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Review

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Optical Coherence Tomography in the Gastrointestinal Tract

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Abstract

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Optical coherence tomography (OCT) is a high-resolution, cross-sectional optical imaging technique that allows in situ imaging of tissue by measuring back-reflected light. OCT provides images in real time with a resolution approaching that of conventional histopathology, but without the need for tissue removal. OCT imaging can be performed

endoscopically to visualize gastrointestinal tissue using a fiberoptic catheter passed through the instrument channel of a conventional endoscope. The resolution of OCT allows visualization of the different layers of gastrointestinal epithelium and the differentiation of Barrett's epithelium from normal gastric and squamous mucosa. OCT has also been used to image esophageal adenocarcinoma and colonic polyps. Recent developments include Doppler OCT, spectroscopic OCT, and ultrahigh-resolution OCT, which can visualize nuclei within single cells. Although still in its infancy as a clinical tool, OCT currently provides high-resolution images over the same imaging depth as conventional mucosal biopsy, and may prove to be a useful and minimally invasive technique for evaluating gastrointestinal tissue, particularly for early neoplastic changes.



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