

Pat. No.	Sex	Age (y)	Contrast enhancement	Diagnosis	Localization	Lesion size, maximal diameter (cm)	Clinical symptoms	¹⁸ F-FET uptake ratio	
								TBR _{mean}	TBR _{max}
Non-neoplastic lesions									
1	m	27	+	unspecific (*)	L occ	1.2	seizure	1.7	2.0
2	m	29	-	unspecific	R cer	1.5	incidental, unspecific	1.6	1.9
3	f	58	-	unspecific	L occ	3.6	incidental, unspecific	0.5	1.1
4	f	35	-	unspecific	L temp	0.9	incidental, unspecific	1.5	1.7
5	m	71	-	unspecific	R front	3.7	seizure	0.9	1.5
6	f	41	-	unspecific	L front	2.0	seizure	1.7	1.9
7	f	54	-	unspecific	R front	1.5	incidental, unspecific	1.1	1.3
8	f	66	+	unspecific	L par	3.8	seizure	1.6	1.8
9	m	29	-	unspecific	L front	1.5	neurological deficit	0.8	1.1
10	m	84	-	unspecific	L temp occ	7.7	incidental, unspecific	1.0	1.6
11	f	50	-	demyelination	L basal ganglia	3.0	incidental, unspecific	1.8	2.4
12	m	57	+	demyelination	brainstem	3.8	neurological deficit	2.0	3.3
13	m	36	-	demyelination	L occ	2.5	neurological deficit	0.7	1.0
14	f	41	-	demyelination	L basal ganglia	3.3	neurological deficit	1.7	1.9
15	m	15	+	demyelination	R front par	1.7	neurological deficit	1.9	2.3
16	m	57	-	hematoma	R temp	7.0	mass effect	1.6	1.9
17	m	64	+	hematoma	R occ	3.0	neurological deficit	1.1	1.4
18	m	43	+	hematoma	R par	4.2	seizure	1.3	2.0
19	m	63	+	hematoma	R front	5.8	mass effect	1.9	2.4
20	m	44	+	abscess	R basal ganglia	2.0	neurological deficit	1.2	1.6
21	m	67	-	abscess	R temp	2.9	incidental, unspecific	1.8	2.3

22	m	52	-	abscess (*)	R temp	3.7	incidental, unspecific	1.3	1.8
23	m	24	-	abscess	L front	4.7	incidental, unspecific	1.2	1.4
24	m	62	-	abscess	L par	4.1	neurological deficit	1.8	2.4
25	m	51	+	abscess	R par	3.5	seizure	1.8	2.6

Neoplastic lesions

26	f	45	-	occult glioma	R par	2.5	seizure	1.1	1.5
27	f	23	+	occult glioma	R temp	1.3	seizure	0.7	1.0
28	f	61	-	occult glioma	R par	2.9	seizure	1.8	2.3
29	f	49	-	occult glioma	multifocal	3.6	seizure	1.8	2.5

WHO Grade I tumors

30	m	56	+	PA	brainstem	1.6	neurological deficit	2.6	4.3
31	f	22	-	pineal tumor	4. ventricle	0.7	mass effect	0.7	1.0
32	f	30	-	PA	brainstem	6.5	mass effect	2.2	4.5
33	m	62	+	E	brainstem	0.9	mass effect	1.1	1.3

WHO Grade II tumors

34	m	20	+	A	R par occ	2.6	incidental, unspecific	1.6	1.7
35	f	2	-	A	bithalamic	4.0	mass effect	1.7	2.2
36	f	44	+	A	L front	6.2	seizure	2.0	2.9
37	m	31	-	OA	L temp	6.4	seizure	1.7	2.1
38	f	36	-	A	R front	4.2	mass effect	1.0	2.1
39	m	46	-	A	L front	4.4	seizure	0.7	1.0
40	f	54	-	A	L front temp	4.5	seizure	1.1	1.5
41	f	34	-	A	L par occ	3.5	seizure	1.0	1.4

