

Parameter	Sagittal sequence	Axial sequence	Oblique axial sequence	Oblique coronal sequence (low rectal)
Recovery Time (TR)	5020	3420	5200	5000
Echo Time (TE)	89	85	95	93
Field of View (FOV)	26/26	40/40	20/20	20/20
Number of excitations (NEX)	4	2	6	6
Slice thickness/gap	4/1	5/1	3/0.3	3/0.3
Number of slices	19	30	Variable (tumour size)	Variable (tumour size)

Table 1. Parameters for the sagittal, axial, and the oblique MRI scans.

TRG	MRTRG	DESCRIPTION
TRG 1	mrTRG1	No signs of regression / similar appearance to pre-treatment
TRG 2	mrTRG2	Dominant tumour mass/signal intensity, with apparent fibrosis, chronic inflammation, and/or vasculopathy
TRG 3	mrTRG3	Dominant fibrotic changes and signal intensity, with substantial tumour load
TRG 4	mrTRG4	Few tumour cells remaining, with substantial fibrosis / low signal intensity
TRG 5	mrTRG5	Complete Response, no tumour cells / absence of tumour signal.

Table 2. Tumour regression grade and corresponding description as assessed by MRI (mrTRG) and by histopathology (TRG).

MRTA parameters		CR	Non-CR	p-value
		(Mean±SD)	(Mean±SD)	
First post-treatment scan (MRI2)	Mean	-73.19±11.76	-5.05±19.95	0.033
	SD	222.06±8.18	191.14±16.14	0.048
	Entropy	6.09±0.03	5.91±0.06	0.007
	MPP	194.40±7.17	177.50±15.00	0.189
	Skewness	0.28±0.02	0.04±0.05	0.000
	Kurtosis	0.49±0.06	.38±0.11	0.963
Second post-treatment scan (MRI3)	Mean	-68.50±16.12	-52.68±30.85	0.769
	SD	244.50±11.84	219.14±26.86	0.042
	Entropy	6.23±0.04	6.01±0.10	0.014
	MPP	214.05±10.07	186.48±23.78	0.032
	Skewness	0.27±0.03	.01±0.06	0.000
	Kurtosis	0.25±0.06	.05±0.08	0.449

Table 3. MRTA parameters derived from first and second post-treatment scans in identifying CR with no filtration. Statistically significant parameters are in bold. SD: Standard Deviation; MPP: mean of positive pixels.

MRTA parameters			CR	Non-CR	p-value
			(Mean±SD)	(Mean±SD)	
First post-treatment scan (MRI2)	Skewness	SSF 2	0.113±0.093	0.125±0.047	0.832
		SSF 3	0.017±0.118	0.177±0.047	0.055
		SSF 4	-0.121±0.131	0.240±0.047	0.007
		SSF 5	0.136±0.147	0.271±0.049	0.008
		SSF 6	0.058±0.159	0.278±0.050	0.036
Second post-treatment scan (MRI3)	Skewness	SSF 2	-0.051±0.133	0.113±0.072	0.309
		SSF 3	-0.195±0.143	0.169±0.06	0.016
		SSF 4	-0.135±0.157	0.223±0.049	0.014
		SSF 5	0.039±0.152	0.249±0.049	0.066
		SSF 6	0.053±0.124	0.281±0.062	0.216

Table 4. Mean and standard deviation values of Skewness extracted from first and second post-treatment scans at different SSF values. Statistically significant parameters are in bold. SSF: spatial scale filter in mm.

MRTA parameters	SSF	Area Under Curve	p-value	Youden's index	Optimal cut-off value	
MRI2	Mean	0	0.795	0.019	0.645833	-165.625
	Entropy	0	0.750	0.048	0.583333	5.84
	Skewness	4	0.806	0.015	0.5416	0.26
MRI3	SD	0	0.847	0.006	0.645833	103.845
	Entropy	0	0.880	0.003	0.770833	5.745
	MPP	0	0.866	0.004	0.708333	50.265

Table 5. Optimal cut-off values of MRTA parameters in predicting CR after NCRT. SD: Standard Deviation; MPP: Mean of positive pixels.