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Summary

MACHINE-LEARNING-POWERED ENDOSCOPIC ULTRASOUND DETECTS MORPHOLOGICAL FEATURES FOR PREDICTING MALIGNANCY IN IPMNS: RESULTS FROM THE “IMAGE” STUDY FROM A TERTIARY REFERRAL CENTER

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UEG Week Barcelona 2026 | Presentation

Radiology & Imaging | Pancreas | Endoscopy | Digestive Oncology

October 20, 2026

A machine learning model (IMAGE) integrating multiparametric EUS features predicted high-grade dysplasia or invasive carcinoma in surgically resected IPMNs with an AUROC of 80.5%, outperforming individual EUS domains.

KEY POINTS

- Among 198 patients who underwent surgical resection for IPMN, final histology showed low-grade dysplasia in 36.4%, high-grade dysplasia in 29.8%, and invasive carcinoma in 33.8%.
- Independent predictors of invasive carcinoma on multivariate analysis included duct wall hypo-echogenicity (IE-PD, p=0.03), contrast-enhanced pancreatic duct (CE-PD, p=0.02), intraductal nodule presence (p=0.04) and size (p=0.002), contrast-enhanced intraductal nodules (CE-PDN, p=0.02), intraductal nodule rigidity on elastography (p=0.02), cyst diameter (p=0.003), and mural nodule enhancement (p=0.04).
- The stacked gradient-boosted IMAGE model achieved AUROC of 81.9% in training and 80.5% in testing, demonstrating good discrimination for malignancy.
- Duct-related EUS features outperformed cyst-related features in predicting IPMN malignancy, supporting a more prominent role for advanced EUS in risk stratification.

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