

ARTIFICIAL INTELLIGENCE-BASED RECOGNITION OF PROCEDURAL PHASES IN ENDOSCOPIC SUBMUCOSAL DISSECTION: A FRAME-BY-FRAME ANALYSIS

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UEG Week Berlin 2025

Poster

Oesophagus

October 6, 2025

A retrospective study developed and validated an artificial intelligence algorithm using video swin transformer architecture to automatically recognize procedural phases in endoscopic submucosal dissection from 49 patient videos containing over 6 million annotated frames.

KEY POINTS

- The AI system achieved an overall F1 score of 0.88 for phase identification across five procedural phases: diagnostics, lesion marking, submucosal injection, dissection, and hemostasis.
- Performance varied by phase, with F1 scores ranging from 0.99 for diagnostics to 0.52 for bleeding management; sensitivity ranged from 0.67 to 1.00 and specificity from 0.88 to 1.00.
- The comparatively lower performance for bleeding phase recognition was attributed to infrequent bleeding episodes in the training dataset, which comprised only full-length videos.
- Authors plan future algorithm development focused on reducing class imbalances through selective annotation protocols.
- This preliminary work may be relevant to those interested in automated quality assessment tools and educational applications for complex endoscopic procedures.

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