Subjective Adjudication Compared to Objective Quantification of Plaque Enhancement

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1. Introduction

- Intracranial plaque enhancement (IPE) is assessed by comparing pre- and post-contrast sequences, an approach prone to human error.

2. Methods

- Patients with intracranial atherosclerotic stroke were prospectively imaged using 7T HR-MRI
- **Subjective assessment**
  - Two adjudicators
  - Positive adjudication: degree of IPE exceeded that of the pituitary stalk, with discrepancies resolved by an experienced neuroradiologist.
- **Objective assessment**
  - IPE distribution was normalized to the corpus callosum using an in-house voxel-based algorithm.
  - The normalized mean IPE on post-contrast T1 MRI was defined as the mean enhancement ratio (MER), with a plaque classified as objectively "enhancing" if the MER was greater than one.

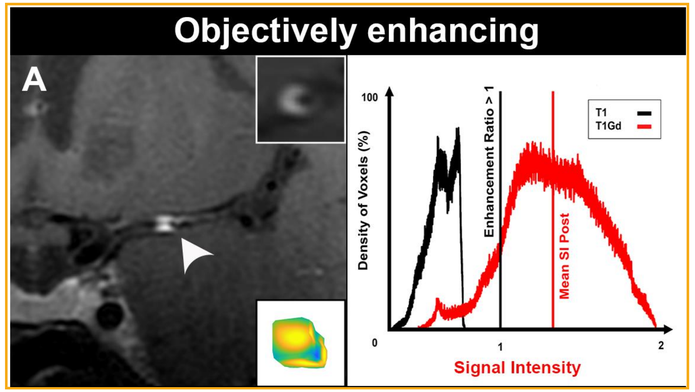


Figure 1. Positive Visual Enhancement Adjudication compared to Positive Objective IPE

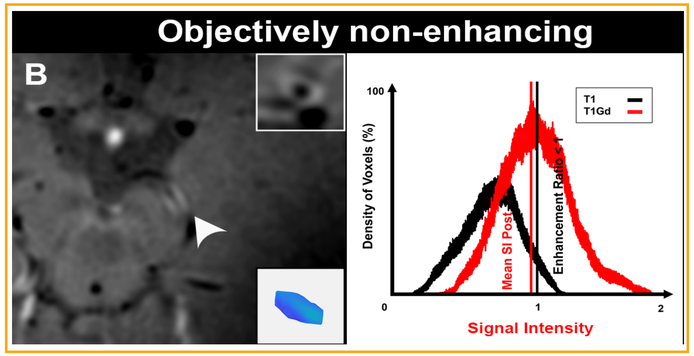


Figure 2. Positive Visual Enhancement Adjudication compared to Negative Objective IPE

3. Results

- Inter-rater agreement for IPE adjudication was poor (κ = 0.34).
- The agreement between subjective and objective IPE assessments was moderate (κ = 0.40, *p* < *0.001*).

	Objective quantification	
Subjective adjudication	**MER+**	**MER -**
Enhancing	23	9
Non-enhancing	14	29

- Subjective IPE adjudication was less reliable for plaques with <50% stenosis (OR, 1.04, *p* = *0.02*), negative remodeling (OR, 2.20, *p* = *0.021*), and those located in the posterior circulation (OR, 0.23, *p* = *0.018*).

4. Conclusion

- **Subjective IPE** achieved poor inter-rater reliability.
- **Objective IPE** is valuable for evaluating non-stenotic, negative remodelling and posterior circulation plaques.

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