



# Quantitative MRI Biomarkers for Differentiating Parotid Tumor Types

Alavanja, A; Hasse A; Jeong Y; Carroll T; Ginat DT  
Department of Radiology, The University of Chicago

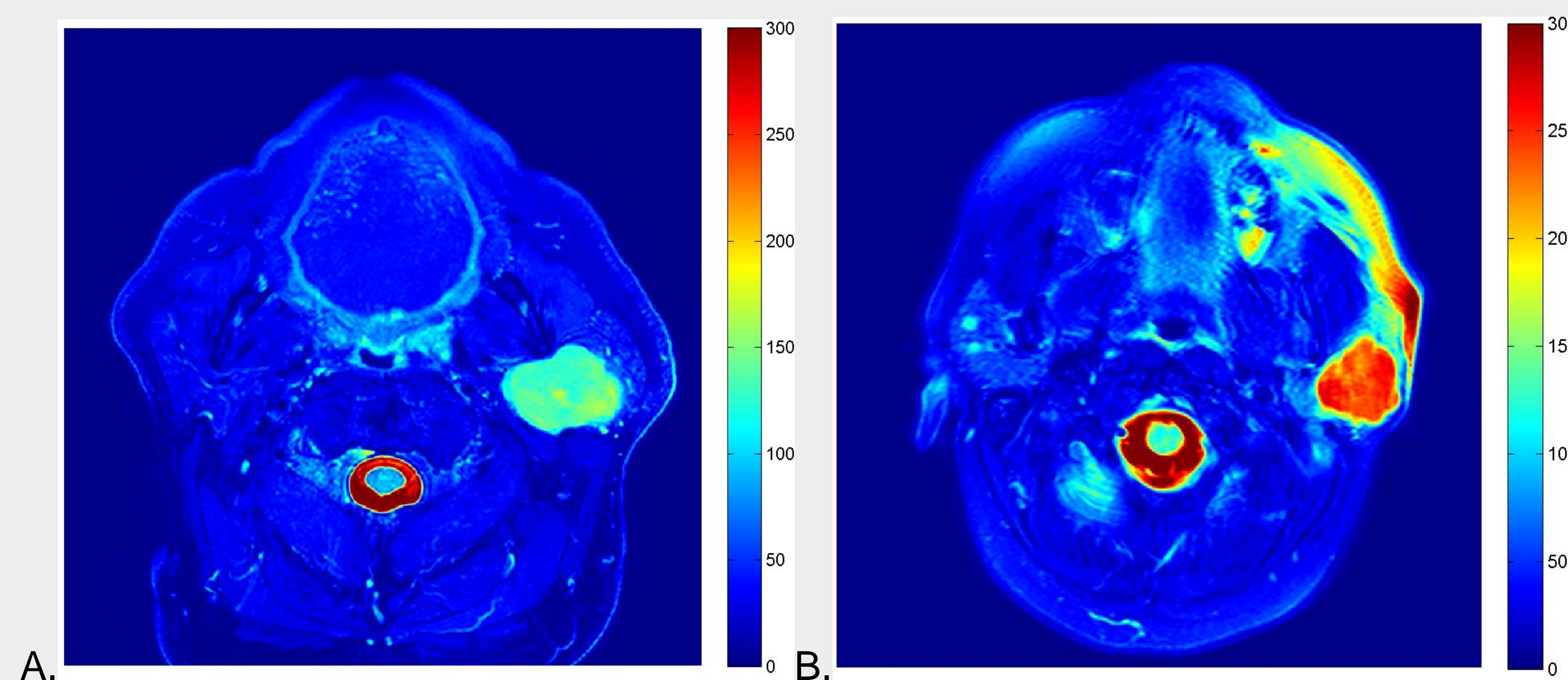
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## Objective

Differentiating among the different types of parotid tumors on imaging is useful for guiding surgical management. The goal of this study was to determine whether quantitative T2 signal characteristics and morphologic features on MRI can serve as predictive biomarkers.

