Voxel-Based Wall Enhancement Quantification Improve Symptomatic Stratification in Fusiform Aneurysms

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1. Introduction

- Fusiform intracranial aneurysms (FIAs) display different aneurysm wall enhancement (AWE) patterns, and its potential for risk stratification remains underexplored.

2. Methods

- FIAs were prospectively imaged with a 3T HR-MRI.
- Symptomatic FIAs: 1) cranial nerve palsy 2) hydrocephalus 3) symptomatic compression.
- AWE distribution was quantified using an in-house MATLAB code.
- Mean signal intensity (SI) on post-contrast after SI normalization to the corpus callosum was calculated (3D-AWE: SI of the aneurysm body/SI of the corpus callosum, figure 1).
- 3D-AWE maps were correlated with areas causing compression (figure 2).
- SI was quantified in these regions (Regional AWE: SI of the aneurysm region/SI of the corpus callosum).

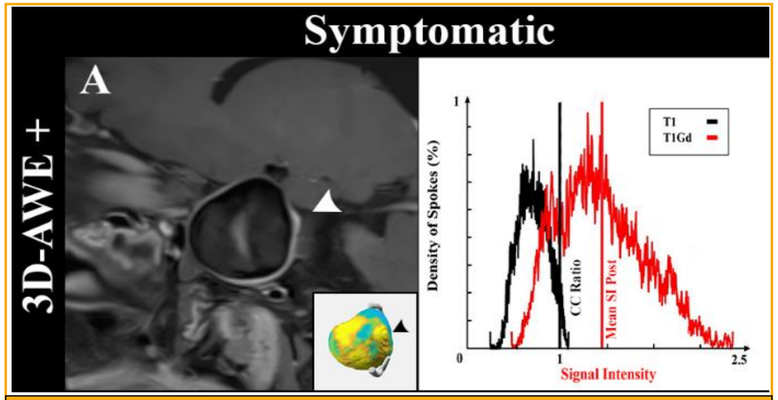


Figure 1. 3D-AWE quantification in symptomatic FIAs

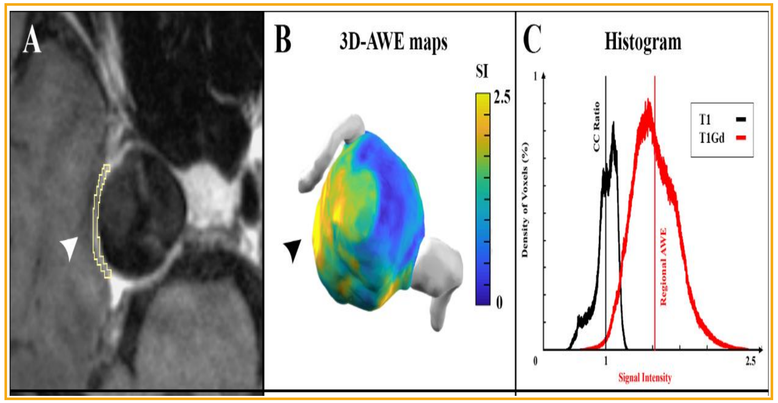


Figure 2. Regional AWE quantification in FIAs

3. Results

- Forty-eight FIAs, 16 (33%) were symptomatic
- Factors associated with symptomatic presentation: female sex (OR 4.58, *p 0.027*), larger size (OR 1.38, *p 0.002*), 3D-AWE (OR 8.17, *p 0.002*) and regional AWE (OR 24.8, *p 0.011*).

AWE-metrics	Symptomatic (16)	Asymptomatic (32)
3D-AWE	1.18 ± 0.34	0.82 ± 0.23
Regional AWE	1.37 ± 0.32	0.92 ± 0.27

P < 0.05

- Combining aneurysm size and AWE metrics yielded an AUCs of 0.87 for size and 3D-AWE, and 0.91 for size and regional AWE.

4. Conclusion

- **AWE patterns in FIAs** can provide additional insights for risk stratification.

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