42	m	29	+	A	R temp	4.3	mass effect	2.6	3.9
43	m	27	-	A	L par	4.0	seizure	0.9	1.5
44	f	39	-	A	R front	3.0	incidental, unspecific	0.8	1.2
45	m	26	+	A	R front	9.6	mass effect	1.6	1.8
46	f	36	-	O	R front	3.4	seizure	2.1	3.0
47	f	54	-	A	R par	5.3	seizure	1.1	1.7
48	f	30	-	A	L front	4.8	seizure	1.1	1.7
49	m	54	+	OA	L occ	4.0	mass effect	2.1	3.4
50	m	31	+	A	R par	5.5	seizure	1.8	2.4
51	f	35	-	A	R front	3.5	incidental, unspecific	0.7	1.0
52	f	44	+	A	L temp	3.0	neurological deficit	2.6	4.2
53	m	43	+	A	L front temp	7.2	mass effect	1.9	3.0
54	f	53	-	A	L front temp	6.6	seizure	2.8	5.1
55	f	37	-	OA	L front temp	3.6	seizure	1.8	2.3
56	m	24	-	A	L temp	4.4	seizure	1.4	1.9
57	m	42	-	A	R front	6.9	seizure	1.0	1.9
58	f	27	-	A	L front temp	5.5	seizure	1.1	1.6
59	f	29	-	A	R insula	6.0	seizure	0.8	1.2
60	m	43	-	A	L insula	7.3	seizure	1.0	1.8
61	f	49	-	A	L front	2.6	seizure	1.9	2.5
62	m	72	-	A	L par	5.0	neurological deficit	1.9	2.6
63	f	48	+	A	L temp	2.7	seizure	2.0	2.8
64	f	20	+	OA	L temp	4.9	neurological deficit	2.6	5.2
65	m	25	-	A	R front	3.9	seizure	1.7	1.9
66	f	40	-	A	L front	6.2	mass effect	1.8	2.1
67	f	17	+	E	pinealis	0.8	mass effect	1.6	1.9

68	f	65	+	A	bifrontal	5.6	seizure	2.2	4.0
69	m	38	-	O	R front par	5.3	seizure	2.2	4.2
70	f	33	-	A	L front	1.6	seizure	1.9	2.4
71	m	39	+	A	L front	4.2	seizure	1.8	2.7
72	m	25	-	A	L front	5.0	seizure	1.6	1.9
73	f	53	+	A	L par	7.0	seizure	1.8	2.3
74	f	31	-	OA	R thalamus	1.8	mass effect	1.3	1.8
75	m	84	-	A	L front	5.5	neurological deficit	1.5	1.6
76	m	44	-	A	L front	4.5	incidental, unspecific	1.8	2.4
77	m	47	-	OA	L par	4.1	seizure	1.7	2.0
78	m	34	-	O	R temp occ	4.5	seizure	2.0	3.0
79	f	62	-	A	R temp	4.2	seizure	2.0	3.0
80	m	50	-	A	R temp occ	6.1	mass effect	2.2	3.6
81	m	32	-	A	L temp	6.8	seizure	2.3	4.4
82	m	53	-	OA	R par occ	5.4	mass effect	1.8	2.3
83	m	63	-	A	L front temp	6.6	seizure	0.8	1.1
84	f	62	-	OA	R front	6.3	incidental, unspecific	1.9	2.8
85	f	35	-	A	R front	1.2	mass effect	1.9	2.8
86	m	32	-	OA	L front	1.8	seizure	2.5	4.1
87	f	28	+	E	R temp par	2.2	seizure	2.2	3.5
88	f	67	+	A	L temp par	4.6	seizure	2.1	3.1
89	m	32	-	A	L occ	4.0	seizure	0.7	1.2
90	m	47	-	A	L temp	2.6	seizure	1.8	2.3
91	f	39	+	OA	L front	4.6	neurological deficit	1.6	1.8
92	m	58	-	A	L ventricle	3.8	neurological deficit	2.3	3.3
93	m	11	-	A	L thalamus	3.5	incidental, unspecific	1.2	1.8

