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## **Experience with a training program for transgastric procedures in NOTES.**

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### **Abstract**

**INTRODUCTION:** The transgastric approach to the abdominal cavity has been under experimental investigation in recent years as a method of natural orifice transluminal endoscopic surgery (NOTES). In this study our team, consisting of surgeons and gastroenterologists, focused on training techniques with currently available instruments to perform transgastric procedures. The purpose of this paper is to evaluate the learning process during the establishment of a training program for NOTES. Therefore several procedures were tested in terms of training issues such as the applicability of instruments and techniques for both gastroenterologists and surgeons. **METHODS:** After initial testing of the basic steps, a defined training program was initialized in an animal facility of a medical company. Permission for animal training was applied for and granted by the local government. Ten training sessions were performed on a porcine model using animals with a median weight of 65 kg (40-85 kg). General anesthesia was performed in all cases. Transgastric tube resection (TTR), cholecystectomy (TCE), cardiomyotomy (TMY), and small bowel segmental resection (TSBR) were performed. The learning process was evaluated, including handling issues for flexible instruments, access, closure problems, and special technical issues. Procedure duration, as a marker of the learning curve effect, was evaluated. **RESULTS:** Intra-esophageal friction, lack of platform stability, lack of precision in tissue retraction, and lack of independence of endoscopic vision were the most difficult technical problems encountered. The operative time range was 25-85 min for TTR, 75-185 min for TCE, 95-220 min for TMY, and 100-260 min for TSBR. **CONCLUSIONS:** A learning curve was demonstrated for each investigated technique.

These results are promising in terms of the ability of surgeons and gastroenterologists to develop these procedures into a clinical applicable version. Technical limitations were more important than differences in medical education, providing that there is a certain level of experience in both flexible endoscopy and laparoscopy, as well as a team approach.

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*JLS. 2008 Jan-Mar; 12(1):37-45.*  
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- [Experimental trial of transvaginal cholecystectomy: an ex vivo analysis of the learning process for a novel single-port technique.](#)  
*Surg Endosc. 2009 Oct; 23(10):2242-9. Epub 2009 Jan 1.*  
[Surg Endosc. 2009]
- [NOTES: cadaveric rendezvous hybrid small bowel resection.](#)  
*Surg Endosc. 2008 Oct; 22(10):2277-8. Epub 2008 Jul 23.*  
[Surg Endosc. 2008]
- [ReviewNOTES: a review of the technical problems encountered and their solutions.](#)  
*J Laparoendosc Adv Surg Tech A. 2008 Aug; 18(4):583-7.*  
[J Laparoendosc Adv Surg Tech A. 2008]
- [ReviewNatural orifice transluminal endoscopic surgery 2009: what is the future for the gastroenterologist?](#)  
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