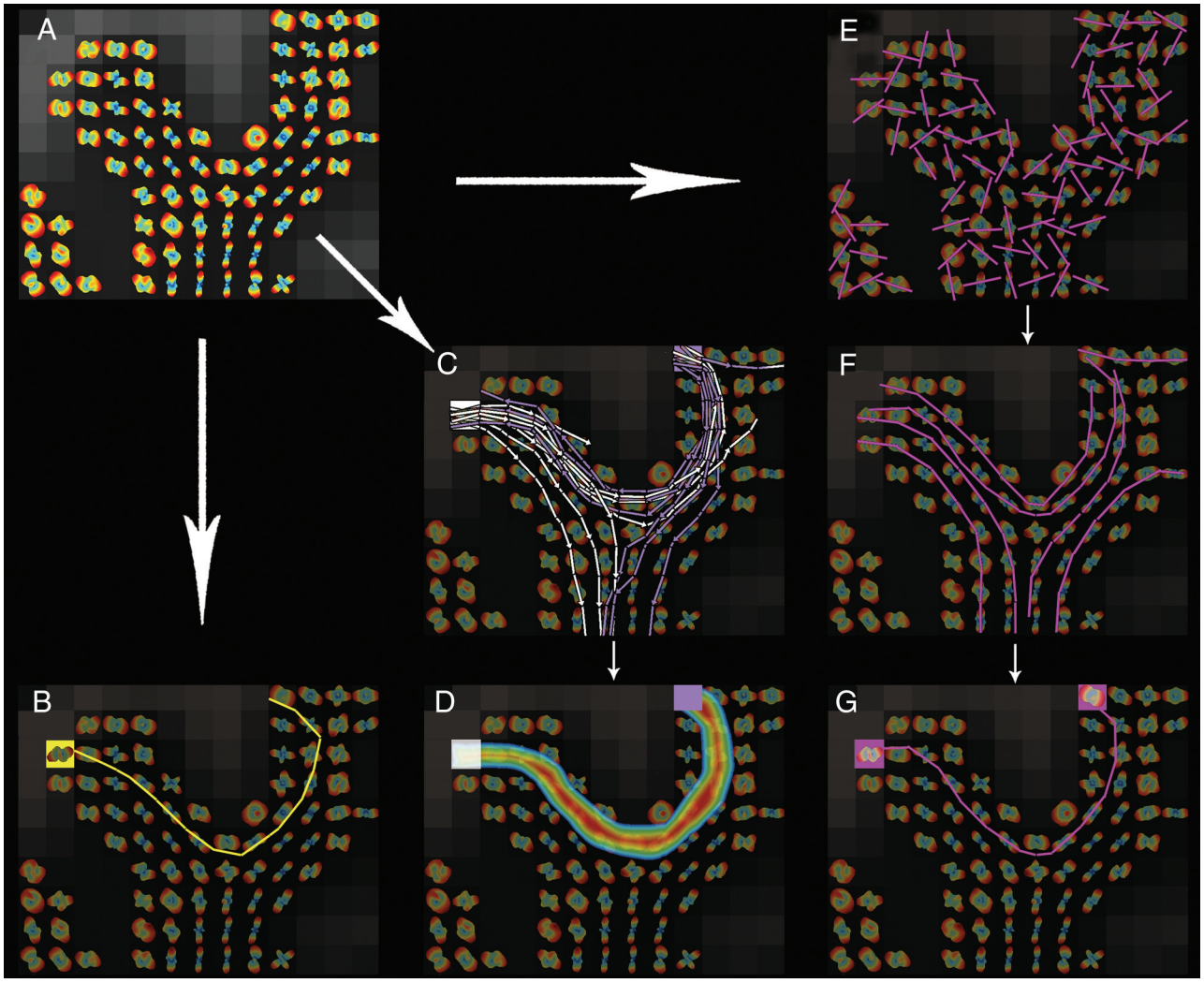
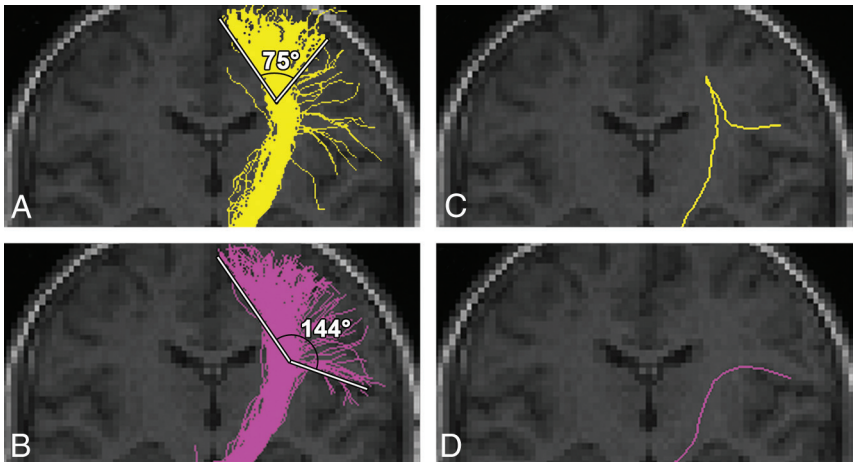


ON-LINE FIG 1. Diffusion tractography of short association fibers by different algorithms. Detail of a juxtacortical area of the human brain. The diffusion signal in each voxel is depicted by an orientation distribution function (*A*). The FACT algorithm is starting from a selected voxel (*yellow rectangle*) and propagates to the next voxel along the principal orientation of diffusion (*B*). Probabilistic algorithm curves originate from selected voxels (*white and purple*) and are spread by random walks throughout the diffusion data (*C*). The probabilistic map of connectivity depicts the most probable mathematic pathway between the 2 voxels (*D*, *red: high probability, cyan: low probability*). In global tracking, the diffusion information is represented first by linear segments (*E*), which are then aligned together by means of a "virtual annealing" procedure (*F*). In the postprocessing step, the postulated pathway is delineated by those fibers that pass through both selected voxels (*G*, *magenta rectangle*).



