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Summary

# A PROOF-OF-CONCEPT STUDY IN DIFFERENTIATING MUCOSAL AND SUBMUCOSALLY INVASIVE BARRETT'S NEOPLASIA USING A NOVEL DEEP CONVOLUTIONAL NEURAL NETWORK DURING GASTROSCOPY

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UEG Week Copenhagen 2023 | Poster

Oesophagus

October 17, 2023

**A VGG16-based deep neural network trained on 69 images achieved 82% accuracy in staging Barrett's neoplasia as mucosal versus submucosal, performing comparably to expert endoscopists (76% accuracy, p=0.507).**

## KEY POINTS

- The AI system differentiated mucosal neoplasia (LGD, HGD, pT1a) from submucosal invasion (pT1b) with 80% sensitivity and 84% specificity on 68 test images
- Two expert endoscopists who regularly perform Barrett's resections achieved 74% sensitivity, 78% specificity, and 76% accuracy on the same image set
- The model was trained using 69 images selected from 79,159 frames with histological ground truth and leveraged a pre-trained Barrett's detection model
- Authors suggest the system may help guide treatment decisions for endoscopic versus surgical management and assist non-experts with targeted biopsy, though further refinement and validation are needed

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