

Case Report: Utilizing the NaviAid™ AB Balloon Catheter for Deep Ileoscopy and Controlled Withdrawal

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PATIENT HISTORY

39 year old male with hypertension and hemochromatosis, developed night sweats and right quadrant abdominal pain. CT of abdomen and pelvis (A/P) showed 2.7x1.9x1.5cm lymph node in the right lower quadrant. CT-guided FNA of lymph node showed well-differentiated neuroendocrine tumor. Laboratory testing showed Serum Chromogranin A level of 1.0ng/ml (reference range 1.9-15); serum gastrin of 26pg/ml (reference 13-115); serum neuron specific enolase of 26ng/ml (reference <10); and 5-Hydroxyindolacetic acid 24 hour urine of 11.8mg/24hr (reference <6). Both colonoscopy (Olympus variable stiffness video colonoscope) and ileoscopy were performed to rule out primary neuroendocrine tumor in the colon or ileum, without finding. The patient was referred to our hospital.

THE NAVIAID™ AB DEVICE

The NaviAid™ AB device (SMART Medical Systems Ltd., Ra'anana, Israel) is an FDA cleared, on-demand balloon catheter that is inserted through the instrument channel of the endoscope and enables its advancement deep into the small bowel in either antegrade or retrograde approach. The balloon catheter is advanced ahead of the endoscope and the balloon is inflated to anchor the bowel. Then, a push-pull step is performed in which the endoscope is advanced and slid over the anchored catheter.



Figure 1: NaviAid™ AB balloon catheter inflated ahead of the endoscope.

Sequential advancement steps may be performed as needed to facilitate deep small bowel inspection. Thereafter, during withdrawal of the endoscope, reverse push-pull steps may be performed by gently pushing the catheter forward with the balloon inflated and anchored, thus un-pleating bowel from the endoscope. This controlled withdrawal of the endoscope provides careful and continuous inspection of the bowel while opening intestinal folds and straightening the intestinal lumen. Therapy may be performed at any time during the procedure by replacing the balloon catheter with a standard endoscopy tool. The balloon catheter may be re-inserted following therapy to facilitate further advancement or controlled withdrawal.

PROCEDURE DESCRIPTION

Since the patient was being considered for surgery, colonoscopy and ileoscopy were requested for pre-operation evaluation. During the procedure, the NaviAid™ AB device was used. Colonoscopy (Olympus variable stiffness colonoscope) was performed and the ileum was intubated. The patient's preparation was excellent. The NaviAid™ AB catheter was inserted through the instrument channel of the colonoscope, telescoped forwardly

of the colonoscope, and then through a series of push-pull steps, the colonoscope was advanced 100cm up into the ileum in 7 minutes. Once further advancement was not required anymore, the NaviAid™ AB balloon catheter was inflated ahead of the colonoscope and controlled withdrawal was performed by gently pushing the inflated balloon catheter and slowly retracting the colonoscope. The controlled withdrawal was performed in order to ensure a comprehensive inspection of the bowel while stretching intestinal folds and slowly retracting the colonoscope. Overall, the ileal mucosa was normal. However, at approximately 20cm above the ileocecal valve, a well-circumscribed approximately 1.5-2cm diameter mass was seen with irregular mucosa without bleeding or ulceration. The appearance was consistent with carcinoid tumor. India ink tattoo was performed at the mass and distal to it. The mass was then biopsied several times for histological evaluation. Biopsy results confirmed the initial suspected diagnosis of primary carcinoid tumor of the distal ileum. The patient underwent surgery for tumor removal. During the surgery, the tattoo marking was used to identify the location of the tumor and the precise area of the ileum was removed.

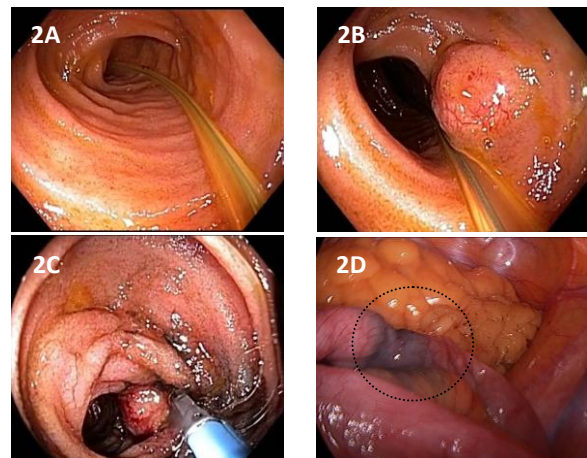


Figure 2: (A) The NaviAid™ AB balloon catheter positioned ahead of the Colonoscope during controlled withdrawal (B) 1.5-2cm diameter mass revealed during controlled withdrawal, at approximately 20cm above the ileocecal valve (C) The mass being tattooed (D) Tattoo being used during surgery to identify the location of the ileal carcinoid mass and facilitate removal thereof.

CONCLUSIONS

The described ileoscopy method using the NaviAid™ AB device enabled deep and quick access into the ileum, and performance of controlled withdrawal. Reverse push-pull steps during controlled withdrawal, while straightening intestinal folds, revealed a large carcinoid mass which was not detected during ileum intubation. The controlled withdrawal technique was essential for establishing a diagnosis, and enabled detection of a meaningful-size tumor, not detected in previous endoscopy sessions.