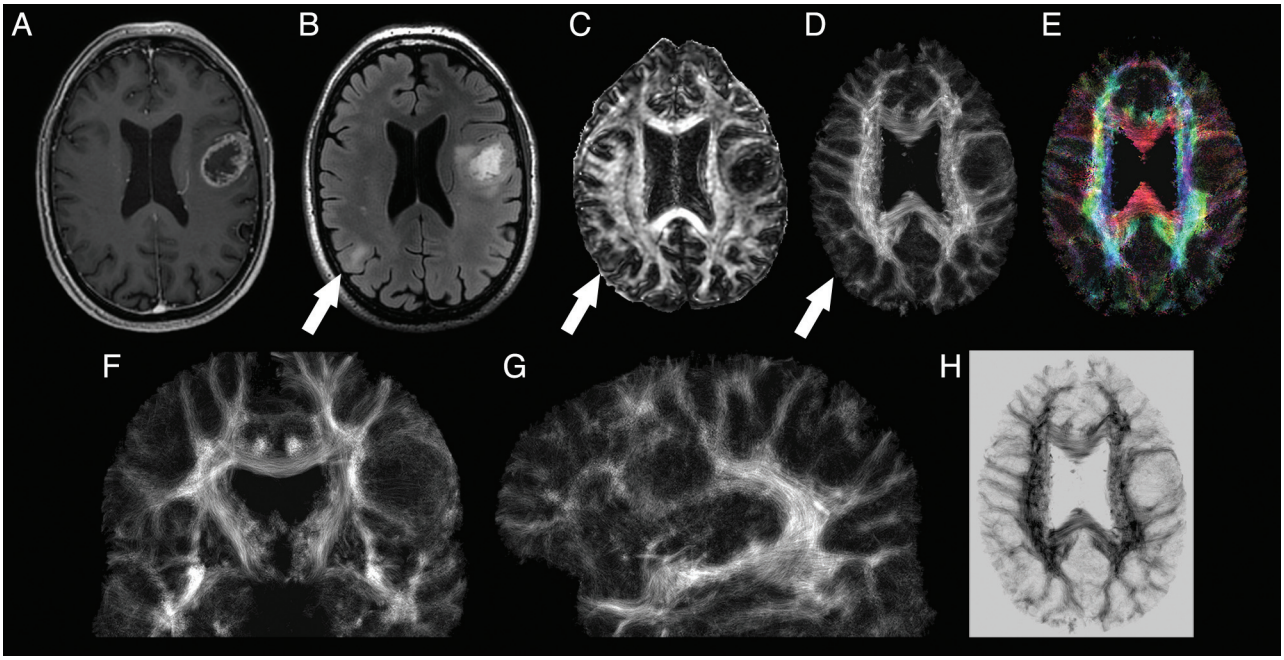

ON-LINE FIG. 1. Track density and FA values differ between regions of tumor and normal-appearing white matter. *A*, Contrast-enhanced T1-spoiled gradient-recalled and (*B*) FLAIR images coregistered with (*C*) fractional anisotropy maps (2.0-mm reconstruction) and (*D*) track density map (0.25-mm reconstruction) from patient 17 demonstrate an example of the cohortwide findings of significantly elevated track density values within the genu (track density, 30.22) and splenium of the corpus callosum (track density, 22.04) compared with the centrum semiovale (track density, 19.07; $P < .01$). FA values were significantly elevated within the genu (FA, 0.254) and splenium of the corpus callosum (FA, 0.256) compared with the centrum semiovale (FA, 0.113; $P < .01$). No statistically significant difference was observed between genu and splenium FA values, suggesting that TDI provides improved spatial resolution and tissue contrast of white matter structures compared with FA maps. Note that (*E*) track density directionally encoded color map (1 million tracks and 0.25-mm isotropic grid; color coding indicates local orientation of the streamlines, *blue*: cranial to caudal, *red*: right to left, *green*: anterior to posterior), (*F*) coronal track density image, (*G*) sagittal track density image, and (*H*) inverse white-on-black axial track density image demonstrate linear architecture within the centrally necrotic region of the tumor that is not appreciated on the FA map. In addition, a separate focus of NE T2 FLAIR hyperintensity within the contralateral right parietal lobe (*arrow*) demonstrates altered track density characteristics not definitively appreciated on the FA map. This site was later noted to demonstrate MR imaging characteristics consistent with a metastatic focus of GBM.

