Any adult who has had a routine colonoscopy is intimately familiar with an endoscope—defined most simply as a slender, flexible, movable, tube-shaped instrument with a light and a camera for viewing the inside of the body or removing tissue. “All gastroenterologists are trained in standard upper endoscopy and colonoscopy,” explained James Farrell, MD, Professor of Medicine (Digestive Diseases) and Director of the Yale Center for Pancreatic Disease. But during his training, Dr. Farrell became captivated by the potential for endoscopes to do even more, not just with screening, but with early diagnosis, treatment, and even relieving pain and blockages in patients who are critically ill. “It was clear to me that if I wanted to develop a career that involved the diagnosis and management of gastrointestinal cancer, I would need an additional set of skills beyond standard endoscopy.”

While standard endoscopy is typically used to detect large polyps and tumors in the colon and issues in the upper digestive tract, at Smilow Cancer Hospital, the advanced endoscopy team primarily focuses on the bile duct and the pancreas—two areas that can be difficult to access with standard endoscopic instruments. Using techniques...
including endoscopic retrograde cholangiopancreatography (ERCP)—which combines upper-GI endoscopy and X-ray—and endoscopic ultrasonography (EUS), a combination of ultrasound and endoscopy. "We can, for instance, detect precancerous and cancerous lesions earlier, which makes a tremendous difference in terms of curative treatments," said Thiruvengadam Muniraj, MD, FRCP, Assistant Professor of Medicine (Digestive Diseases). "When we use these instruments to do a biopsy and give patients an immediate diagnosis, you feel like you're touching someone's life and changing things for them in a big way."

A BRIDGE TO NEW TREATMENTS

It can help to think of advanced endoscopy as a "bridge" between endoscopy and open surgery, explained Pratik Jamidar, MD, FACS, FASGE, Director of Endoscopy at Smilow Cancer Hospital and Professor of Medicine (Digestive Diseases). "It allows us to do a lot of things in a minimally invasive way that just a few years ago would have required open surgery." One example—removing gall-bladders that are left in a patient's bile duct after a gallbladder removal—would have had to undergo a surgical exploration of the bile duct, which generally means a week in the hospital and six weeks to undergo a surgical exploration of the bile duct, which would have required open surgery. "One example: Removing the stone, and have the patient home in a day or two, and back to work in a week, which is tremendously impactful."

Advanced endoscopic techniques can also be used to remove larger polyps in the colon that would have otherwise required a major surgical procedure. "We use a technique known as endoscopic mucosal resection to lift the polly off the lining with cold saline and cut it out," explained Muniraj.

ENDOSCOPY ON STEROIDS

"The team thanks souped up technology for these advances, including high-definition imaging, and microscopes with advanced features that allow surgeons to look at individual cells. "What that means is that we can now see very early-stage cancers in the lining of the stomach, esophagus, and colon, as well as fine needles depicted in a way we can't get to with a regular endoscope," said Dr. Muniraj.

If cancer is discovered, the team allows the patient to see a movie, and it's evolving fast. "One of the newest tools is called SpyGlass, a tiny camera used in conjunction with ERCP to go inside the bile duct and create images on a large TV screen," said Muniraj.

HANDS ON TREATMENT—AT EVERY STAGE

As important as technology is to Smilow's advanced endoscopy team, what comes first is patient care and outcomes. The team has a commitment to getting patients in quickly for their first appointments and follow-up visits, which is especially important for individuals coping with difficult-to-treat diseases like pancreatic, esophageal, and bile duct cancers, where early detection is crucial. "With pancreatic cancer, for instance, "we now have the ability to use endoscopic ultrasound to screen individuals who may be at higher risk for developing the disease, with a view toward diagnosing possible cancer earlier and managing it better," said Dr. Farrell.

If cancer is detected, the team allows the patient to look at the cell more closely, to take a biopsy with a small needle, to stage the cancer along with colleagues in Yale Pathology, and to determine if surgery is possible. Another advance: Inserting very small 3mm or 10mm gold metallic markers known as fiducials into the tissue of the cancerous organ—typically around the periphery of a tumor—to define its location. "This helps our radiation oncologists know exactly where to focus, especially for very small tumors that can be tough to see on a CT scan," explained Dr. Farrell. "The fiducials provide guidance that makes for a more focused, effective treatment that is safer for the patient."

"That precision medicine, and advanced endoscopy facilitate in it a very real way," said Dr. Farrell. "We've gone from the ability to merely diagnose to stage the cancer along with colleagues in Yale Pathology, and work with oncologists and radiologists to target treatment options based on molecular information," said Dr. Farrell. "We've grown from the ability to merely diagnose a tumor to specifying the type of treatment best suited for each patient."

EASING PAIN AND OTHER SYMPTOMS

Advanced endoscopic techniques can also be used in a palliative way, producing results that longitudinally improve quality of life for cancer patients and comfort of their families. "A person with cancer should never suffer from pain," said Dr. Jamidar emphasized. With advanced endoscopic tools, it's possible to ease symptoms that can be tough to ease on a CT scan," explained Dr. Farrell. "That's precision medicine, and advanced endoscopy facilitate in it a very real way," said Dr. Farrell. "We've gone from the ability to merely diagnose to stage the cancer along with colleagues in Yale Pathology, and work with oncologists and radiologists to target treatment options based on molecular information," said Dr. Farrell. "We've grown from the ability to merely diagnose a tumor to specifying the type of treatment best suited for each patient."

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Another minimally invasive technique, known as radiofrequency ablation (RFA), can shrink tumors by delivering radio waves directly to lesions in the bile duct through a tiny probe. "This can increase longevity for patients with bile duct cancer," explained Dr. Jamidar.

TEAM EFFORT

Easing pain and other symptoms—ERCP can also be used to place a stent in the pancreas to bypass obstruction in a minimally invasive way, to relieve jaundice, or enable a patient with blockages to begin eating again, ability that is incredibly gratifying."

Another minimally invasive technique, known as radiofrequency ablation (RFA), can shrink tumors by delivering radio waves directly to lesions in the bile duct through a tiny probe. "This can increase longevity for patients with bile duct cancer," explained Dr. Jamidar.

Advanced endoscopy team provides a unique set of services, including very precise diagnosis and helping for patients with bile duct or pancreatic cancer to RFA directed ablations," said Kevin Billingsley, MD, MBA, FACS, Professor of Surgery (Endoscopy) and Chief Medical Officer of Smilow Cancer Hospital, who works closely with the advanced endoscopy team. "The diagnostic and staging information they provide is crucial to helping us make the most accurate multidisciplinary treatment decisions."

And with technology continually being fine-tuned and upgraded, the treatments and patients treatment experiences will only get better. "The types of things we can do through a scope, more safely and effectively than with standard methods, are continually evolving," said Dr. Aslanian. "It's a very fast field, very hands-on. You are able to do a lot of problem solving because you get a visual immediatel y and can go right to the therapy," he enthuses. "That's incredibly gratifying."

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