

TRANSFORMING IUS INTERPRETATION: INTEGRATION OF AI MODELS IN INTESTINAL ULTRASOUND IMAGING

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Presentation

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An AI model using convolutional neural networks and automated segmentation achieved 99.1% sensitivity and 94.6% specificity for detecting bowel wall thickening in terminal ileum ultrasound images from Crohn's disease patients, with successful validation on cine-loops.

KEY POINTS

- The model was trained on 2,735 grayscale ultrasound images and cine-loops of the terminal ileum from Crohn's disease patients, divided into training (1980 images), validation (220 images), and test (515 images) sets.
- Performance metrics on the test set were sensitivity 99.1%, specificity 94.6%, accuracy 91.5%, and area under the curve 0.85 for bowel wall thickness detection.
- Validation on 10 independent cine-loops (7 abnormal, 3 normal) demonstrated accurate identification of bowel wall thickening in all abnormal cases and correct classification of all normal cases.
- The model integrates automated segmentation and extends from static images to cine-loop evaluation, enabling real-time and dynamic assessment of bowel inflammation.
- The approach has potential to reduce operator dependency and interobserver variability, making intestinal ultrasound more accessible and reliable for clinicians with varying levels of expertise.
- Prof. Dan Carter disclosed speaker's fees, research support, or consultancy fees from Takeda, Janssen, AbbVie, and Taro.

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