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Summary

IMPROVING LESION DELINEATION IN BARRETT'S DYSPLASIA WITH SEGMENT-ANYTHING-MODEL 2

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Stomach & H. Pylori | Nurses | Immunology | Endoscopy | Digestive Oncology

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Integration of the Segment-Anything-Model 2 (SAM2) with computer-aided detection significantly improves segmentation of Barrett's dysplastic lesions compared to standard CADe alone, achieving a mean intersection over union of 0.65 and mean Dice coefficient of 0.73 for CADe-prompted SAM2.

KEY POINTS

- CADe-prompted SAM2 segmentation achieved accuracy 0.83, sensitivity 0.89, and specificity 0.64, compared to baseline CADe model accuracy 0.75, sensitivity 0.83, and specificity 0.65 on video frames.
- CADe-prompted SAM2 achieved mean intersection over union of 0.65 and mean Dice coefficient of 0.73, compared to baseline CADe model mIoU of 0.58 and mDice of 0.63.
- Expert-prompted SAM2 achieved the highest performance with accuracy 0.97, sensitivity 0.96, specificity 0.99, mIoU 0.77, and mDice 0.82, suggesting it can enable accurate video annotation with substantially reduced expert input.
- The study evaluated 250 patients with 9,550 test video frames and 191 test images, with dysplasia present in 5,570 frames and 79 images, all annotated by three experts with histological confirmation.
- Enhanced segmentation may assist endoscopists by improving the precision of biopsy targeting and supporting more complete endoscopic resection.

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