Baseline Impedance Measured During High Resolution Manometry Correlates with the Endoscopic Presence and Degree of Esophagitis

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Background

- Detection of esophagitis is crucial particularly grades C and D (as those typically benefit from long term acid suppression and Barrett's esophagus screening).
- Baseline impedance measured during high-resolution impedance manometry (HRIM) showed adequate performance in distinguishing patients with gastroesophageal acid reflux disease (GERD) from controls.
- Hypothetically, this metric might also detect the presence and severity of esophagitis.
- However data on performance in this setting is limited.

Objective

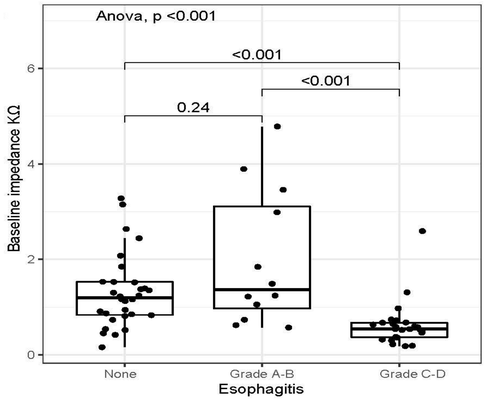
- Evaluate the performance of baseline impedance measured during HRIM in identifying esophagitis in the setting of GERD.

Methods

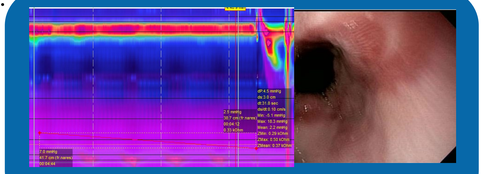
- Retrospective study
- Inclusion: patients with pH study proven GERD, who underwent an upper endoscopy and HRIM at the University of Kentucky between 9/2015 and 10/2021.
- Baseline impedance was calculated using the smart mouse tool as the mean impedance for the 3 cm above the lower esophageal sphincter during the 30 seconds landmark period.
- Esophagitis severity was defined on endoscopy using the Los Angeles classification system.
- The ability of impedance values to detect severe esophagitis was assessed using receiver operator curves (ROC).

Results

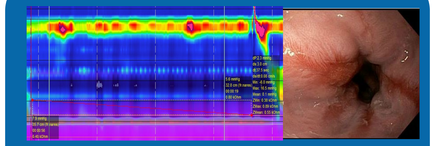
- We included 67 patients (30 with no esophagitis, 2 grade A, 10 grade B, 19 grade C and 6 with grade D esophagitis).



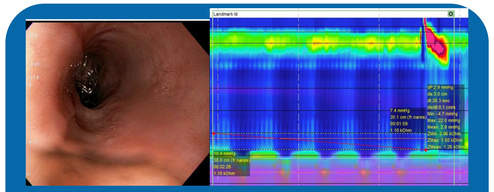
- Baseline impedance was significantly different (overall anova, p < 0.001) between no esophagitis, mild (grade A-B) and severe (grade C-D) esophagitis (being lower as esophagitis severity increases).
- The difference was less pronounced between no vs. mild esophagitis (p=0.24), compared to no vs. severe esophagitis (p< 0.001) and mild vs. severe esophagitis (p< 0.001).



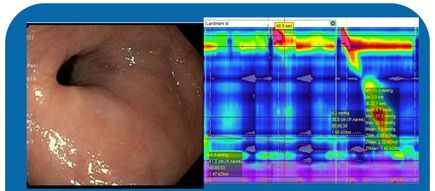
Baseline impedance: 0.37 kOhm



Baseline impedance: 0.55 kOhm

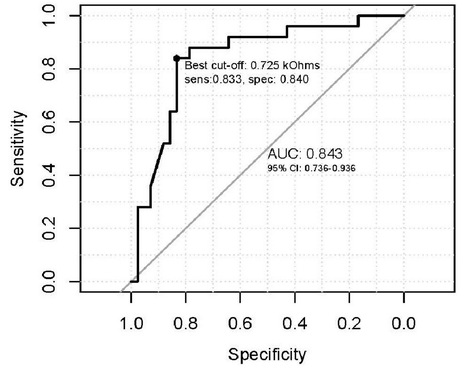


Baseline impedance: **1.26 kOhm**



Baseline impedance: 1.42 kOhm

Results



- Baseline impedance had good ability to discriminate those with severe esophagitis; area under the curve 0.843 (95% CI: 0.736-0.936).
- Using a baseline impedance threshold of 0.725 kOhms, this metric had a sensitivity 83.3%, specificity 84%, and negative predictive value 90% in identifying severe esophagitis.

- The measurements were then independently repeated by three of the study authors, blinded to each other's reading.
- There was a high intra-class correlation coefficient (ICC) 0.87 (95% CI: 0.82-0.91) indicating excellent agreement among operators.

Conclusion

- Baseline impedance measured during HRIM using the described technique had an acceptable performance and reproducibility in assessing the presence and severity of esophagitis.
- After further validation, this can serve as a rapid, less invasive complementary tool in GERD diagnostics.