## Methods

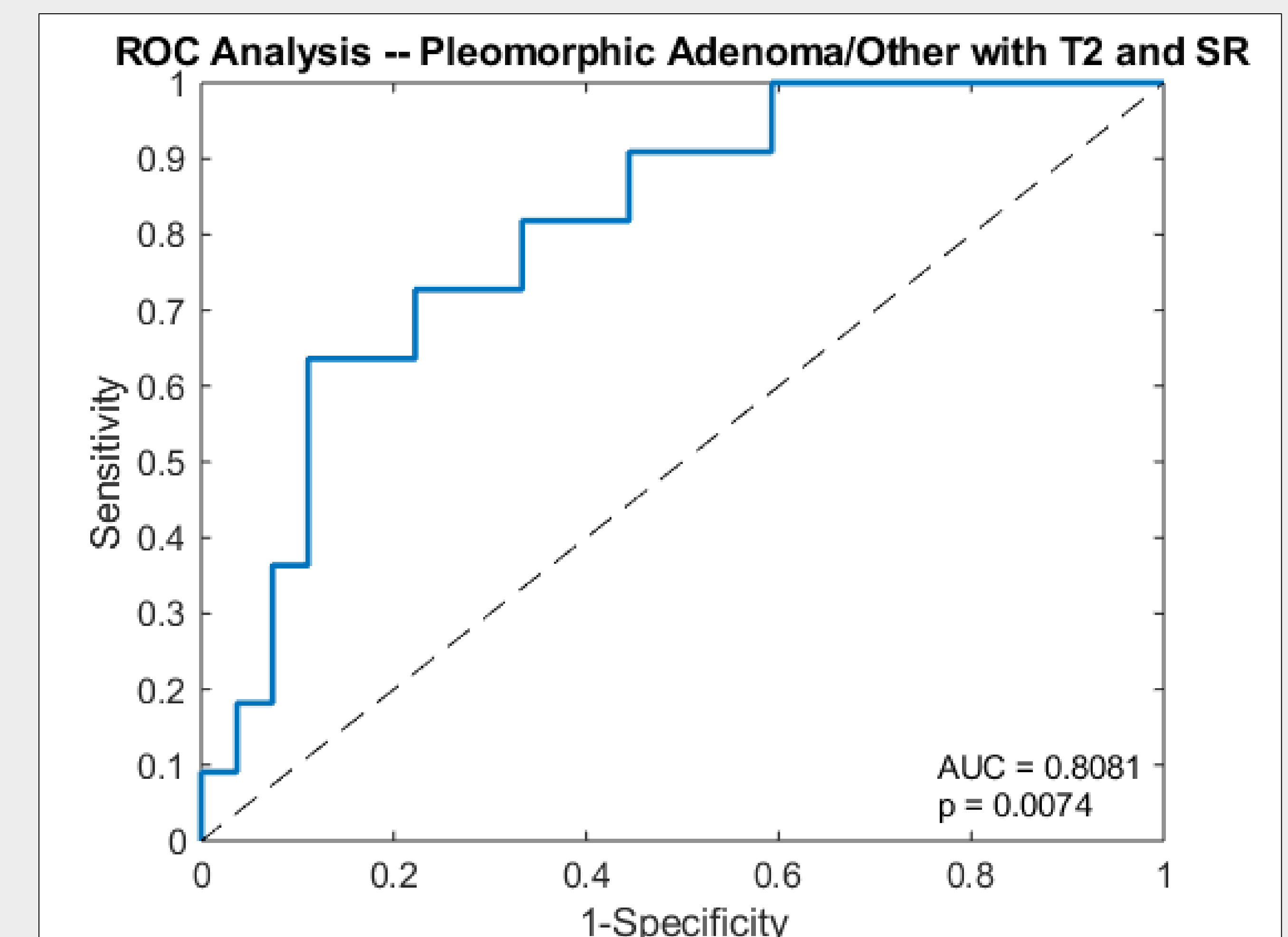
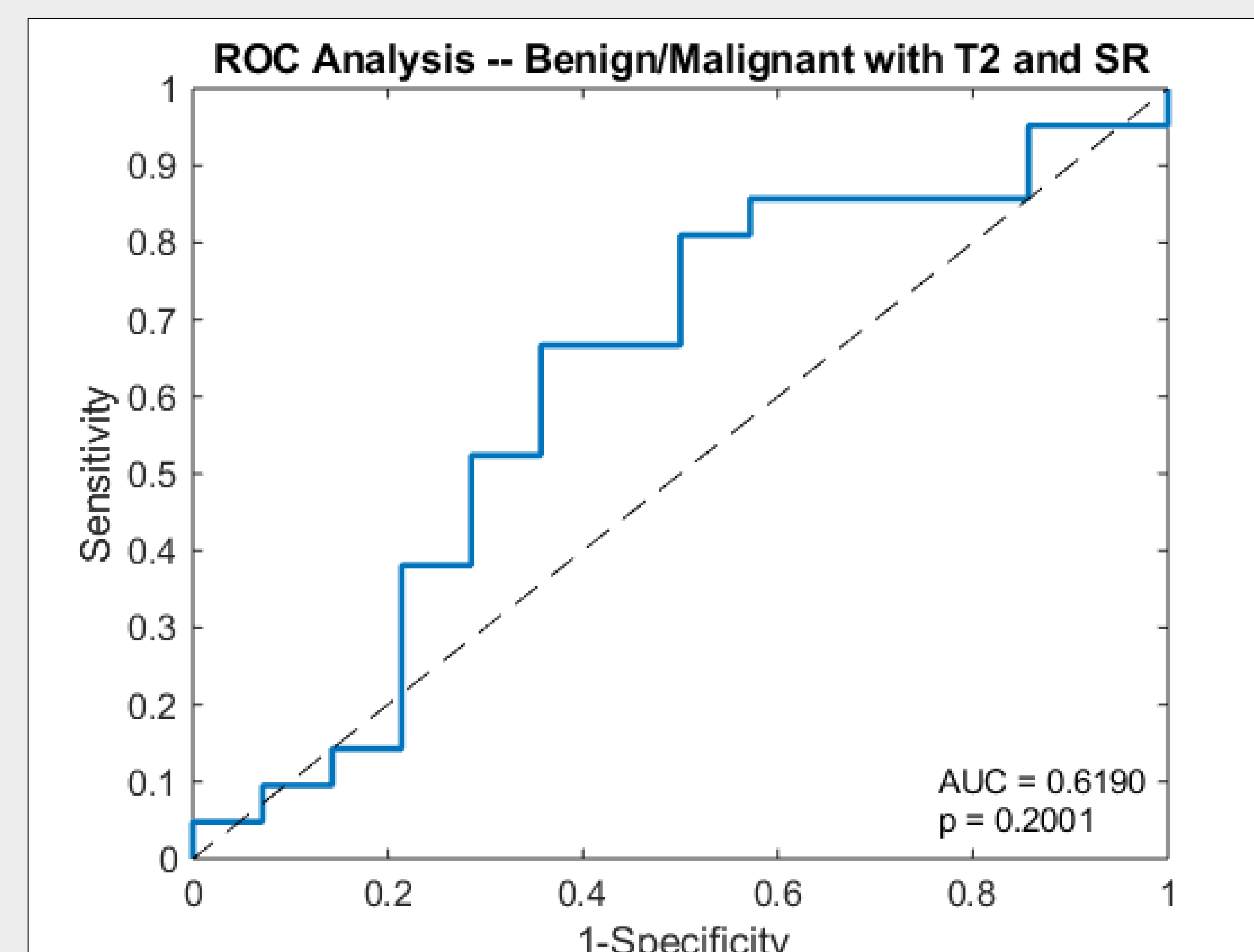
A retrospective review of T2-weighted MRIs in patients with pathology-proven parotid tumors was performed. Quantitative T2 maps and surface regularity measurements of the tumors were obtained via semi-automated regions of interest. Linear Discriminant Analysis was used to populate the receiver operating characteristics (ROC) curves for these variables. A p-value of  $<0.05$  was considered to be significant.



Quantitative T2 heat maps of (A) adenoid cystic carcinoma, and (B) pleomorphic adenoma.

## Results

A total of 35 tumors (21 benign, including 11 pleomorphic adenomas, and 14 malignant tumors) were included in this analysis. For differentiating the benign versus malignant classes of parotid tumors, T2 signal and surface regularity combined yielded an area under the curve of 0.62 (p-value: 0.2) through the ROC analysis. However, for the pleomorphic adenomas versus other types of parotid tumors, using both T2 signal and surface regularity yielded an area under the curve of 0.81 (p-value: 0.007) through the ROC analysis.



## Discussion

T2 signal and surface regularity combined can significantly differentiate pleomorphic adenomas from other types of parotid tumors and can potentially be used as a predictive imaging biomarker. While these quantitative features were not found to significantly differentiate benign from malignant parotid tumors, there was a promising trend that was limited likely due to the small sample size. Thus, further evaluation of this technique is warranted in a larger cohort.