

ENDOSCOPY

Tethered capsule endomicroscopy of the oesophagus —an easy pill to swallow

A new pill-sized tethered endomicroscope has been developed that enables 3D imaging of the oesophagus in microscopic detail, and without the need for sedation.

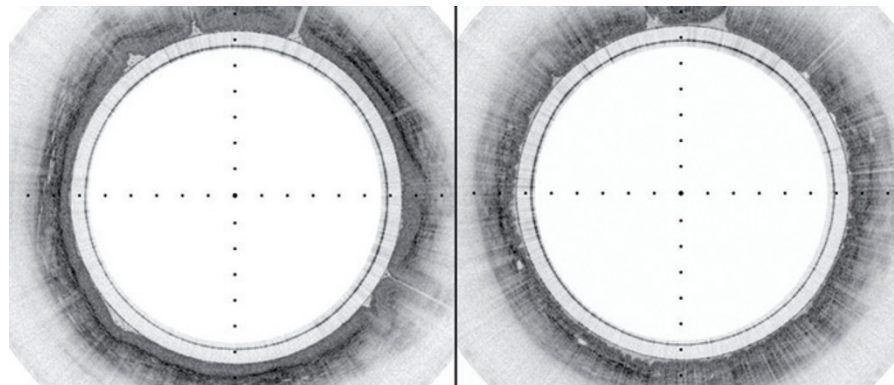
The device uses optical frequency domain imaging technology (using infrared light) to provide architectural

cross-sections of the oesophagus, which can then be reconstructed into a 3D view of the length of the oesophagus. The capsule endomicroscope is attached to a string-like tether, enabling positioning and retrieval of the device, and is pushed down the gastrointestinal tract via peristalsis.

The device was tested in 13 individuals (seven healthy volunteers and six patients with Barrett oesophagus), with distinct differences in oesophageal architecture observed between the two groups. Imaging of the oesophagus was rapid—transit time for a ~15 cm portion was only 58 s—and the entire procedure (from capsule insertion to extraction, and encompassing four imaging passes, two up and two down) lasted just over 6 min.

Author Guillermo Tearney believes the technology is “a game changer” as it “can be implemented anywhere, rapidly, and conveniently” and could enable screening for gastrointestinal disease in a primary-care setting.

Katrina Ray



Tethered capsule endomicroscopy of normal and Barrett oesophagus. Images show entire cross-sections of the oesophageal wall at microscopic resolution. Normal oesophagus (left) has a layered appearance, with a smooth oesophageal wall surface, whereas Barrett oesophagus (right) does not have this layered appearance; it instead has an irregular surface and empty spaces that indicate the presence of glands. Tick marks are separated by 1 mm for scale. Image courtesy of G. Tearney and colleagues.

Original article Gora, M. J. *et al.* Tethered capsule endomicroscopy enables less invasive imaging of gastrointestinal tract microstructure. *Nat. Med.* doi:10.1038/nm.3052