Explore the Uncharted Territory - Enteroscopy

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Mrs. Liu is seventy-six years old. Her past medical history includes cirrhosis, congestive heart failure and chronic renal insufficiency. Moreover, she suffers from repetitive occurrence of gastrointestinal bleeding. She was diagnosed with endoscopy and colonoscopy as well as other related imaging techniques, but the cause of the disease could not be found. After a brief discussion among the doctor, patient and family members, a "single balloon enteroscopy by oral approach" was performed. The doctor spotted some potential lesions of vascular proliferation in the small intestine. After appropriate endoscopic therapy and medicine, the small intestine hemorrhage was under control. The patient was discharged soon after.

Gastrointestinal endoscopic therapy is an avant-garde invention of the twentieth century. Prior to the widespread use of gastrointestinal endoscope, gastrointestinal physicians struggled to diagnose and treat assorted gastrointestinal diseases. With the aid of gastrointestinal endoscope, doctors have breakthroughs in treating disorders of esophagus, stomach, duodenum and large intestine. However, there is still one area "inaccessible" even with the help of new technology. That is the small intestine, which is below the duodenum and above the large intestine.

The human gastrointestinal tract starts from the esophagus, which is below the throat, followed by the stomach, duodenum, small intestine and large intestine. The small intestine, located in the middle of the tract, plays a pivotal role in food digestion and assimilation of nutrients. The average length of the small intestine is 4 to 6 meters long, about three quarters length of the whole gastrointestinal tract. As the small intestine meanders within the abdominal cavity, it is difficult to diagnose with the traditional gastrointestinal

endoscope. The length of the gastric endoscope is about 100 to 120 cm. The length of the large intestine endoscope is 150 cm. The effective range of the push-type small intestine endoscope is only 50 to 150 cm. In the realms of gastrointestinal endoscopic therapy, small intestine is the "dark continent", an area not yet explored in the twentieth century.

Capsule Endoscopy – First Light into Small Intestine

As the technology advances, the field of small intestine endoscopy finally has a breakthrough in the twenty-first century. Capsule endoscopy was introduced in the year 2000. It opened the door for the diagnosis of the small intestine endoscopy. Capsule endoscopy has the advantage of being non-intrusive nature, and high diagnosis completion. Due to the limitation of its functions, capsule endoscopy can only diagnose and not biopsy sampling nor treatment. The invention of balloon endoscopy (single balloon and double balloon) for small intestine can diagnose as well as biopsy sampling and endoscopic treatment.

Common clinical symptoms that require balloon enteroscopy, including obscure gastrointestinal hemorrhage where the cause is unidentifiable even after repeated gastroscopy, colonoscopy and other auxiliary imaging, are difficult to treat. Hemorrhage as result of small intestinal lesion occupies 75% of all obscure gastrointestinal hemorrhage.

Then there are the diagnosis and treatment of small intestinal tumor or polyps, which can be dealt with biopsy, recession and other therapeutic measures. There are also cases like the removal of gastrointestinal foreign bodies, diagnosis or treatment of stenotic lesion in the small intestine,

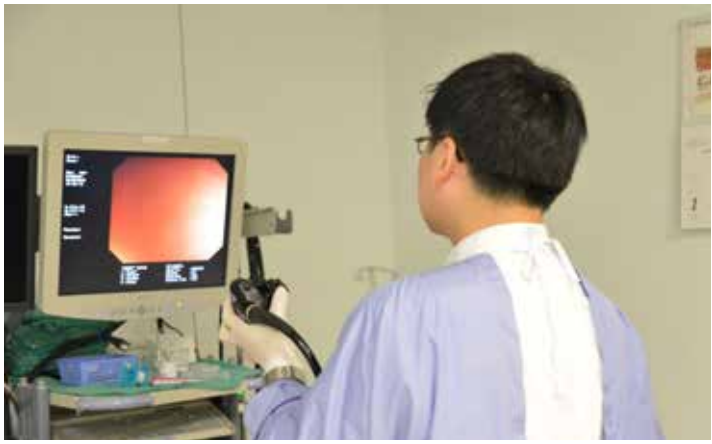

Photo depicts Dr. Hung-Ta Chen is operating the enteroscope for a patient.

long term abdominal pain of unknown cause or unconfirmed diagnosis even after repeated gastroscopy, colonoscopy or other imaging, after other tests (capsule endoscopy or abdominal CT scan) and suspect the cause to be small intestinal lesions, would require targeted examination or therapy.

Single-Balloon Endoscope - Deep into the Small Intestine

A single-balloon endoscopy is a procedure where endoscope is introduced deep into the small intestine, with the assist of single-balloon overtube, to fulfill diagnostic and therapeutic purposes. A single-balloon endoscopy looks similar to a gastrointestinal endoscopy, but has a length of 200 cm, assisted with an overtube 140cm long with a inflatable balloon at the tip, which is then used to hold the intestinal wall and retract, pulling and folding the small intestine repeatedly to reach its depth. Since the length of the small intestine is about 4 to 6 meters, it will require oral as well as anal intestinal endoscope to complete a full inspection of its entirety. Preoperative preparation for oral intestinal endoscope is similar to a gastroscope. It calls for the fasting of 8 to 10 hours whereas anal intestinal endoscope requires laxatives, diets control and fasting. Balloon endoscope is more time consuming compared with regular endoscope, as it demands a higher level of technical skills to operate. The current health insurance does not cover the cost of the material such as balloon overtube.

Because the examination goes deep into the small intestine, patients are likely to feel more uncomfortable or even painful compared with gastroscopy and colonoscopy. It often calls for anesthesiologists to administer proper anesthesia for a smooth examination. There is about 1 to 2 percent chance of possible complications for using balloon endoscope., which includes gastrointestinal perforation, bleeding, infection and pancreatitis. In case of complications, patients are instructed to fast, and drip infusion and antibiotics injection if necessary, and be placed under close observation. Surgery is required in the case of severe complications, such as uncontrollable gastrointestinal perforation.

As the technology advances, there are more options now for the examinations of the small intestine, such as capsule endoscopy and the balloon-typed endoscopy which allow for immediate and proper treatment for the small intestine related diseases. After the spiral intestinal endoscopy was invented and utilized, medical science in small intestine diseases will elevate to a higher level and grant patients with better treatment.