

## Are Multichannel Intraluminal Impedance Measurements Useful in Esophageal Atresia?

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**Objective:** Patients with esophageal atresia (EA) frequently have esophageal dysmotility and gastroesophageal reflux which is often hard to characterize as these patients are often asymptomatic. Multichannel intraluminal impedance (MII) detects intraesophageal bolus movement. Our aim was to determine if MII is able to effectively detect the retrograde bolus movement (i.e. reflux) in patients with EA.

**Methods:** We reviewed MII tracings and medical records of 20 patients at our institution. Patients were categorized into 3 groups: patients with repaired EA (6), patients with documented gastroesophageal reflux disease (GERD) without EA (7) and patients with normal studies and without EA (7). Diagnostic accuracy of MII and symptom association were measured in the three groups. The baseline amplitudes of all 6 channels of the catheter were compared between the three groups at rest and in the recumbent position. In the subgroup of patients with EA, analysis of the impedance measurements in the 6 individual channels was performed, when the patient was upright.

**Results:** Symptoms of reflux captured by MII were higher in patients with GERD (50%) vs. pts with repaired EA (10%) which was statistically significant ( $p < 0.001$ ). The baseline impedance value at rest in the recumbent position was significantly lower in patients with repaired EA ( $1108 \pm 110 \Omega$ ) compared with patients with GERD ( $3263 \pm 186 \Omega$ ) and controls ( $3219 \pm 200 \Omega$ ) (ANOVA,  $p < 0.001$ ). The comparison of the individual values of the 6 impedance channels in the EA patients showed significant difference between the upper channels (channel 1:  $6007 \pm 1278 \Omega$ ) and the lower channels (channel 6:  $564 \pm 137 \Omega$ ; ANOVA,  $p < 0.001$ ).

**Conclusion:** The low baseline impedance observed in EA appears to impair the capacity of MII to capture the changes associated with reflux in EA patients. This is postulated to be secondary to the poor esophageal function and/or stasis of liquid observed as suggested by the significant difference in impedance values in the upper esophagus vs. the lower esophagus in these patients.