94	f	66	-	O	L front	3.4	neurological deficit	1.2	1.8
95	m	43	-	A	L par	3.9	seizure	1.2	1.7
96	m	41	-	O	L front	3.7	seizure	1.8	2.3
97	f	44	-	A	R front	5.4	seizure	1.0	1.7
98	m	57	-	OA	L par	3.6	seizure	1.8	2.3
99	m	40	-	A	L temp occ	3.8	seizure	1.1	1.5
100	f	42	-	A	R front	2.0	incidental, unspecific	1.0	1.4
101	f	46	-	A	L temp occ	6.6	incidental, unspecific	2.0	2.9
102	m	47	-	A	R front	4.1	seizure	1.8	2.1
103	m	27	+	A	bifrontal	8.6	mass effect	2.0	3.4
104	m	38	-	OA	L front	5.6	seizure	1.1	1.8
105	f	27	-	O	R front	1.5	neurological deficit	0.9	1.1
106	m	44	-	A	L front	5.7	seizure	1.9	2.4

WHO Grade III (anaplastic) tumors

107	f	36	-	O	R front	2.4	seizure	1.9	2.4
108	m	49	-	A	L thalamus	4.4	neurological deficit	1.7	2.0
109	f	10	-	A	multifocal	2.7	mass effect	2.5	5.2
110	m	34	-	A	L front	4.2	seizure	0.7	1.2
111	m	41	+	OA	R front	6.3	seizure	2.4	4.3
112	m	52	-	A	R front	2.9	mass effect	1.9	2.6
113	m	57	+	A	R occ	3.6	neurological deficit	3.8	6.3
114	f	37	+	OA	L front	4.6	seizure	2.4	3.8
115	f	39	-	A	bithalamic	1.4	incidental, unspecific	2.0	3.2
116	m	27	-	A	L temp	4.8	seizure	1.4	2.0
117	f	50	-	OA	R par temp occ	3.5	seizure	0.9	1.3

118	m	7	+	O	R temp	2.2	seizure	2.9	4.5
119	f	15	+	A	R front	7.5	neurological deficit	2.3	3.7
120	m	39	+	A	R par occ	6.4	seizure	2.1	2.7
121	f	22	+	A	L cerebell	5.2	incidental, unspecific	1.9	3.3
122	m	46	-	A	R temp	6.8	seizure	0.8	1.9
123	m	42	-	A	L temp	8.2	mass effect	1.9	2.7
124	m	55	+	O	R temp par	5.3	seizure	3.0	4.6
125	f	36	+	OA	R front par	3.9	seizure	1.9	2.4
126	m	29	+	OA	L front	7.8	seizure	2.4	5.0
127	m	34	-	A	L front	4.4	seizure	2.5	5.3
128	m	41	-	OA	R front	6.2	neurological deficit	0.9	1.6
129	m	34	+	OA	bifrontal	10.6	incidental, unspecific	2.6	5.4
130	m	66	+	A	multifocal	5.8	seizure	2.4	4.5
131	m	30	+	OA	bifrontal	3.3	incidental, unspecific	2.6	4.7
132	f	20	-	A	L par occ	5.6	seizure	0.9	1.3
133	f	46	+	A	bifrontal	8.0	incidental, unspecific	2.7	4.3
134	m	58	+	O	L front temp	4.2	seizure	2.3	4.3
135	f	56	+	O	R front	4.2	seizure	2.7	4.9
136	f	68	+	O	R front	5.2	seizure	3.0	7.0
137	m	40	-	A	RT deep	4.5	seizure	0.9	1.2
138	m	63	+	A	R temp	1.7	incidental, unspecific	2.5	5.0
139	f	58	-	A	L temp	3.2	seizure	1.7	2.1
140	f	63	-	O	L temp	7.2	mass effect	1.8	4.0
141	m	39	-	OA	L front	5.6	seizure	2.2	3.7
142	f	23	+	A	R front	0.9	mass effect	1.6	1.9
143	f	57	+	OA	R par	2.4	incidental, unspecific	2.3	3.9

