MEDCO FORUM®

PRESENTING INNOVATIVE PRODUCTS & SERVICES TO HEALTHCARE PROFESSIONALS

VOLUME 12 NUMBER 20 MAY 2005

REPRINT

CONFOCAL ENDOMICROSCOPY:

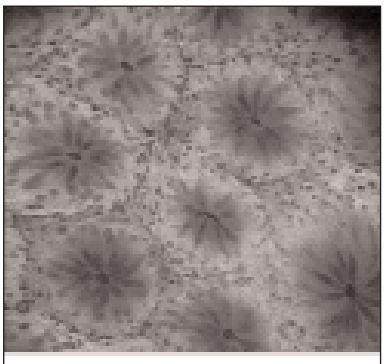
More Than Meets the Eye!

There is an exciting new technology in clinical trials in the US that will revolutionize the way endoscopists do their job. It is confocal endomicroscopy, which allows cellular and subcellular viewing of both upper and lower portions of the GI tract. Jointly developed by **Optiscan** (Australia) and **PENTAX Corporation** (Japan), this technology consists of a tiny confocal microscope integrated into the distal tip of a video endoscope. It is the goal of the clinical trials to show that endoscopists can perform functional real-time "in vivo" histology, or non-invasive optical biopsies, during traditional endoscopy procedures. The confocal endomicroscope provides images comparable to conventional biopsy utilizing up to 1,000 times magnification, a 0.7 micron limit of resolution, and viewing capabilities of surface features and sub-surface features to a depth of 250 microns. As Ralf Kiesslich, MD, Senior Physician, Department for Gastroenterology, Johannes Gutenberg-Universität, Mainz, Germany, and one of the first to use this technology in Europe states, "For many years, we have only been able to view the surface of the tissue while performing diagnostic or therapeutic procedures. Now, for the first time, we are able to see below the surface and the possibilities are endless!"

Confocal endomicroscopy is performed by placing the tip of the endomicroscope gently against the epithelium, ensuring that the confocal imaging window is in contact with the targeted area. Then the region is illuminated with soft laser light, at which point virtual optical sectioning of the tissue takes place. As the light scans the tissue, a computer creates "real-time" images containing microscopic detail. Initially, epithelial cells that comprise the lumen & its glands & pits, simple columnar & goblet cells in the colon, and stratified squamous cells in the esophagus are visualized on the monitor. As the virtual optical sectioning continues deeper into the tissue, it permits identification of histological features typi-

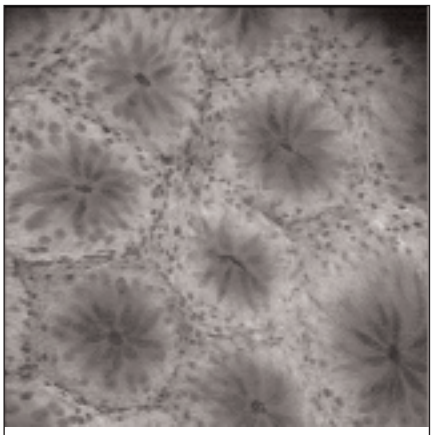
Normal Endoscopy
- ~30x
- No microscopic detail

Zoom Endoscopy
- ~100x
- Crypts visible, but no details

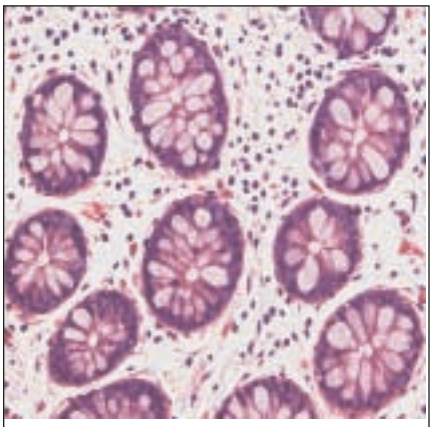


Confocal Endomicroscopy
- ~1000x
- Cellular resolution of crypts

cal of lamina propria—blood vessels and cells, basement membrane integrity, connective tissue, and inflammatory cells.



Confocal Endomicroscopy



Conventional Histology

Pre-clinical trials suggest that this emerging technology can provide significant advances in the early diagnoses and treatment of conditions such as cancer & pre-cancer of the colon, ulcerative & microscopic colitis, Barrett's esophagus, *H. pylori*, celiac disease, GERD and NERD. In addition, it is hoped that confocal endomicroscopy could lessen the need for obtaining conventional biopsy specimens in some cases. With the ability to view in vivo histology, "targeted" rather than "random" biopsies could be performed and should provide more accurate specimens when conventional biopsy is indicated. The free working channel available only with the PENTAX confocal endomicroscope will still allow therapeutic procedures to be performed as usual during the endoscopy.

When it comes to revolutionary technology, PENTAX continues to lead the way. By regularly demonstrating cutting-edge advances through the development of new techniques and technologies in the medical field, PENTAX is building a foundation that offers innovative leadership for current as well as future trends that will help endoscopists care for their patients better.

For more information on this exciting technology, please contact PENTAX at 1-800-431-5880 or online at www.pentaxmedical.com.

"Reprinted from Gastroenterology & Endoscopy News 2005; Vol 56: Number 4: Page 30."