

Artificial Intelligence–Enhanced Precision in Endoscopic Bariatric Surgery: Emerging Frontiers in Gastrointestinal Surgery and Computational Medicine



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BACKGROUND

Obesity has increased the demand for bariatric interventions. Artificial intelligence (AI) is emerging as a tool to enhance precision and decision-making in endoscopic bariatric surgery. Objective of this study is to To review recent advances in AI applications in endoscopic bariatric surgery and evaluate their impact on procedural precision and clinical outcomes.

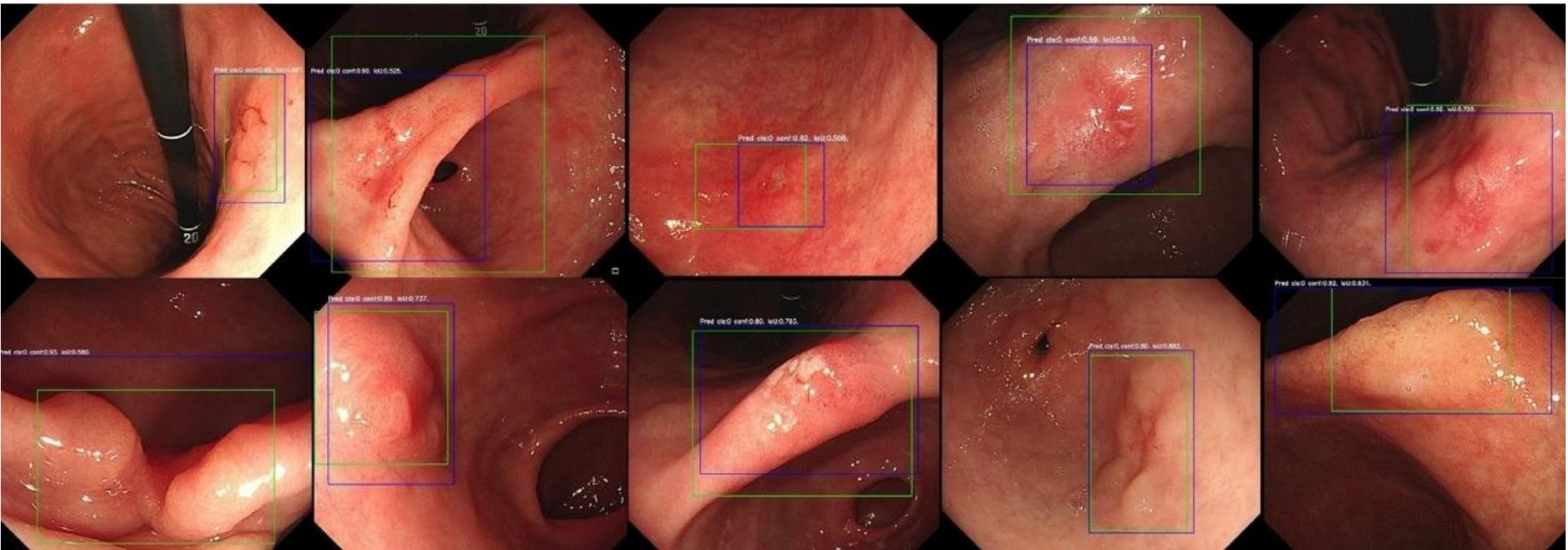


Figure: Artificial intelligence–assisted computer-aided detection (CAD) system highlighting gastrointestinal structures during endoscopic imaging.

