MP50-06: Utilization of Radiomic Markers in Localized Renal Cell Carcinoma To Predict Stage

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- **Purpose:** To evaluate whether any radiomic features were associated with pathologic upstaging following PN for cT1 renal masses
- Two different stages of renal lesions were matched 2:1 (Stage T1: Stage T3a) by tumor diameter and patient age
- Lesions were segmented using an Auto-Initialized Cascaded Level Set (AI-CALS)
- 49 radiomic descriptors including morphological features (i.e. volume and shape) and gray level features (i.e. intensity) were extracted from the segmented lesions
- A model using automatic feature selection and linear discriminant analysis classifier was developed and a leave-one-lesion-out cross validation method was used for performance evaluation
Results:

- 2 gray level and 3 morphological features of significance were identified in our predictive model.
- Features related to surface irregularity of the renal mass appeared to be highly predictive in distinguishing between pT1a and pT3a cancers.
- The training AUC was 0.72 and the test AUC was 0.70.
- **Conclusion:** Machine learning techniques show promising results that may be able to provide useful decision support in RCC staging.

![ROC curve](image.png)