144	f	43	+	O	R temp	2.9	seizure	1.9	2.6
145	f	32	+	O	R front temp	4.1	mass effect	2.1	3.0
146	f	47	-	A	L temp	3.3	incidental, unspecific	2.0	2.9
147	m	49	+	OA	R front	11.9	seizure	1.9	2.6
148	m	55	-	O	R par	3.9	seizure	1.7	2.3
149	f	51	+	A	L front par	3.6	neurological deficit	2.0	3.5
150	m	30	+	A	R par	1.3	seizure	2.9	4.7
151	f	49	+	A	bifrontal	11.5	incidental, unspecific	3.0	6.3
152	f	57	+	O	L temp	5.9	seizure	2.4	4.7
153	m	53	-	A	L front	6.1	seizure	1.9	2.8

WHO Grade IV tumors

154	f	59	+	GBM	L temp	1.8	seizure	1.9	2.6
155	m	55	+	GBM	L temp	1.3	incidental, unspecific	2.3	4.3
156	m	38	+	GBM	R front	2.6	neurological deficit	2.2	3.2
157	f	69	+	GBM	bifrontal	7.5	incidental, unspecific	2.2	4.6
158	m	45	+	GBM	R temp par	5.0	seizure	2.2	3.6
159	m	45	+	GBM	R temp occ	3.3	seizure	2.3	3.6
160	f	58	+	GBM	L insula	3.2	incidental, unspecific	2.8	4.7
161	m	41	+	GBM	bifrontal	3.9	incidental, unspecific	2.4	3.7
162	m	53	+	GBM	bifrontal	2.3	seizure	3.2	7.9
163	m	62	+	GBM	L front	3.1	seizure	2.4	3.7
164	f	68	+	GBM	R temp par occ	4.7	mass effect	2.1	2.9
165	m	64	+	GBM	L par occ	2.0	seizure	2.3	3.7
166	m	59	+	GBM	R front	1.5	seizure	2.0	2.9
167	f	49	+	GBM	R front	3.4	incidental, unspecific	1.9	2.6

168	m	75	+	GBM	L front par	4.5	mass effect	2.1	3.3
169	m	64	+	GBM	R par occ	5.7	mass effect	2.2	4.4
170	f	70	+	GBM	L front	5.2	seizure	2.4	4.6
171	m	70	+	GBM	L occ	4.8	mass effect	2.0	3.3
172	m	58	-	GBM	L temp	5.4	neurological deficit	2.9	5.2

Lymphomas

173	f	61	-	Lymphoma	R basal ganglia	1.5	neurological deficit	1.6	1.9
174	m	63	+	Lymphoma	R insula	11.8	mass effect	2.0	2.9