RESULTS

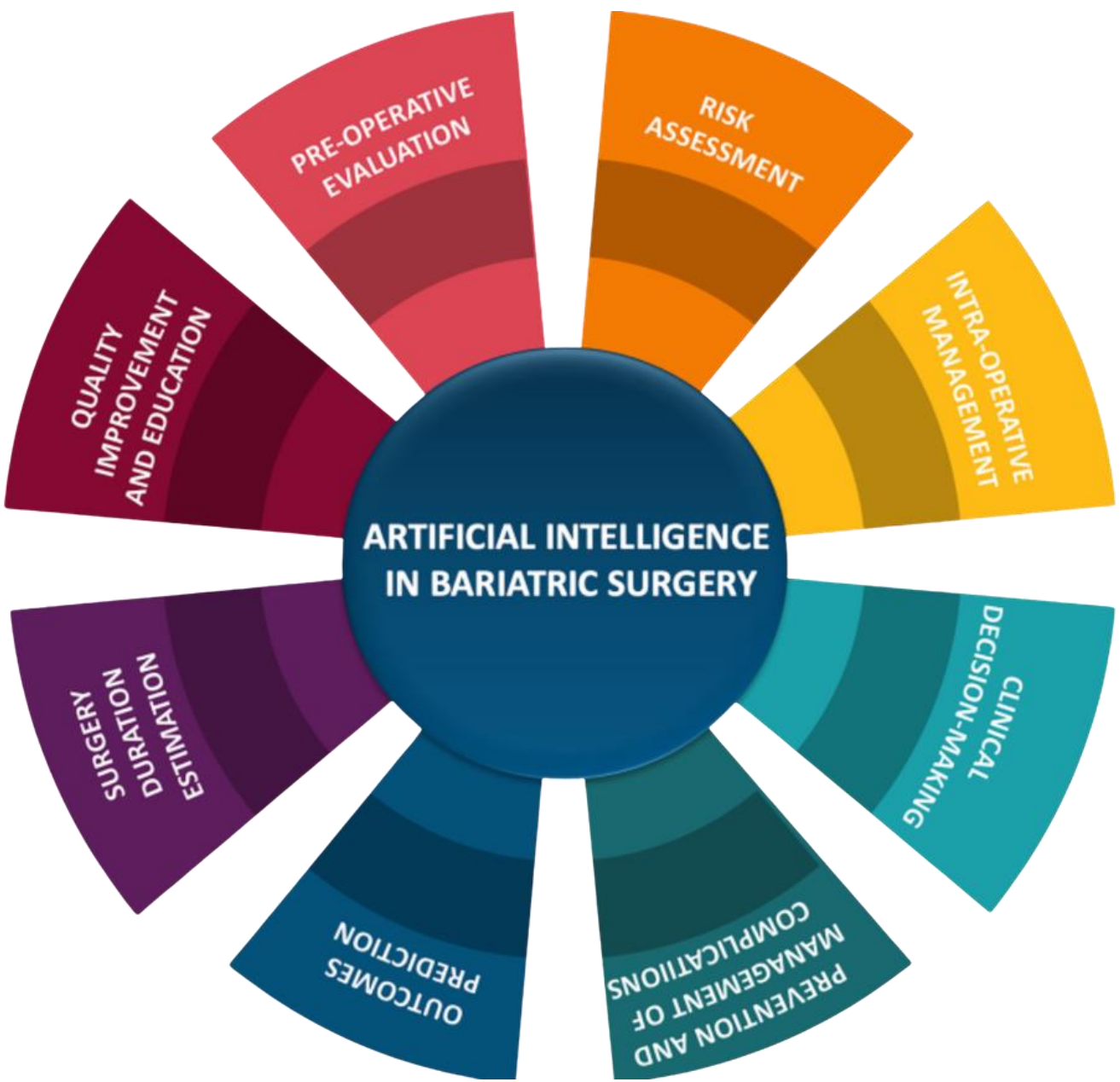
AI systems, including convolutional neural networks for image recognition and AI-guided navigation platforms, improved anatomical detection and intraoperative decision-making. Studies report 20–40% reductions in operative time and decreased complication rates. Emerging technologies such as AI-assisted augmented reality and predictive metabolic modeling enable personalized procedural planning and improved patient selection.

METHODS

Literature review of studies published between 2018–2025 using PubMed, IEEE Xplore, and Web of Science focusing on machine learning applications in bariatric endoscopy.

KEY MESSAGE

AI integration improves precision, safety, and personalization in endoscopic bariatric surgery, advancing the field toward AI-driven precision gastroenterology and improved patient outcomes.



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