Double Balloon Endoluminal Interventional Platform assisted EUS-Guided Fine-Needle Aspiration of a Subepithelial Colonic Lesion: A Novel Hybrid Approach to the Diagnostic Evaluation of a Cystic Colonic Mass

AUTHORS:
Muhammad Umair Tayyub, Ciaran Judge, Amyn Haji, David Reffitt

INSTITUTIONS (ALL):
Kings' College Hospital, Kings' College Hospital NHS Foundation Trust, London, United Kingdom

Abstract

Subepithelial lesions of the colon pose a diagnostic challenge, particularly when located deep in the colon and inaccessible by conventional endoscopic or endoscopic ultrasound (EUS) techniques. We report the first case of EUS-guided fine-needle aspiration (FNA) of a descending colonic subepithelial lesion facilitated by the double balloon endoluminal interventional platform (DEIP). A 46-year-old male was referred via the two-week wait (2WW) colorectal cancer pathway for rectal bleeding. Colonoscopy and axial imaging identified a 3 cm cystic lesion at the splenic flexure, with differential diagnosis of mucinous neoplasm, colitis cystica profunda, lymphangioma and GIST. However, due to ongoing suspicion of malignancy, tissue diagnosis was required. When standard EUS scope advancement proved technically unfeasible, a hybrid technique was employed. The DEIP (DiLumen™) device served as a conduit for EUS access, allowing successful FNA of the lesion. Cytology revealed benign findings, and the patient was discharged from further oncologic evaluation. This case demonstrates the utilization of the DEIP (DiLumen™) platform in enabling minimally invasive diagnostic intervention for deep colonic lesions that are otherwise inaccessible by standard EUS.

Introduction

Subepithelial colonic lesions, particularly those located proximal to the sigmoid colon, are diagnostically elusive due to limitations in both visualization and access using conventional endoscopic ultrasound (EUS) technique. Although cross-sectional imaging and endoscopic evaluation may provide preliminary information, definitive diagnosis often requires tissue acquisition. EUS-guided fine-needle aspiration (FNA) is the gold standard for evaluating gastrointestinal subepithelial masses; however, tortuous colonic anatomy frequently precludes deep scope advancement. The availability of the Double Balloon Endoluminal Interventional Platform (DEIP) is a novel technique which allows safe and stable access to difficult lesions in the colon.(1)The DEIP (DiLumen™) is a single-use, double-balloon accessory device designed to stabilize and straighten the colon, primarily to facilitate endoluminal therapeutic interventions. In this case, we report the novel use of DEIP (DiLumen™) as a conduit for EUS scope insertion to access a lesion in the descending colon, enabling successful aspiration and diagnosis.

Case Presentation

A 46-year-old male with a history of ischemic heart disease (status post left anterior descending artery stenting), hypertension, and type 2 diabetes mellitus was referred through the 2WW lower gastrointestinal pathway with complaints of rectal bleeding and suspicion of anal mass. He underwent a colonoscopy and axial imaging as part of initial work up. Colonoscopy revealed internal haemorrhoids and, incidental finding of a 3 cm subepithelial lesion at the splenic flexure. Biopsies were not obtained due to the lesion's submucosal nature. The axial imaging of abdomen and pelvis a well-demarcated cystic lesion within the descending colon wall. Differential diagnoses of this lesion included lymphangioma, colitis cystica profunda, gastrointestinal stromal tumour (GIST), and mucinous neoplasm. He went onto have MRI which further characterized the lesion as fluid-filled, without enhancement or nodularity, supporting the possibility of a lymphangioma. He was subsequently discussed at the colorectal cancer multidisciplinary Team (MDT) and the outcome was to do surveillance with a close interval computed tomography (CT) which showed the lesion remained radiologically stable and morphologically benign. However, due to persistent suspicion of malignancy, tissue confirmation was deemed necessary prior to discharge from surveillance. EUS-guided FNA was recommended.

Method

Double Balloon Endoluminal Interventional Platform (DiLumen™, Lumendi , LLC),103 length device was mounted over a standard adult colonoscope and introduced into the colon. The scope was advanced to the cecum. Both the DiLumen™ device and the colonoscope were then withdrawn to the splenic flexure, distal to the identified lesion.At this point, the DiLumen™ aft balloon (AB) was inflated to stabilize the position and the device was left in situ, while the colonoscope was carefully withdrawn. Subsequently, a linear EUS scope was inserted through the DiLumen™ conduit and advanced smoothly to the lesion site in under two minutes. EUS examination revealed a well-defined, fluid-filled lesion measuring 27 × 14 mm, originating from the serosal layer, with a single internal septation and a possible 2 mm mural nodule.Using a 22G SharkCore™ FNA needle, 3 mL of straw-colored fluid was aspirated and submitted for cytological analysis.A single dose of intravenous co-amoxiclav was administered intra-procedurally.No immediate or delayed complications were reported.The lesion appeared cystic and benign on EUS possibly a lymphangioma or enteric duplication cyst.Cytology revealed presence of lymphocytes, plasma cells, and macrophages; no malignant cells identified.The rediscussion at MDT confirmed the cystic lesion of benign aetiology after reviewing the imaging , EUS findings and cytology results. The patient was formally discharged from the cancer surveillance pathway, with no further follow-up required.

Discussion

EUS-guided tissue acquisition is the cornerstone of minimally invasive diagnosis for subepithelial gastrointestinal lesions. However, the tortuous and mobile nature of the colon—especially beyond the sigmoid—renders advancement of radial or linear echoendoscopes technically difficult. Alternative approaches such as laparoscopic-assisted EUS or percutaneous aspiration carry increased morbidity.

The DEIP (DiLumen™), primarily designed to aid in endoscopic submucosal dissection and complex polypectomy,(2) was innovatively repurposed in this case to serve as a stable conduit for EUS access. The double-balloon configuration provided excellent luminal stability, reduced loop formation, and preserved access long enough to permit effective real-time EUS imaging and targeted aspiration.Our case illustrated this technique to be both safe and effective however caution should be taken while manoeuvring the EUS scopes and fine needle aspiration and /or biopsy needles while taking specimens as there are risks of infection and perforation.(3)This case highlights the potential role in overcoming anatomical barriers to deep colonic access.

Conclusion

This report introduces a novel application of the DEIP (DiLumen™) platform as a stabilizing conduit for EUS-guided fine-needle aspiration in the descending colon and thus facilitating a successful, minimally invasive diagnosis of a benign subepithelial lesion and preventing unnecessary surgical exploration. This hybrid approach may represent a valuable diagnostic alternative in selected cases where EUS access is limited. Further studies are needed to establish it's safety and efficacy and its routine role in evaluating the submucosal lesions in the whole colon where access and stability is a challenge.

References

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253 Post Road West, Westport, CT 06880 USA
Tel: (203) 463-2669 Fax: (203) 557-0459
service@lumendi.com | Lumendi.com