

Group #30

**Development of an HRIM Analysis System**

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Abstract

Patients with dysphagia frequently report swallowing difficulty despite normal findings on conventional High Resolution Impedance Manometry (HRIM), leaving a significant diagnostic gap. To address this, we developed a biomechanical assessment system that integrates impedance measurements with pressure data to quantify the mechanical work generated by the esophagus during swallowing. HRIM pressure and electrical impedance were evaluated in 10 patients with Eosinophilic Esophagitis (EoE) before and after treatment with Dupilumab. Post treatment analysis revealed significant reductions in esophageal mechanical work particularly in the distal esophagus which corresponded with improvements to patient-reported symptoms and reduction in distal esophageal eosinophil counts. These findings demonstrate that biomechanical HRIM analysis can provide clinically meaningful information beyond standard manometry metrics, offering a more sensitive diagnostic tool for patients whose swallowing dysfunction is not adequately captured by conventional HRIM interpretation alone.