On-line Table 1: Patient cohort demographics and diffusion-weighted MR imaging values

Patient No./Sex	Biopsy	Tumor Region	Tumor TD	WM TD	rTD	Tumor ADC	WM ADC	rADC	Tumor FA	WM FA	rFA
1/M	1	CN	3.07	2.07	1.48	892	639	1.40	0.013	0.013	1.00
	2	CN	4.21	2.07	2.03	987	672	1.47	0.012	0.021	0.55
	3	CN	1.8	2.07	0.87	734	612	1.20	0.011	0.037	0.29
	4	CE	2.51	2.07	1.21	935	639	1.46	0.017	0.013	1.31
2/M	5	CN	5.7	1.7	3.35	1117	619	1.80	0.013	0.032	0.41
	6	CN	9.24	1.7	5.44	727	650	1.12	0.027	0.032	0.83
3/M	7	NE	8.49	2.34	3.63	588	594	0.99	0.020	0.019	1.09
	8	NE	8.56	2.34	3.66	575	554	1.04	0.014	0.015	0.94
4/M	9	NE	2.04	2.47	0.83	735	716	1.03	0.017	0.037	0.46
	10	NE	3.46	2.47	1.40	916	716	1.28	0.015	0.037	0.40
5/M	11	CE	2.02	1.15	1.76	1321	632	2.09	0.020	0.035	0.56
	12	CE	1.58	1.15	1.37	1298	612	2.12	0.016	0.032	0.51
6/M	13	CE	5.59	1.55	3.61	916	556	1.65	0.016	0.043	0.38
	14	CE	3.73	1.55	2.41	984	614	1.60	0.015	0.053	0.28
7/F	15	NE	3.96	1.91	2.07	571	595	0.96	0.012	0.018	0.66
	16	CE	6.84	4.3	1.59	676	698	0.97	0.017	0.013	1.33
	17	NE	5.21	3.78	1.38	1321	694	1.90	0.015	0.019	0.77
	18	CE	8.03	18.49	0.43	1022	635	1.61	0.011	0.016	0.65
8/M	19	NE	14.85	22.6	0.66	655	550	1.19	0.016	0.017	0.96
	20	CE	8.1	6.19	1.31	554	732	0.76	0.014	0.019	0.72
9/F	21	CE	3.09	2.99	1.03	1193	778	1.53	0.102	0.157	0.65
	22	CE	2.13	2.99	0.71	1192	777	1.53	0.109	0.154	0.71
	23	CE	2.98	2.99	1.00	732	877	0.83	0.128	0.162	0.79
10/M	24	NE	7.26	8.35	0.87	692	465	1.49	0.069	0.053	1.29
	25	CE	3.81	23.5	0.16	490	517	0.95	0.053	0.049	1.08
	26	CE	16.13	24.11	0.67	630	459	1.37	0.045	0.036	1.27
	27	CE	5.11	2.76	1.85	493	517	0.95	0.025	0.049	0.50
11/F	28	NE	4.12	1.88	2.19	1051	876	1.20	0.045	0.033	1.36
	29	NE	3.64	2.16	1.69	1186	876	1.35	0.042	0.033	1.26
12/M	30	NE	1.13	1.16	0.97	926	452	2.05	0.029	0.013	0.23
	31	CE	1.6	1.2	1.33	505	532	0.95	0.038	0.025	1.53
13/F	32	CN	1.58	1.15	1.37	1082	439	2.46	0.021	0.035	0.61
	33	CE	4.65	4.53	1.03	448	439	1.02	0.036	0.035	1.05
14/F	34	CE	0.23	1.46	0.16	613	606	1.01	0.053	0.049	1.09
15/M	35	CE	0.18	1.23	0.15	665	614	1.08	0.036	0.029	1.21
	36	CE	0.11	3.05	0.04	555	630	0.88	0.040	0.032	1.27
	37	CE	2.68	2.28	1.18	1187	471	2.52	0.039	0.040	0.96
16/M	38	CE	4.44	1.3	3.42	583	648	0.90	0.021	0.025	0.84
	39	NE	4.53	2.44	1.86	469	467	1.00	0.039	0.090	0.43
17/M	40	CE	3.65	1.43	2.55	427	593	0.72	0.108	0.075	1.43
	41	CN	2.29	3.82	0.60	855	207	4.13	0.018	0.096	0.19
18/M	42	CE	1.25	3.92	0.32	643	683	0.94	0.036	0.029	1.25
	43	CE	1.4	2.67	0.52	1031	583	1.77	0.023	0.036	0.63
Mean (SD)			4.35 (3.35)	4.36 (5.98)	1.54 (1.15)	818 (268)	610 (129)	1.40 (0.62)	0.034 (0.029)	0.046 (0.029)	0.83 (0.37)

