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Summary

AUTOMATIC DETECTION OF PROTRUDING LESIONS IN MULTI-BRAND DEVICE-ASSISTED ENTEROSCOPY USING A CONVOLUTIONAL NEURAL NETWORK – A PILOT STUDY

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A retrospective study developed and tested a multi-brand convolutional neural network algorithm for automatic detection of protruding lesions in device-assisted enteroscopy images from 258 exams across three different enteroscopy systems.

KEY POINTS

- The CNN model achieved 92.9% sensitivity, 99.0% specificity, and 98.4% accuracy in detecting protruding lesions including polyps, epithelial tumors, subepithelial lesions, and nodules in 32,043 small bowel images.
- The algorithm analyzed images at approximately 260 frames per second, with an AUC-PR of 1.00, positive predictive value of 89.6%, and negative predictive value of 90.2%.
- The study included three enteroscopy systems: Fujifilm double-balloon (152 exams), Olympus single-balloon (98 exams), and Olympus PowerSpiral Motorized Enteroscope (8 exams), representing the first automatic multi-brand panendoscopic detection study using the PowerSpiral system.
- The training dataset comprised 80% of images, with 3,162 images containing protruding lesions and the remainder showing normal mucosa, and network output was compared to consensus classification.
- This work addresses a gap in evidence for AI technical feasibility and clinical applicability in device-assisted enteroscopy and may be relevant for clinicians interested in AI-enhanced diagnostic yield in panendoscopic evaluation.

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