A: patient number

B: sex: F = female, M = male

C: age in years at the time of the PET study

D: contrast enhancement in MRI; + positive, - negative

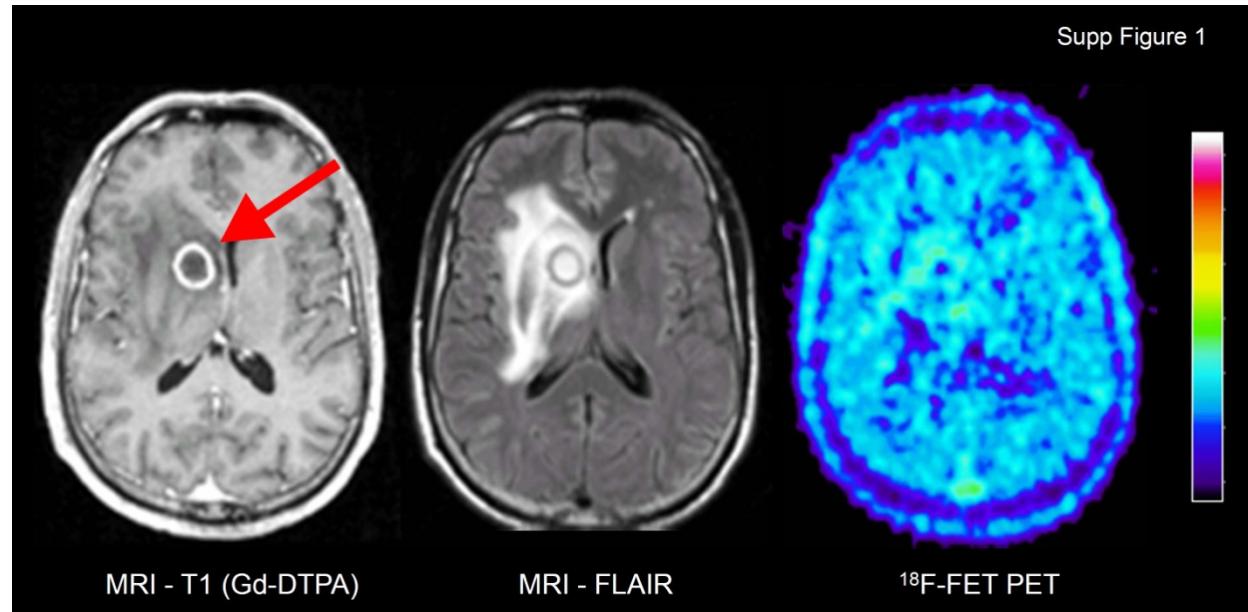
E: occult glioma: lesion that was 18F-FET positive and showed unspecific histology but progressed to a HGG in the further course; A = astrocytoma; O = oligodendrogloma , OA = oligoastrocytoma; GBM = glioblastoma

F: Localization L = left hemispheric, R = right hemispheric, Front = frontal, Par = parietal, Occ = occipital, Temp = temporal, cer = cerebellum

