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Clinical Use of Liu-POEM and NOTES**Bingrong Liu**

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Introduction: With the commencement of clinical use, endoscopy now covers a wide range of usage for clinical examination and minimally invasive surgery. It is a great trend and reality for such techniques to go further into a state of routine approaches in clinical practice. Now, I am willing to introduce the excellence of initiation and development of gastrointestinal endoscopy in three selected facets partly supported by our new development and techniques in our clinical practices and studies.

Liu-POEM: Peroral endoscopic myotomy (POEM): POEM was developed to provide a minimally invasive treatment for esophageal achalasia. From this technique, we developed a modified POEM approach and named as Liu-POEM, which is no need for creating a tunnel and hence shortens operation time and alleviates patient's pains remarkably. Now, Liu-POEM has been used by more and more endoscopists in the world. (1) Background. Esophageal achalasia is a primary motility disorder involving absence of esophageal peristalsis, failure of the lower esophageal sphincter (LES) to relax, and cardiac diastolic dysfunction. Peroral endoscopic myotomy (POEM) has emerged as an approach to treating esophageal achalasia. Although POEM is credited with high success rates in the treatment of achalasia, the submucosal tunneling is time consuming and commonly requires one-third to two-thirds of the total operation time. For the purpose of improving POEM procedure and shortening operation time, we modified the POEM procedure by combining the procedures of myotomy and tunnelization into an unit step. We named this approach as modified peroral endoscopic myotomy, the Liu-POEM. (2) Operational procedures. 1). Creation of a 1cm submucosal tunnel at the right or back esophageal wall approximately 8 cm proximal to the esophagogastric junction (EGJ).

Pure NOTES: (1) Introduction. Since Natural Orifice Transluminal Endoscopic Surgery (NOTES) was first described by Anthony Kalloo, it has attracted tremendous interest from surgeons and gastroenterologists all around the world. Natural orifice transluminal endoscopic surgery (NOTES) uses transvisceral access to the peritoneal cavity through mouth, rectal, colon, and vagina ect.. Now, a number of endoscopic approaches can be performed by NOTES and Pure NOTES. We have performed A series of operations by Pure NOTES, and the most successful one was transrectal gallbladder preserving cholecystolithotomy (TRGPC) and transrectal gallbladder preserving polypectomy (TRGPP) by pure NOTES, which was the first such case series in human beings. (2). Operational procedures. The key steps for TRGPC and TRGPP are as below. Ultrasonic examination was required for disease confirmation and assessment prior to operation. Under general anesthesia after routine preparations, the patient was placed in a left recumbent position prior to the initiation of the procedure. A colonoscope was introduced into the transverse colon and the colonic lumen was cleaned with normal saline through the endoscope and then the endoscope was withdrawn from the colon. A detachable prototype balloon which was developed by our team was placed into the transverse colon by a biopsy forceps and was inflated to block the colonic lumen with a suitable pressure inside the balloon (Fig. 1-A). The distal colon cavity was irrigated with normal saline solution and disinfected with a 0.1% povidone-iodine solution. A disinfected endoscope with a transparent cap mounted at the tip of it was used. To ensure a smooth advance of the endoscope and the accuracy in spatial identification in the peritoneal cavity, the Trendelenburg's position is suggested. After submucosal saline injections, a 2 cm incision was made on the anterior rectal wall 15-20 cm from the anus by hook and IT knives. The endoscope was advanced into the pelvic cavity, and an incision was made on the peritoneum by a hook knife to enable the flexible endoscope pass through into the peritoneal cavity, and then the endoscope was advanced upward into the upper peritoneal cavity with liver and gallbladder identified.

Conclusion: In conclusion, minimally invasive surgery is now playing an important role in the fields of surgery and gastroenterology. We believe, along with the innovations in new instruments and techniques, as well as our ceaseless explorations of new things, more and more new approaches and procedures of gastroenterological endoscopy will come up and be widely used in various clinical practices.

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