Flexible technologies for endoscopic procedures: current achievements and medical perspectives

M. Keuchel, Bethesda Hospital Bergedorf, Hamburg, Germany

Flexible endoscopy is an integral diagnostic and therapeutic tool in clinical gastroenterology. High quality standards for safety, patients comfort and efficiency have been achieved. Colonoscopy as gold-standard for colorectal cancer screening includes prophylactic removal of detected adenomas as precursors of cancer.
High resolution gastrointestinal (GI) endoscopes are commercially available. Additional features for enhanced characterisation of mucosal and vascular patterns are virtual chromoendoscopy, zoom, confocal laser microscopy, endocytoscopy, and autofluorescence. Additional cameras can enlarge the viewing field. Endoscopic ultrasound visualizes also deeper layers.
Possibility of luminal cleansing is a major advantage of flexible GI endoscopy. Applying various devices through the working channel enables staining, biopsies, injection, polypectomy, submucosal dissection, clipping, coagulation, dilation, and stenting. Large clips or band-ligators are attached to the endoscope tip.
Self-propelled colonoscopes may provide painless sedation-free endoscopy.
Ballon or spiral overtube devices assist in deep enteroscopy of the small bowel or incomplete colonoscopy. External caps, flaps, balloons or wheels may optimize endoscope position.
Procedural limitations of flexible endoscopy are rare, including incomplete investigation, patients´ discomfort, complications as perforation, and risks of sedation. However, frequent reluctance to screening colonoscopy and cumbersome flexible enteroscopy of the mid small bowel demand further research to improve alternative minimally invasive wireless technologies.

Dr. Martin Keuchel is Head of the Department of Internal Medicine at Bethesda Hospital Bergedorf, Hamburg, Germany. He obtained a BSc (Vordiplom) in Biology at JW Goethe University in Frankfurt (1980) and his Medical Doctorate from Philipps University Marburg Germany at the Institute of Experimental Immunology (1987). He was a fellow in Internal Medicine, Nephrology, Intensive Care and Transplantation at University of Marburg, in Infectiology at Bernhard Nocht Institute for Tropical Medicine, and in Gastroenterology at Asklepios Klinik Altona, Hamburg. He has a diploma in Tropical Medicine (1991) and Board certification in Internal Medicine (1993), Nephrology (1997), and Gastroenterology (2002). He received the venia legendi at Semmelweis University, Budapest, Hungary with his habilitation on optimizing video capsule endoscopy and he is a lecturer at Asklepios Campus Hamburg in Gastroenterology. He is a fellow of the European Board of Gastroenterology and Hepatology.