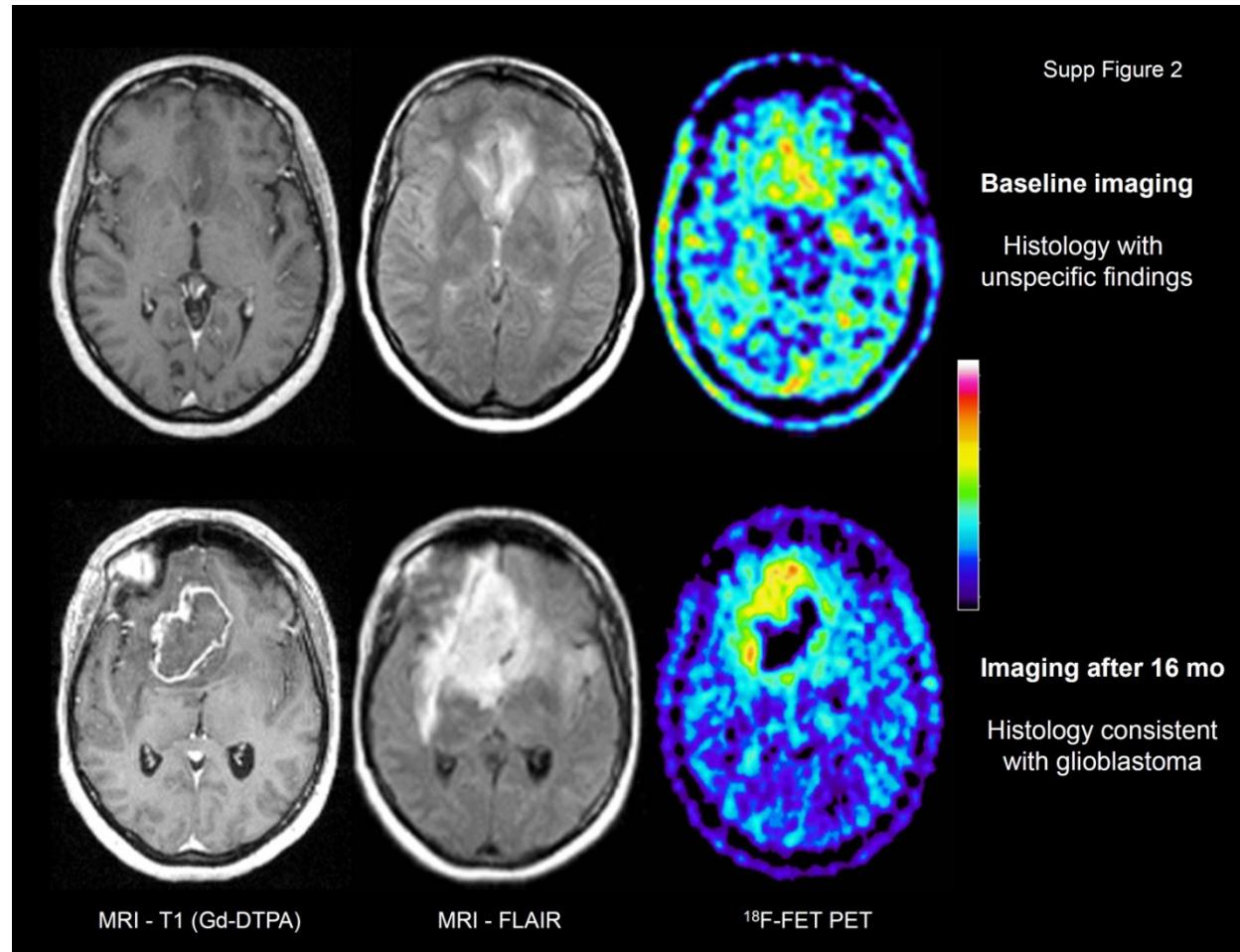
I: TBRmean: ratio of mean 18F-FET-uptake in the lesion divided by mean uptake in the brain

J: TBRmax: ratio of maximal 18F-FET-uptake in the lesion divided by mean uptake in the brain

