

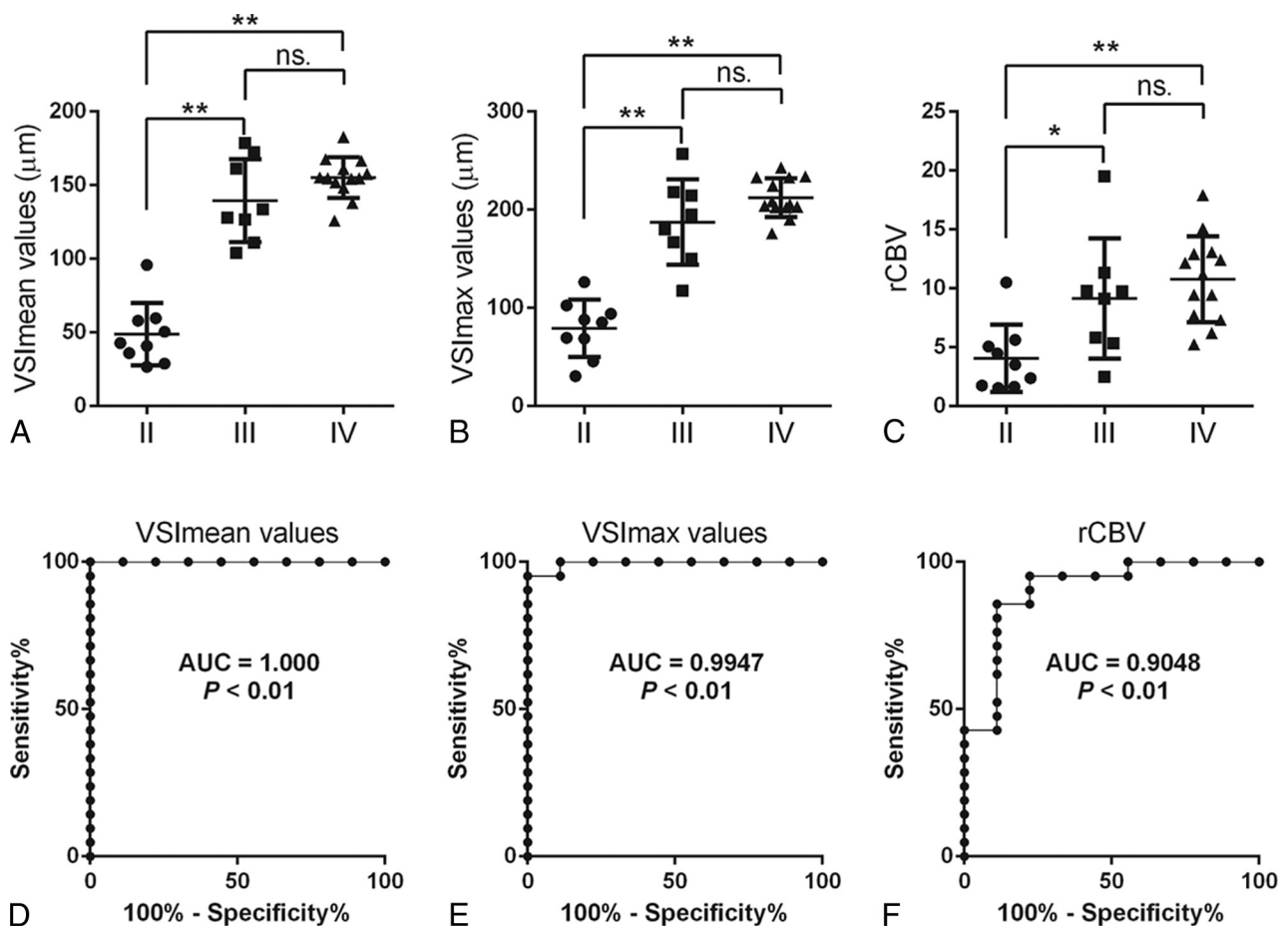
## ON-LINE APPENDIX

### Materials and Methods

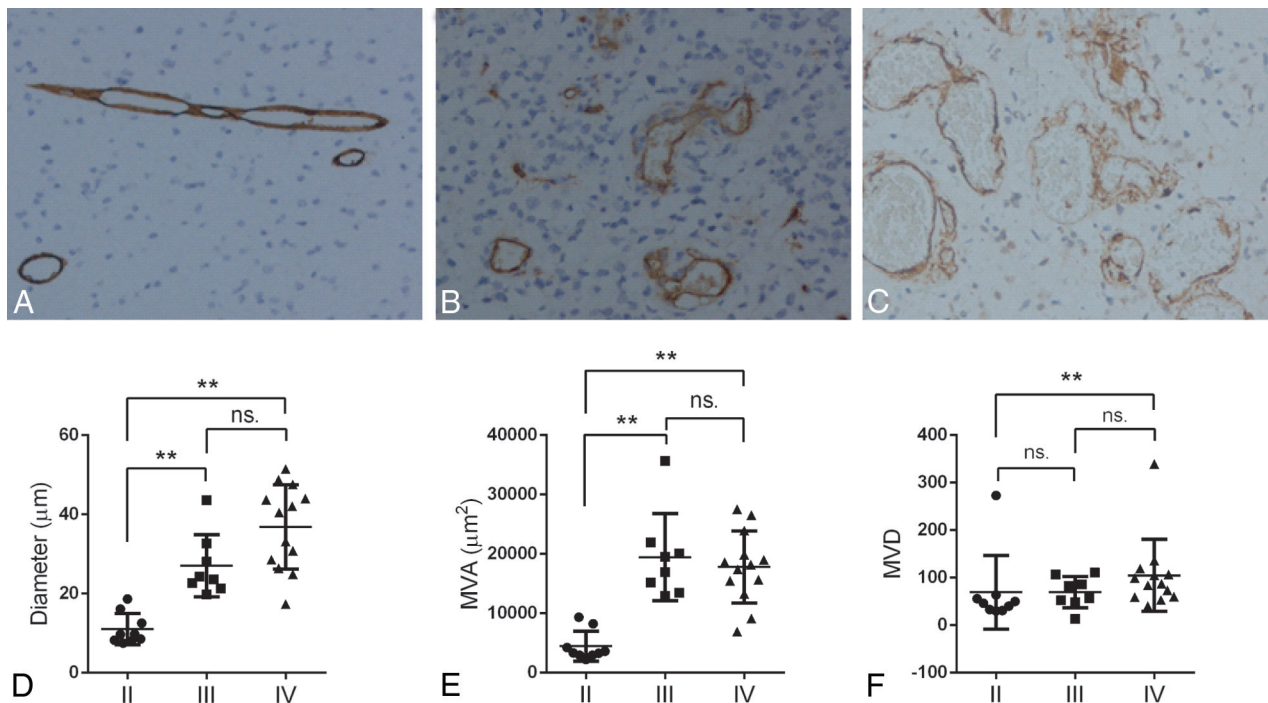
**MR Imaging.** The conventional MR imaging protocol included axial T2-weighted fast spin-echo (TR/TE, 4900/96 ms; matrix size, 320 × 288), FLAIR (TR/TE, 8000/94 ms; TI, 2371.5 ms; matrix size, 256 × 256), and axial T1-weighted gradient-echo sequences (TR/TE, 250/2.67 ms; matrix size, 320 × 256) performed before and after intravenous administration of gadolinium-DTPA (Magnevist, Bayer-Schering). All data were obtained by using

5-mm-thick sections with a 1-mm skip, an FOV of 23 × 23 cm, and a flip angles of 150°.

