

The Art of Minimalism - Endoscopic Submucosal Dissection

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Mr. Wang, 82 years old, was considered relatively healthy aside from hypertension. Two years ago he visited gastroenterology of Taipei Tzu Chi Hospital due to discomfort in the upper abdomen, and gastroscopy revealed it to be ulcer. During these two years he received three more gastroscopy, with a biopsy each time, and each pathology report indicated gastritis and benign ulcer. Recently Wang visited the hospital again due to upper abdominal discomfort. His doctor recommended another gastroscopy as a precaution to identify any relapsing ulcers and signs of gastric cancer, as there is a 5% chance that ulcers could be malignant.

During upper gastrointestinal endoscopy, an approximately 1.5 cm

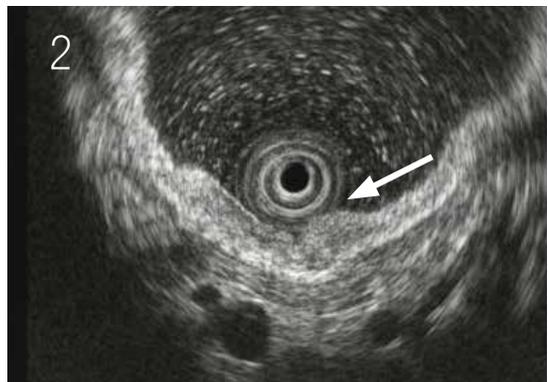
mucosal lesion with mild depression and wrinkled convergence located near a bend in the gastric antrum was identified (Pic 1, see arrow), and the biopsy confirmed it to be gastric cancer. Endoscopic ultrasound confirms that the cancer cells, still in its early stage, only spread to the mucous membrane (Pic 2, see arrow). CT scan confirms no sign of regional lymph node or distant organ metastasis. The doctor performed endoscopic submucosal dissection, or ESD(Pic 3). Wang recovered few days after the surgery and was discharged. The follow-up endoscopy a year later revealed the scar tissue (Pic 4, see arrow), and the biopsy showed no sign of cancer relapse.

High Cure Rate against Early Cancer

In 1995, two Japanese scholars, Hosokawa and Yoshida, developed insulation tipped-knife (IT knife) by adding an insulated tip to needle knife used in endoscopic Duodenal sphincterotomy. Dr. Gotoda and Dr. Ono utilized the IT-knife and invented a new mucosal resection where any tumor, despite its sizes, can be completely resected. The technique is tremendously beneficial to either the complete ablation of tumor or the interpretation of postoperative

pathological findings. This new surgical procedure is named “endoscopic submucosal dissection”. It is the most popular therapeutic choice in terms of early esophageal, gastric and colorectal cancer. The main purpose of this surgery is to utilize the minimally invasive endoscopic surgery to replaces some traditional radical surgeries and still achieve the goal of tumor eradication.

When treating gastrointestinal malignant lesion that only spread to mucous membrane and showed no sign of lymph node or distant organ metastasis, endoscopic submucosal dissection allows surgeons to perform



regional resection with vision, instead of the traditional laparotomy. Since Dr. Tada reported the first successful case of performing early gastric cancer resection with endoscope in 1983, over the next two decades, with the advancement of endoscope and operating techniques, it has become a standard treatment for early esophageal, gastric and colon cancer. The long term survival rate of the treatment not only matches those of the traditional surgery, but can also avoid its risks and postoperative sequelae.

Endoscopic submucosal dissection is a new technique which could completely resect the lesion, developed to compensate for the inabilities of traditional endoscopic mucosal resection where complete resection of larger lesions are not possible. Endoscopic submucosal dissection also provides a detail pathological judgment on the degree of lesion and its invasiveness,

which contributes to the avoidance of traditional surgeries.

Patients with early gastrointestinal cancers (including esophagus, stomach, duodenum and colon), proven by endoscopic ultrasound that it has not spread beyond the mucous membrane, and images showed no signs of regional lymph node metastasis, are the perfect candidates. Furthermore, the resection of dysplasia (ie, precancerous lesions), like the resection of dysplasia in Barrett's esophagus, a disease that may easily lead to precancerous lesion, is one of the applicable diseases.

The treatment is not applicable to all early gastric cancers, though. Conditions such as poorly differentiated cancer, cancer cells reaching submucous layer (approaching muscle layer), inappropriate anatomical location or clotting problems are not recommended for such treatment, as the chance of relapse and complications are high.

It is recommended that the patient be anesthetized, general or intravenous, due to the long surgical duration. The resection primarily utilizes needle knife or IT-knife to make a circular incision around the lesion, separating the lesion from the surrounding normal tissues, and gradually dissect the lesion with its



Dr. Chien-Hua Chen, the director of the medical examination room, is explaining to the patient examination details and procedures.

lower tissues with IT-knife. Endoscopic submucosal dissection has two major complications: hemorrhage and perforation. The surgeons must pay attention to hemorrhaging during the procedure and use hemostatic clip or cautery to stop the bleeding. When performing submucosal dissection, make sure the dissection is not too deep to avoid perforation. If the perforation is small, seal it with a metal clip. If black or bloody stools are present, use endoscope to stop the bleeding. Perforation must be dealt according to its location. If the perforation is in the esophagus, for example, beware of fever or enhanced chest pain, and begin surgical repair if so. If the perforation is in the stomach, insert nasogastric tube to decompress, remain fasting, administer antacid and decide the course of action depending on the patient's condition. If the patient's stomach continues to ache and exhibited signs of peritonitis, resort to surgery. As for large intestine, if the abdominal pain persist, resort to surgery as well.

In comparison with traditional endoscopic mucosal resection, endoscopic submucosal dissection leaves less cancer residue and has a lower rate of relapse. In the case



Dr. Chien-Hua Chen uses endoscope to examine the patient thoroughly for any signs of lesion.

of residue or relapse, depending on the conditions, another dissection or traditional surgery may be performed. For inoperable patient, laser or argon plasma coagulation can be used as adjuvant therapy, cauterize the ulcers from the dissection to completely ablate the cancer.

Endoscopic submucosal dissection offers a complete resection of early gastrointestinal cancer. Compare to traditional surgery, patients recover faster and without the issue of wound management. Furthermore, no organs are sacrificed, as all organs and their original biological functions remain intact. In an era of minimal invasive surgery and with NHI on a tight budget, ESD is regarded as an excellent candidate for early cancer treatment. The relapse rate for ESD beginner is on the high end, though, and requires experience to offer a better, safer treatment.