Supp Figure 1

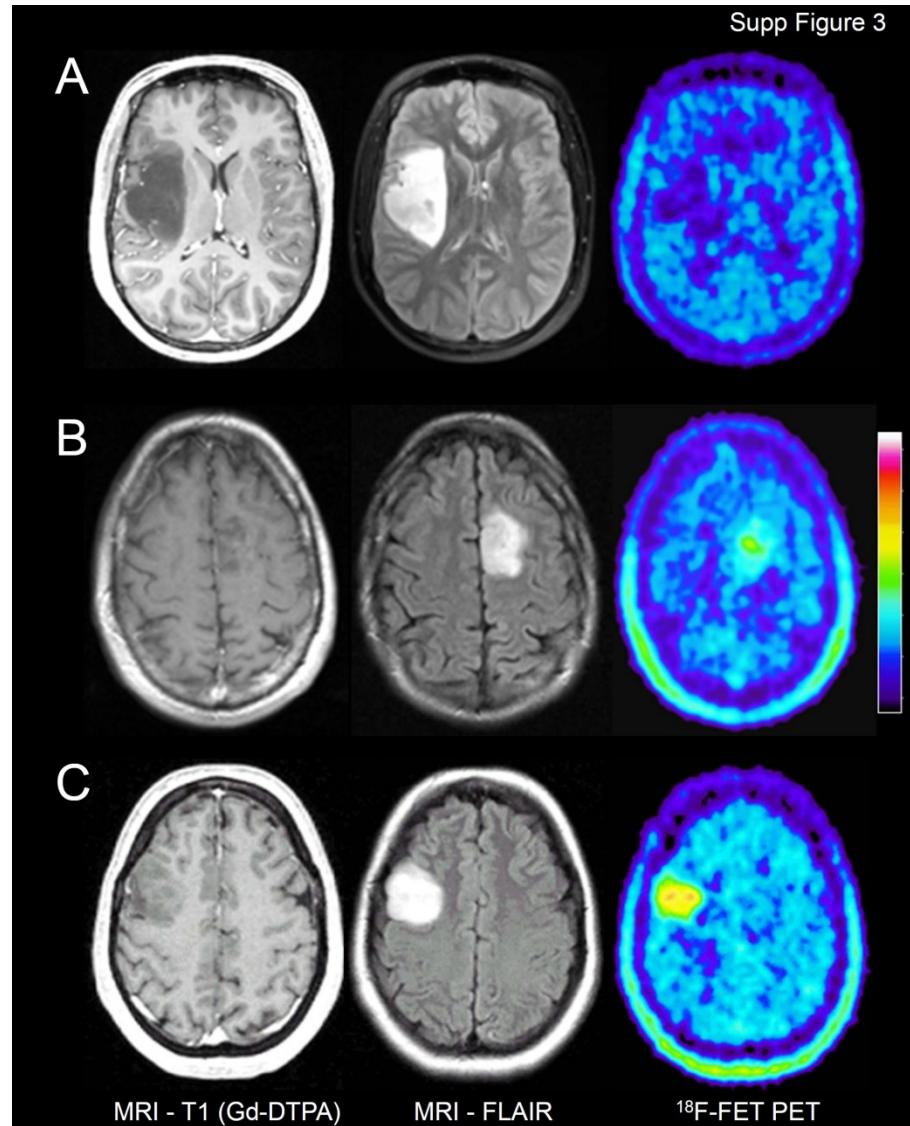


Supp. Fig. 1: MR imaging of a 44-year-old male patient (pat. no. 20) shows a small ring-enhancing lesion (right basal ganglia; red arrow) with central necrosis and massive perifocal edema. The corresponding ¹⁸F-FET PET scan shows low ¹⁸F-FET uptake at the level of background activity (TBR_{max} of 1.6). A stereotactic biopsy was performed and histology revealed a mycotic brain abscess.