Note:—All data are presented as mean (SD) values.

M indicates male; F, female; CN, centrally necrotic region; TD, track density value; ADC, apparent diffusion coefficient value expressed as $x10^{-6}$ mm^2/s; rTD, relative track density value.

On-Line Table 2: Comparison of track density imaging characteristics based on CE morphologic features of tumor tissue specimens

	Track Density	Relative Track Density		Track Density	Relative Track Density		Track Density	Relative Track Density
CN	3.98 (2.74)	2.16 (1.70)	CN	3.98 (2.74)	2.16 (1.70)	CE	3.97 (3.53)	1.27 (0.95)
CE	3.97 (3.53)	1.27 (0.95)	NE	5.32 (3.72)	1.71 (1.08)	NE	5.32 (3.72)	1.71 (1.08)
P value	.99	.23	*P* value	.38	.54	*P* value	.31	.25

Note:—MR imaging values are presented as mean (SD). CN indicates centrally necrotic.
P value <.05 is considered statistically significant.

On-Line Table 3: Comparison of cellular immunohistochemical characteristics based on CE morphologic features of tumor tissue specimens

	Tumor	Hypoxia	Infiltration	Hyperplasia	Proliferation
CN	1.71 (0.91)	1.33 (0.98)	1.42 (1.51)	0.71 (0.91)	15.4 (9.59)
NE	1.91 (0.99)	0.27 (1.14)	1.25 (0.91)	0.79 (0.66)	10.87 (8.18)
P value	.66	.16	.72	.85	.32
	Tumor	Hypoxia	Infiltration	Hyperplasia	Proliferation
CN	1.71 (0.91)	1.33 (0.98)	1.42 (1.51)	0.71 (0.91)	15.4 (9.59)
CE	1.73 (1.01)	1.46 (1.10)	0.82 (1.24)	1.13 (0.80)	15.6 (13.9)
P value	.97	.48	.95	.31	.97
	Tumor	Hypoxia	Infiltration	Hyperplasia	Proliferation
NE	1.91 (0.99)	0.27 (1.14)	1.25 (0.91)	0.79 (0.66)	10.87 (8.18)
CE	1.73 (1.01)	1.46 (1.10)	0.82 (1.24)	1.13 (0.80)	15.6 (13.9)
P value	.60	.19	.61	.19	.21

Note:—Histopathologic values are presented as mean (SD). CN indicates centrally necrotic.
P value <.05 is considered statistically significant.