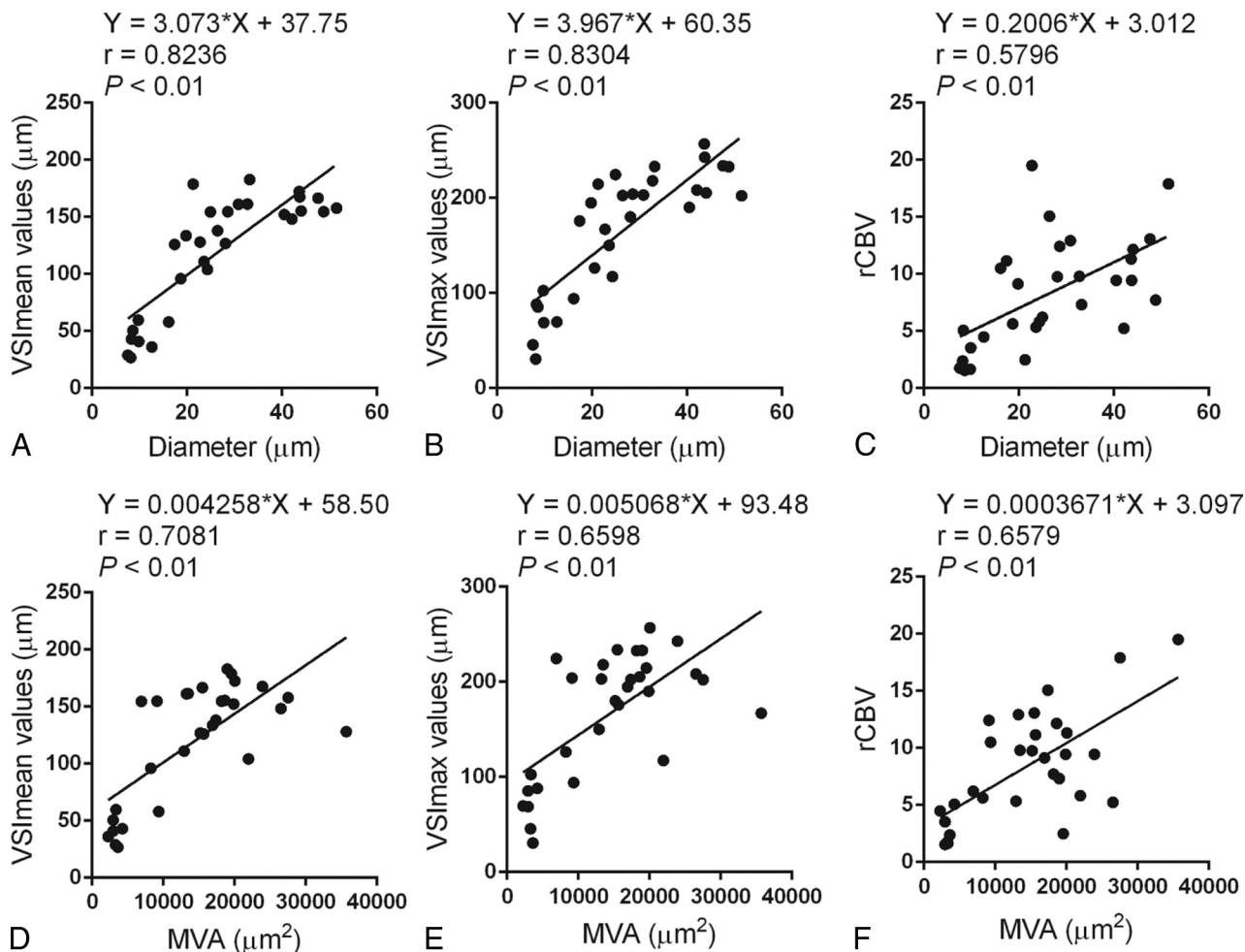
DWI was performed before administration of contrast medium by using a single-shot spin-echo echo-planar imaging sequence. The imaging parameters were as follows: TR/TE, 6600/100 ms; FOV, 23 × 23 cm; a matrix of 192 × 192; b-values of 0 and 1000 seconds/mm<sup>2</sup>; and 3 spin-echo images diffusion-weighted in the 3 principal directions of the gradient system.



**ON-LINE FIG 1.** VSI value and rCBV of 3 different grades of tumors. Comparison of glioma tumors of grade II, III, or IV according to VSI and rCBV. The scatterplots show the VSI<sub>max</sub> value (A), the VSI<sub>mean</sub> value (B), and rCBVmax (C). The middle lines in the plots indicate the median values. \*\* indicate  $P < .01$ ; \*,  $P < .05$ ; ns., no significance. Receiver operating characteristic curves show the VSI<sub>mean</sub> values (D), the VSI<sub>max</sub> values (E), and rCBV (F) comparing patients with HGGs with those with LGGs.



**ON-LINE FIG 2.** Photomicrographs (CD34 staining) of histologic sections ( $\times 200$ ) and results of statistical analysis of 3 different grades of tumors. Photomicrographs of a histologic section of a grade II glioma show the small diameter of the microvessel (A), grade III glioma shows a larger diameter (B), and grade IV glioma shows a very large and highly irregular microvessel (C). The scatterplots show a comparison of the diameter (D), MVA (E), and MVD (F) of grade II, III, or IV glioma. The *middle lines* in the plots indicate the median values. *Double asterisks* indicate  $P < .01$ ; *single asterisk*,  $P < .05$ ; *ns.*, no significance.



**ON-LINE FIG 3.** Correlations between MR imaging (VSI values and rCBV) and tumor histology (vessel diameter, MVA, and MVD). Significant correlations were observed between microvessel diameter and VSI<sub>mean</sub> values (A), microvessel diameter and VSI<sub>max</sub> values (B), microvessel diameter and rCBV (C), MVA and VSI<sub>mean</sub> values (D), MVA and VSI<sub>max</sub> values (E), and MVA and rCBV (F).

**On-line Table: Clinical features of the patients with gliomas**

Variable	Group 1	Group 2	Group 3
Sex			
Male	15	8	9
Female	15	12	11
Age			
Median (yr) (range)	42 (18~79)	53 (31~69)	45 (26~85)
Histology			
Diffuse astrocytoma	3	5	4
Oligodendroglioma	5	1	3
Oligoastrocytoma	1	0	1
Anaplastic oligodendroglioma	3	4	1
Anaplastic oligoastrocytoma	2	0	0
Anaplastic astrocytoma	3	2	5
Glioblastoma	13	8	6