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Original Article

A Novel Ultrasound-Based Carotid Plaque Risk Index Associated with the Presence of Cerebrovascular Symptoms

Ein neuer ultraschallbasierter Karotis-Plaque-Risikoindex ist assoziiert mit dem Auftreten zerebrovaskulärer Symptome

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Abstract

Purpose: The purpose of this study was to determine the efficacy of a novel ultrasound-based carotid plaque risk index (CPRI) in predicting the presence of cerebrovascular symptoms in patients with carotid artery stenosis.

Materials and Methods: This was a cross-sectional, observational study involving 56 patients (mean age 76.6 years, 62.5% male). Plaque grayscale median (GSM) and surface irregularity indices (SII) were measured in 82 stenosed carotid arteries (range 10–95%) and combined with the degree of stenosis (DOS) in the form of (DOS*SII)/(1+GSM). A reduced index DOS/(1+GSM) not incorporating plaque surface irregularities was also investigated. Receiver operating characteristic curves (ROC) were used to study the diagnostic efficacy of CPRI, comparing against DOS and an equivalent risk index constructed using a conventional logistic regression based method with model parameters optimized to the dataset ($CPRI_{logistic}$).