Utility of Intestinal Ultrasound (IUS) and its comparison to other diagnostic modalities in patients with Crohns disease; A Systematic Review and Meta-analysis

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Introduction:

Intestinal Ultrasound (IUS) is a relatively new modality being used for diagnostic purposes in the inflammatory bowel disease world. In the latest studies, IUS has performed comparable to other modalities and also correlates with biochemical disease markers. In our study, we planned to compare the results of this modality compared to other modes.

Methods:

- 17 total studies included for review
- A search was completed through PubMed, Oxford Academic and American Gastroenterology journal.
- Comparison of sensitivity, specificity, and accuracy was done between IUS and other procedures in the studies identified.
- The weighted average of certain variables was calculated during the analysis.

Demographics:

- Sex: N = 964 (46% Female)
- Age: Mean age across all studies, M = 38.80
- All patients had a diagnosis of Crohns disease prior to being evaluated for an acute flare in each study

Results:

	Sensitivity	Specificity	Accuracy
Inflammatory Changes (0=11, 1=4)	0 M = .85, SD = 0.15, N =11 1 M = .80, SD = 0.22, N =4 d = 0.28 (95% CI = -0.87 / 1.45)	0 M = .80, SD = 0.15, N =11 1 M = .67, SD = .02, N =3 d = 0.96 (95% CI = -0.39 / 2.27)	0 M = .80, SD = 0.10, N =5 1 M =78, SD = 0.05, N =3 d = 0.22 (95% CI = -1.22 / 1.65)
Stricture Stenosis (0=8, 1=7)	0 M = .81, SD = 0.19, N =8 1 M = .89, SD = 0.07, N =7 d = -0.51 (95% CI = -1.53 / 0.53)	0 M = .75, SD = 0.15, N =7 1 M = .80, SD = 0.14, N =7 d = -0.33 (95% CI = -1.38 / 0.74)	0 M = .80, SD = 0.09, N =3 1 M = .78, SD = 0.06, N =3 d = 0.22 (95% CI = -1.22 / 1.65)
Abscess (0=11, 1=4)	0 M = .83, SD = 0.17, N =11 1 M = .87, SD = 0.03, N =4 d = -0.28 (95% CI = -1.42 / 0.97)	0 M = .76, SD = 0.13, N =10 1 M = .80, SD = 0.18, N =4 d = -0.27 (95% CI = -1.43 / 0.90)	Not enough data to calculate
Dilation (0=11, 1=4)	0 M = .82, SD = 0.16, N =11 1 M = .91, SD = 0.05, N =4 d = -0.65 (95% CI = -1.81 / 0.54	0 M = .77, SD = 0.14, N =10 1 M = .79, SD = 0.17, N =4 = -0.18 (95% CI = -1.33 / 0.99)	Not enough data to calculate
Fistula Formation (0=8, 1=7)	0 M = .82, SD = 0.19, N =8 1 M = .88, SD = 0.07, N =7 d = -0.45 (95% CI = -1.47 / 0.59	0 M = .74, SD = 0.14, N =8 1 M = .82, SD = 0.15, N =6 d = -0.52 (95% CI = -1.58 / 0.57)	Not enough data to calculate
MRE (0=11, 1=4)	0 M = .86, SD = 0.12, N =11 1 M = .81, SD = 0.22, N =4 d = 0.38 (95% CI = -0.79 / 1.52)	0 M = .79, SD = 0.15, N =11 1 M = .71, SD = 0.08, N =3 d = 0.58 (95% CI = -0.73 / 1.87)	Not enough data to calculate
TransabdUS (0=12, 1=3)	0 M = .82, SD = 0.15, N =12 1 M = .96, SD = 0.05, N =3 d = -1.00 (95% CI = -2.31 / 0.33)	0 M = .75, SD = 0.15, N =11 1 M = .88, SD = 0.06, N =3 d = -1.03 (95% CI = -2.35 / 0.33)	Not enough data to calculate

- Procedural factors which may affect Sensitivity, Specificity, and Accuracy in the IUS procedure were examined if there were at least 3 studies available to make a comparison.
- Stricture Stenosis, abscess, dilation, fistula formation was associated with greater Sensitivity & Specificity in IUS while MRE was assumed with greater Sensitivity and Specificity when not present.
- Effect sizes calculated should be taken with caution due to the small number of studies and the large 95% confidence intervals associated with each effect.

Discussion:

IUS evaluation of CD flare offers an alternative noninvasive modality that is comparable while limiting radiation exposure. This allows providers the ability to monitor for resolution of pathology at bedside as well and status changes during follow up visits. A limitation of this study is the lack of information however it provides a continued area of research.

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