DEEP LEARNING-BASED ENDOSCOPIC ULTRASOUND DIAGNOSIS OF FATTY PANCREAS: AGREEMENT WITH MRI AND PERFORMANCE OF AI MODELS

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EUS showed only fair agreement with MRI (Cohen's κ=0.31) for diagnosing fatty pancreas, with high specificity (91.5%) but low sensitivity (39.9%), while a segmentation-based deep learning model achieved moderate performance (AUC 0.724, sensitivity 90%, specificity 52%).

KEY POINTS

- In 314 patients with both EUS and MRI, EUS demonstrated fair agreement with MRI for fatty pancreas diagnosis (Cohen's κ=0.31), with sensitivity 39.9%, specificity 91.5%, and overall accuracy 66.6%.
- Marked inter-operator variability was observed, with kappa values ranging from 0.06 to 0.82 across endosonographers.
- Agreement was significantly lower in patients with chronic pancreatitis (κ=-0.16 vs 0.34, p=0.03) and tended to be higher in patients with BMI >25 kg/m^2 (κ=0.40 vs 0.20, p=0.05).
- Three deep learning approaches were tested; the segmentation-based ensemble model achieved the best performance with AUC 0.724, accuracy 69.8%, sensitivity 90%, and specificity 52% in the independent test set.
- The study supports the need for more objective and standardized EUS diagnostic criteria and further development of AI-assisted tools to improve reproducibility in fatty pancreas assessment.

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