Abstract Submitted
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**Computational device design: measuring esophageal distensibility using EndoFLIP**[1] SHASHANK ACHARYA, Department of Mechanical Engineering, Northwestern University, WENJUN KOU, PETER J. KAHRILAS, JOHN E. PANDOLFINO, Feinberg School of Medicine, Northwestern University, NEELESH A. PATANKAR, Department of Mechanical Engineering, Northwestern University — Characterizing the strength of sphincters in the human body is valuable from a diagnostic and surgical standpoint. We develop a numerical model for the EndoFLIP device (Endolumenal Functional Lumen Imaging Probe) that is crucial to the biomechanical study of the Lower Esophageal Sphincter (LES). The simulations demonstrate how the device operates *in vivo*. From this model, we suggest additional use cases for the device that can give insight into the state of the esophageal wall. Currently, the device measures a single steady quantity (distensibility) that is calculated from pressure and area. Our analysis shows that by capturing and analyzing spatio-temporal pressure variations during peristalsis, the effectiveness of the contractions and health of the surrounding tissue can be quantified. Furthermore, there is an opportunity to validate tissue models by comparing dilation results with clinical data from the device.

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