ON-LINE FIG 2. Depiction of the left descending motor pathways on the healthy side in patient 3. Fibers arising from the face area of the precentral gyrus crossing the SLF are shown for FACT (*A* and *C*) and global tracking (*B* and *D*). Note the smooth route of 1 selected fiber reconstructed by global tracking (*D*), in contrast to the false-positive fiber course reconstructed by the FACT algorithm, which does not overcome the crossing and follows an anatomically aberrant path.

On-line Table: Clinical characteristics, identified fiber pathways, and postoperative outcome of the 20 patients

Pt #	Sex, Age (y)	Seizure Type	Lesion Location and Size (Max Diameter Given in cm)	Histologic or Neuroradiologic Diagnosis	Identified Fiber Pathway	Postoperative Outcome According to Engel[13] and ILAE Classifications[14]
1	Male, 3	Simple partial	Left postcentral gyrus (3.1)	Oligodendroglioma, WHO grade II	DMP	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
2	Male, 15	Simple partial, generalized tonic-clonic	Left middle frontal gyrus, next to precentral gyrus (2.0)	Focal cortical dysplasia, Palmini 2a[25]	DMP	Less frequent seizures (Engel: IIb,[13] ILAE: 3[14])
3	Female, 12	Complex partial	Right postcentral gyrus (3.5) and posterior semiovale center	Astrocytoma, WHO grade II	DMP	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
4	Female, 31	Complex partial	Right postcentral sulcus (2.9)	Arteriovenous malformation	DMP	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
5	Male, 47	Simple and complex partial	Left cingulate gyrus (3)	Cavernoma	DMP	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
6	Female, 66	Simple and complex partial	Left insular lobe (1.2)	Cavernoma	DMP	Less frequent seizures (Engel: IIb,[13] ILAE: 3[14])
7	Female, 19	Simple partial	Left thalamus and insula (2.5 and 1.8)	Cavernoma	DMP	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
8	Male, 36	Simple partial, generalized tonic-clonic	Right middle frontal gyrus (3.0)	Imaging suspected focal cortical dysplasia	DMP	No operation; DMP close to lesion
9	Male, 28	Simple partial, generalized tonic-clonic	Right frontal lobe	Neuroradiologic diagnosis of closed-lip schizencephaly	DMP	No operation; motor area in epileptogenic area
10	Female, 36	Simple and complex partial	Left precentral gyrus (1.4)	Neuroradiologic diagnosis of focal cortical dysplasia	DMP	No operation; DMP close to a transmantle extension
11	Female, 31	Complex partial, generalized tonic-clonic	Right medial occipital gyrus (1.3)	Focal cortical dysplasia, Palmini 2b[25]	OR	Less frequent seizures (Engel: IIIa,[13] ILAE: 4[14])
12	Female, 17	Simple partial, upper right quadrant anopia	Left lingual gyrus (1.9)	Cavernoma	OR	Seizure-free (Engel: Ib,[13] ILAE: 2[14]); persisting upper right quadrant anopia
13	Male, 51	Complex partial, generalized tonic-clonic	Right hippocampus and temporal lobe	Hippocampal sclerosis and focal cortical dysplasia, Palmini 1a[25]	OR	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
14	Male, 40	Simple and complex partial	Right hippocampus	Hippocampal sclerosis	OR	Less frequent seizures (Engel: Ib,[13] ILAE: 3[14]); left upper visual field defect
15	Female, 9	Simple and complex partial	Left perisylvian and insular cortex	Perinatal infarction	OR	Seizure-free (Engel: Ia,[13] ILAE: 1[14]); lower right quadrant anopia
16	Female, 6	Simple and complex partial	Right occipital-temporal lobe (0.8)	Cavernoma	OR	Less frequent seizures (Engel: IIIa,[13] ILAE: 4[14])
17	Male, 18	Simple and complex partial	Left occipital-temporal area (2.6)	Dysembryoplastic neuroepithelial tumor	OR	Seizure-free (Engel: Ia,[13] ILAE: 1[14])
18	Male, 14	Generalized tonic-clonic	Left precuneus and cuneus (4.3)	No histologic classification possible	OR	Less frequent seizures (Engel: IIIa,[13] ILAE: 5[14])
19	Female, 27	Simple partial	Right occipital-temporal area (2.8)	Imaging suspected focal cortical dysplasia	OR	No operation; epileptogenic area adjacent to OR
20	Female, 28	Complex partial	Right occipital-temporal area (1.7 cm)	Imaging suspected focal cortical dysplasia	OR	No operation; epileptogenic area adjacent to OR

Note:—ILAE indicates International League Against Epilepsy; WHO, World Health Organization.