Deep Ileoscopy and Upper Enteroscopy: Initial Experience with a Novel Balloon Technique Employing Standard Endoscopes

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INTRODUCTION

DBE[1] and SBE[2] are well established balloon techniques for deep small bowel investigation. Each employs dedicated endoscopes and pre-mounted disposable elements (balloon and overtube) to enable deep enteroscopy by a "push and pull" technique. A new FDA cleared single-balloon device (NaviAid™ AB; SMART Medical Systems Ltd., Ra'anana, Israel) was recently introduced, facilitating fast anterograde jejunoscopy and retrograde ileoscopy with standard endoscopes. Several retrograde procedures were performed with the device at FCCC providing successful ileal examination using a standard colonoscope.

DEVICE DESCRIPTION

The device consists of a balloon inflation/deflation system and a single-use balloon catheter, designed for anchoring in the small bowel. The catheter is inserted upon need during the procedure through the instrument channel of a standard endoscope and advanced ahead of the endoscope. Then the balloon is inflated to anchor in the intestine and a push-pull step is performed, with the endoscope sliding over the guiding catheter. Sequential steps may be performed as needed. The catheter being a through-the-channel device, no pre-procedure mounting is required.

Figure 1: Device inflated ahead of the Endoscope

Figure 2: Anchored balloon during push-pull step

Following advancement, steps may be carried in a reverse order to provide controlled and continuous withdrawal of the endoscope while inspecting the bowel.

Over 150 ileoscopy and upper enteroscopy procedures were performed globally to date using the device. Reported retrograde cases averaged an ileal advancement depth of 67cm past the IC Valve (range: 25 - 180cm) with corresponding average ileoscopy time of 8.5min (range: 4 - 20min). Reported anterograde cases averaged a jejunal advancement depth of 108cm past the LOT (range: 50 - 180cm) with corresponding average enteroscopy time of 15min (range: 5 - 30min).

Reported cases were performed using a variety of standard endoscopes: Fujinon Colonoscope, Pediatric Colonoscope and Therapeutic Gastroscope; Olympus Colonoscope; Pentax Colonoscope and Pediatric Colonoscope. To date, no adverse event was reported related to the use of the device.

METHODS

Following initial training that included performance of one ileal case with the device, 4 ileoscopy cases were performed with the device, by one physician. An EC-450LS5 Fujinon Pediatric Colonoscope was used in all 4 cases. Monitored anesthesia administered by an anesthesiologist was used as our standard practice.

RESULTS

Average ileal advancement depth past the IC Valve was approximately 65cm (range: 60 – 70cm), with corresponding advancement time of several minutes. Typically 3-5 sequential push-pull steps were performed to facilitate the needed advancement. Once no further advancement was clinically required, the endoscope was withdrawn while gently pushing the anchored catheter through the instrument channel of the colonoscope, providing selectable un-pleating of the bowel with extended lumen visualization. Minimal patient post-procedure bloating and abdominal pain was exhibited.

CONCLUSIONS

The new balloon technique is a safe and efficient way to perform small bowel investigation. In contrast to DBE, which following a learning curve[3] may provide total enteroscopy, this technique provides a handy tool for investigating the distal portion of the ileum in retrograde fashion or antegrade advancement to the mid-jejunum in a fast and cost-effective manner, without extensive prior experience, utilizing standard endoscopes. The through-the-channel usage of the device eliminates pre-procedure preparations and allows the decision of utilizing the device during the procedure, upon need. The procedure is well tolerated with conscious sedation. The ease of use, ability to use it interchangeably with all brands of endoscopes, coupled with the flexibility to decide upon usage during the procedure makes this a very useful tool for endoscopists.

References:

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[3] Mehdizadeh S, Ross A, Gerson L, et al. What is the learning curve associated with double-balloon enteroscopy? Technical details and early experience in 6 U.S. tertiary care centers. Gastrointestinal Endoscopy 2006;64:740-750.