Supplementary

Table S1 The interobserver variability of diffusion metrics

Metric	ICC	95% CI	P value
ALPS-index ipsilateral to glioma	0.927	0.888–0.953	<0.001
ALPS-index contralateral to glioma	0.836	0.695–0.905	<0.001
FA-tumor	0.897	0.841–0.934	<0.001
MD-tumor	0.967	0.948–0.978	<0.001
MK-tumor	0.972	0.957–0.982	<0.001
Bilateral ALPS-index of healthy controls	0.954	0.905–0.978	<0.001
FA-edema	0.895	0.832–0.935	<0.001
MD-edema	0.809	0.694–0.881	<0.001
MK-edema	0.819	0.711–0.887	<0.001

ICC, intraclass correlation coefficient; CI, confidence interval; ALPS, analysis along the perivascular space; FA, fractional anisotropy; MD, mean diffusivity; MK, mean kurtosis.

Table S2 Comparisons among grade II, III, and IV gliomas with age adjustment

Metric	Grade II	Grade III	Grade IV	P	$P_{II\ vs.\ III}$	$P_{II\ vs.\ IV}$	$P_{III\ vs.\ IV}$
ALPS-index	1.495±0.161	1.495±0.139	1.320±0.159	<0.001	1.000	<0.001	0.001
FA-tumor	0.121±0.048	0.126±0.061	0.166±0.103	0.071	1.000	0.101	0.301
MD-tumor	1.477±0.382	1.114±0.222	0.975±0.257	<0.001	0.001	<0.001	0.391
MK-tumor	0.452±0.115	0.595±0.175	0.686±0.172	<0.001	0.013	<0.001	0.176
FA-edema	0.179±0.068	0.169±0.068	0.191±0.077	0.554	1.000	1.000	0.896
MD-edema	1.451±0.253	1.442±0.245	1.377±0.303	0.492	1.000	0.840	1.000
MK-edema	0.495±0.076	0.515±0.097	0.547±0.110	0.215	1.000	0.272	0.943

Data are presented as mean ± standard deviation. MD is in units of 10^{-3} mm^2/s. ALPS, analysis along the perivascular space; FA, fractional anisotropy; MD, mean diffusivity; MK, mean kurtosis.

Table S3 Multivariable logistic regression analysis of diffusion metrics in evaluating tumor grade

Regression model	Variable	B	SE	P value
FA + ALPS-index	FA	7.145	3.361	0.033
	ALPS-index	–7.319	1.876	<0.001
MD + ALPS-index	MD	–3.829	1.185	0.001
	ALPS-index	–6.413	1.947	0.001
MK + ALPS-index	MK	5.947	1.950	0.002
	ALPS-index	–5.991	1.876	0.001

B, unstandardized coefficient; SE, standard error; FA, fractional anisotropy; ALPS, analysis along the perivascular space; MD, mean diffusivity; MK, mean kurtosis.

