

Human NOTES Cholecystectomy: Transgastric Hybrid Technique

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Abstract

Background Natural orifice transluminal endoscopic surgery (NOTES) is an emerging field in minimally invasive surgery that is driving the development of new technology and techniques. There are several proposed benefits to the NOTES approach, including potentially decreased abdominal pain, wound infections, and hernia formation Ko and Kalloo (Chin J Dig Dis 7:67–70, 2006); Wagh et al. (Clin Gastroenterol Hepatol 3(9):892–896, 2005); ASGE/SAGES Working Group on Natural Orifice Transluminal Endoscopic Surgery (Gastrointest Endosc 63(2):199–203, 2006); and Pearl and Ponsky (J GI Surg 12:1293–1300, 2008). Cholecystectomy has been one of the most commonly performed NOTES procedures to date, with the majority being performed through the transvaginal approach Marescaux et al. (Arch Surg 142:823–826, 2007); Zorron et al. (Surg Endosc 22:542–547, 2008); and Ramos et al. (Endoscopy 40:572–575, 2008). Transgastric approaches for cholecystectomy have been shown to be technically feasible in animal models and in several unpublished human patients Sumiyama et al. (Gastrointest Endosc 65 (7):1028–1034, 2007). This video demonstrates the technique by which we perform transgastric NOTES hybrid cholecystectomy in human patients.

Method Patients with symptomatic gallstone disease are enrolled under an IRB approved protocol. A diagnostic EGD is performed to confirm normal anatomy. Peritoneal access is gained using a needle-knife cautery and balloon dilation under laparoscopic visualization. Dissection of the critical view of safety is performed endoscopically. The cystic duct and artery are clipped laparoscopically and the gallbladder is dissected off of the liver. The gastrotomy is closed intraluminally and over-sewed laparoscopically. The gallbladder is extracted out the mouth.

Results This technique was used to successfully perform four NOTES hybrid transgastric cholecystectomies without operative complications.

Conclusions NOTES hybrid transgastric cholecystectomy can be performed safely in human patients. This procedure is still technically challenging given the current instrumentation that is available. In order to perform a pure NOTES transgastric cholecystectomy, a safe blind access method, improved retraction, endoscopic hemostatic clips, and reliable closure methods need to be developed.

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