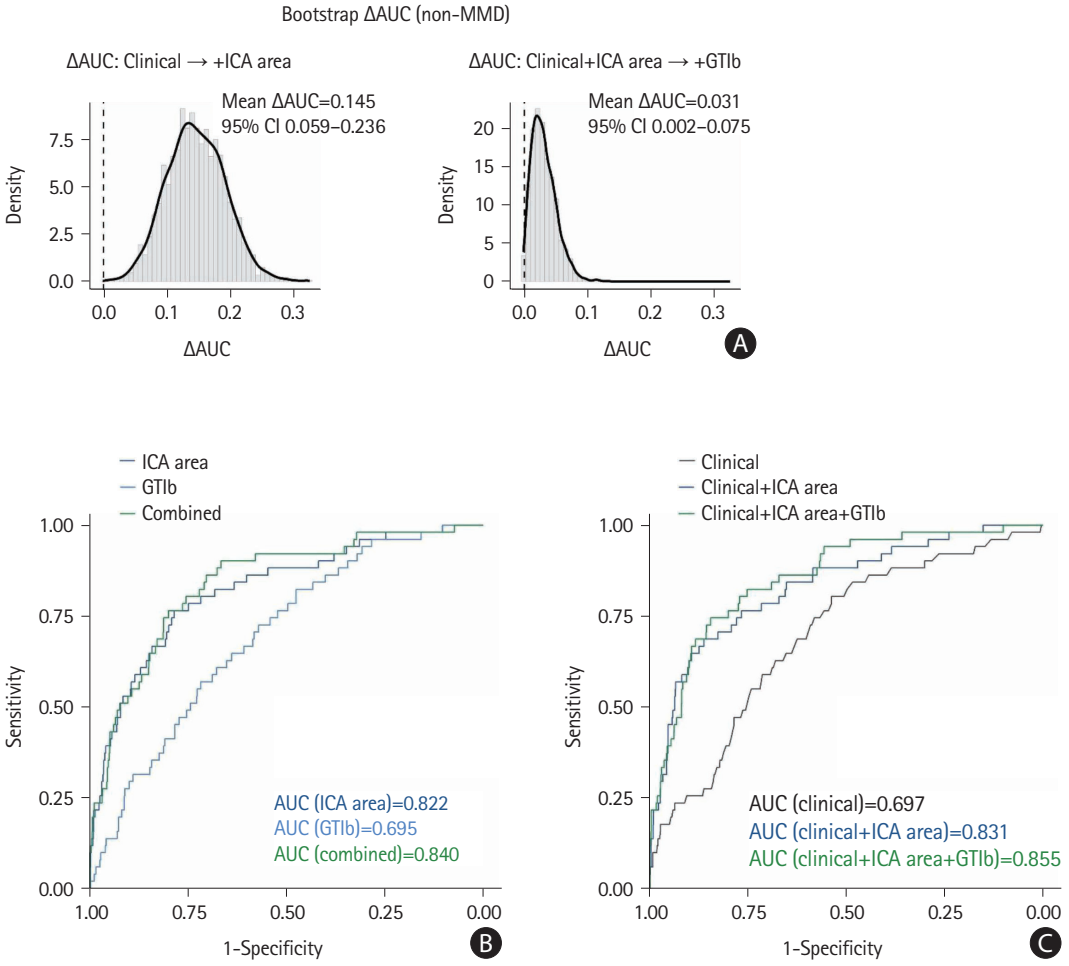


**Supplementary Figure 5.** Bootstrap ΔAUC analyses for the non-MMD cohort and ROC curves for the overall population. (A) Bootstrap distributions of the incremental change in the AUC (ΔAUC) within the non-MMD cohort. The left panel illustrates the ΔAUC associated with adding ICA area to the clinical model, while the right panel illustrates the ΔAUC associated with adding GTIb to the clinical plus ICA area model. Solid lines represent kernel density estimates, and dashed vertical lines indicate the null hypothesis (ΔAUC=0). (B and C) ROC curves illustrating the discriminative performance of cerebrovascular geometric features for identifying *RNF213* variant carriers. (B) Unadjusted ROC curves derived from the overall study population. The curves depict the diagnostic performance of ICA area (dark blue), GTIb (light blue), and the combined logistic regression model incorporating both ICA area and GTIb (green). (C) Adjusted ROC curves derived from multivariable logistic regression models including clinical covariates (age, sex, and stroke etiology [large artery atherosclerosis vs. non-large artery atherosclerosis]). The models represent the clinical model alone (black), clinical model plus ICA area (blue), and clinical model plus ICA area and GTIb (green). AUC, area under the curve; MMD, moyamoya disease; ICA, internal carotid artery; GTIb, basal global tortuosity index; CI, confidence interval; ROC, receiver operating characteristic.