median	0.77 [0.70 – 0.84]	1.69 [1.24 – 2.13]		
Very high - metastatic				
Mean	1.05 [0.94 – 1.16]	1.47 [1.28 – 1.66]		
Median	1.01 [0.91 – 1.12]	1.46 [1.26 – 1.66]		

Suppl. Table 4. Events in all patients and patients included for ADC analyses

	All patients	Included patients for ADC analyses
Event		
Local relapse	18 (13.4%)	13 (15.9%)
Progressive disease	11 (8.2%)	5 (6.1%)
Metastatic relapse	16 (11.9%)	11 (13.4%)
Local and metastatic relapse	2 (1.5%)	2 (2.4%)
Toxic death	0 (0%)	0 (0%)
No event	87 (64.9%)	51 (62.2%)

Suppl. Figure 1. Embryonal rhabdomyosarcoma of the extremity with strong central necrosis at diagnosis, the mean ADC was 71.0% higher when including necrotic parts as compared to excluding