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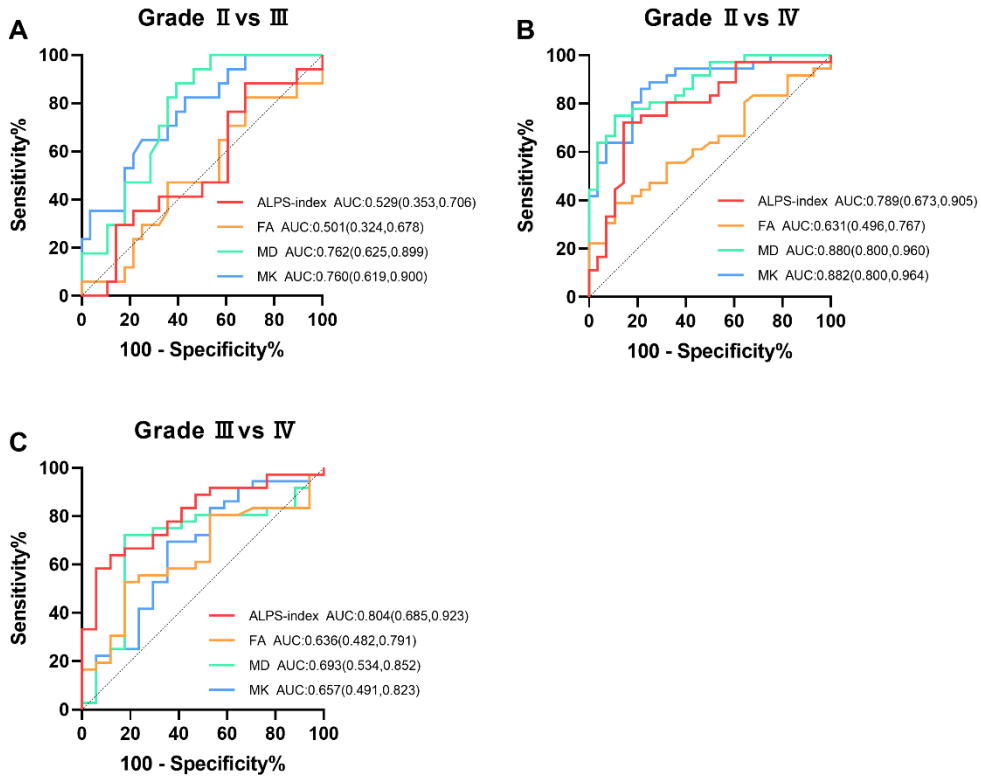

Figure S1 ROC curves of diffusion metrics in differentiating grade II from grade III gliomas (A), grade II from grade IV gliomas (B), and grade III from grade IV gliomas (C). The data in parenthesis are shown as 95% CI. ALPS, analysis along the perivascular space; FA, fractional anisotropy; MD, mean diffusivity; MK, mean kurtosis; ROC, receiver operating characteristic.

Table S4 Diagnostic performance of diffusion metrics in differentiating grade II from grade III gliomas, grade II from grade IV gliomas, and grade III from grade IV gliomas

Grade	Metric	AUC (95% CI)	Cutoff value	Sensitivity (%)	Specificity (%)
II *vs.* III	ALPS-index	0.529 (0.353, 0.706)	1.621	88.24	32.14
	FA	0.501 (0.324, 0.678)	0.142	82.35	32.14
	MD	0.762 (0.625, 0.899)	1.276	88.24	60.71
	MK	0.760 (0.619, 0.900)	0.508	64.71	75.00
II *vs.* IV	ALPS-index	0.789 (0.673, 0.905)	1.381	72.22	85.71
	FA	0.631 (0.496, 0.767)	0.174	38.89	89.29
	MD	0.880 (0.800, 0.960)	1.064	75.00	89.29
	MK	0.882 (0.800, 0.964)	0.514	86.11	78.57
III *vs.* IV	ALPS-index	0.804 (0.685, 0.923)	1.327	58.33	94.12
	FA	0.636 (0.482, 0.791)	0.142	52.78	82.35
	MD	0.693 (0.534, 0.852)	1.052	72.22	82.35
	MK	0.657 (0.491, 0.823)	0.579	69.44	64.71

AUC, area under the curve; CI, confidence interval; ALPS, analysis along the perivascular space; FA, fractional anisotropy; MD, mean diffusivity; MK, mean kurtosis.

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Table S5 Multivariable logistic regression analysis of diffusion metrics in evaluating *IDH1* mutation status in LrGGs

Regression model	Variable	B	SE	P value
FA + ALPS-index	FA	–17.126	8.801	0.034
	ALPS-index	6.842	2.901	0.018
MD + ALPS-index	MD	3.734	1.721	0.03
	ALPS-index	6.369	1.933	0.028
MK + ALPS-index	MK	–7.273	2.977	0.015
	ALPS-index	5.728	2.875	0.046

IDH1, isocitrate dehydrogenase 1; LrGG, lower-grade glioma; B, unstandardized coefficient; SE, standard error; FA, fractional anisotropy; ALPS, analysis along the perivascular space; MD, mean diffusivity; MK, mean kurtosis.

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