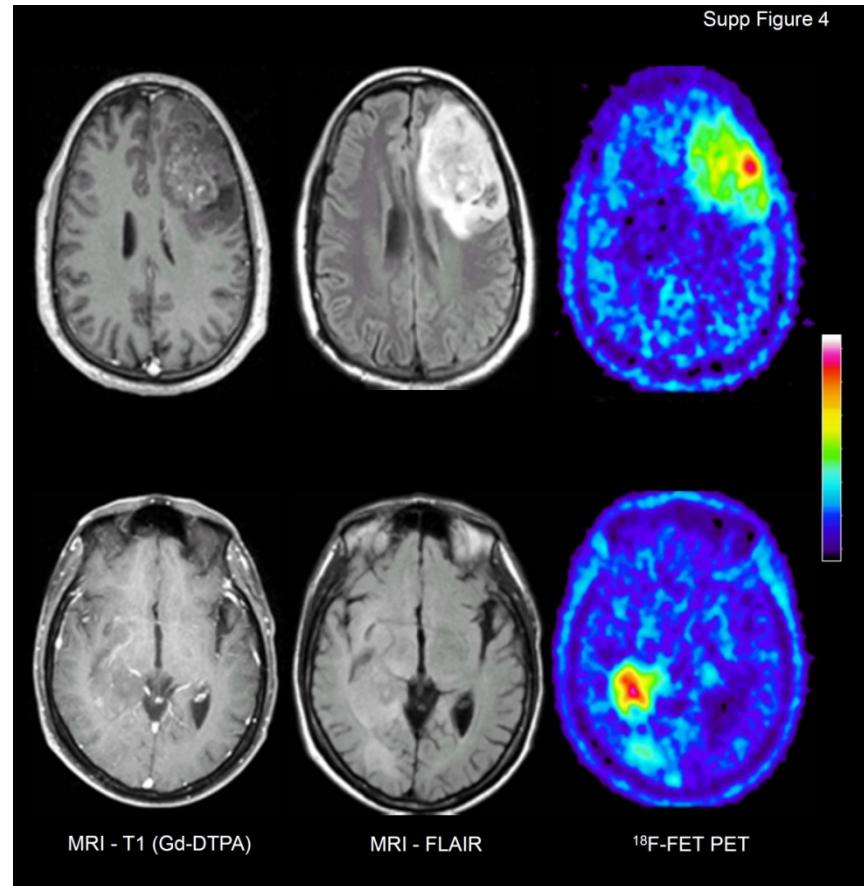
Supp. Fig. 2: *Top:* Images of a 49-year-old female (pat. no. 28) with newly diagnosed epileptic seizures. The MRI showed a diffuse, non-space occupying, small bifrontal lesion without any contrast-enhancement and focally increased ^{18}F -FET uptake (TBR_{\max} of 2.3) in the corresponding PET scan. Histology of stereotactic biopsy specimens revealed only unspecific gliotic tissue. *Bottom:* After 16 months, the patient suffered from rapid clinical deterioration. Follow-up MRI showed a large, perifocal edema with mass effect and ring-enhancing contrast-enhancement with central necrosis. The corresponding PET scan revealed an increased ^{18}F -FET uptake (TBR_{\max} of 2.6) in spatial correspondence to contrast-enhancement on MRI. The lesion was neurosurgically resected and a glioblastoma (WHO grade IV) confirmed by histology.

Supp Figure 3



Supp. Fig. 3: Differences of ^{18}F -FET uptake in patients with diffuse glioma WHO grade II. *Top (A)*: 29-year-old female with a right hemispheric astrocytoma WHO grade II (pat. no. 59). The MRI showed a large, circumscribed lesion without contrast-enhancement. The corresponding ^{18}F -FET PET scan demonstrated low ^{18}F -FET uptake at the level of background activity (TBR_{\max} of 1.2). *Middle (B)*: 38-year-old male with a left frontal oligoastrocytoma WHO grade II (pat. no. 104). The MRI revealed a small, relatively diffuse, and contrast-negative lesion with moderately increased ^{18}F -FET uptake (TBR_{\max} of 1.8) in the corresponding PET scan. *Bottom (C)*: 36-year-old female with a right frontal oligodendrogloma WHO grade II (pat. no. 46). The MRI showed a circumscribed and non-enhancing lesion with increased ^{18}F -FET uptake (TBR_{\max} of 3.0) in the corresponding PET scan.

Supp Figure 4



Supp. Fig. 4: Patients with high-grade glioma and ambiguous MRI findings. *Top:* 49-year-old female with a left frontal anaplastic oligodendrogloma WHO grade III (pat. no. 126). MRI showed a large, inhomogeneous contrast-enhancing lesion. The hyperintensity of the FLAIR-weighted image is almost in spatial correspondence with the area of increased ¹⁸F-FET uptake. In addition, the ¹⁸F-FET PET scan revealed subareas with focal highly increased ¹⁸F-FET uptake (lateral portion of the tumor, TBR_{max} of 4.7). *Bottom:* 64-year-old male with a right temporo-occipital glioblastoma WHO grade IV (pat. no. 159). T1 weighted MRI shows a diffuse and only focally contrast-enhancing lesion with highly increased ¹⁸F-FET uptake (TBR_{max} of 3.6) in the corresponding PET scan. The FLAIR-weighted image reveals no well-defined hyperintensity.