



CASE STUDY: VLE for Identification of Subsquamous Disease

PATIENT HISTORY

This patient was a 68 year old man referred with short segment Barrett's Esophagus (BE) with intramucosal carcinoma (IMC). At the referring center, previous resection of nodularity revealed T1a adenocarcinoma with negative margins. Subsequent surveillance biopsies yielded IMC, and triggered referral.

For the procedures described here, standard endoscopy with the addition of Volumetric Laser Endomicroscopy (VLE), using the NvisionVLE® Imaging System with Real-time Targeting™, was performed to localize abnormalities and inform treatment.

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PROCEDURE

INITIAL ENDOSCOPIC EXAM

The esophagogastroduodenoscopy (EGD) showed short segment BE. White light endoscopy (WLE), narrow band imaging (NBI), and the NvisionVLE Imaging System revealed no suspicious regions in the BE segment. Tissue samples from the BE segment returned negative for dysplasia or cancer.

In preparation for a subsequent surveillance endoscopy, the previous VLE data was reviewed, and subsquamous regions of suspicion were identified approximately 1 cm proximal to the BE segment (Figure 1).

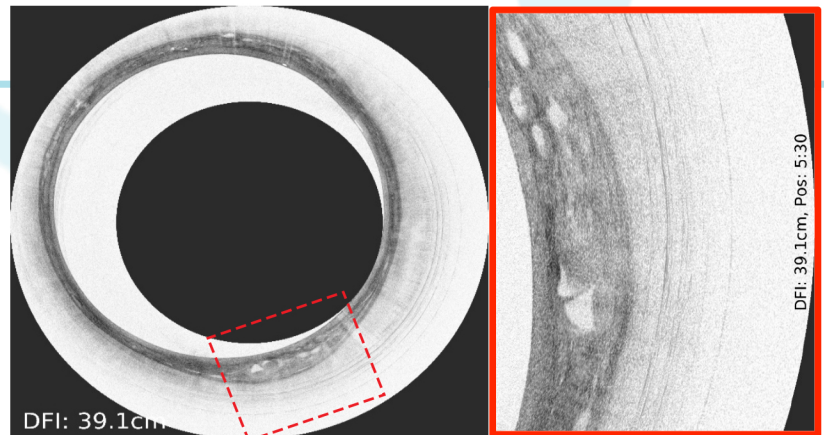


Figure 1: VLE scan data proximal to the BE segment. Transverse scan (left) shows a subsquamous area of concern (highlighted, right).

FOLLOW UP ENDOSCOPIC EXAM

The follow up EGD showed short segment BE. WLE and NBI revealed no regions suspicious of dysplasia or cancer in or proximal to the BE segment. Using the information from the initial VLE exam, a very slight discoloration of the mucosa, not suspicious for dysplasia or cancer, was identified 1 cm proximal to the BE segment using NBI, and a cautery mark was placed on both sides as landmarks (Figure 2). VLE was then performed.



Figure 2: VLE Scan data from initial endoscopy was used to identify a slightly discolored region proximal to the BE segment in squamous tissue. Electrocautery marks were placed on both sides, and are visible here using NBI.

VLE

Volumetric Laser Endomicroscopy

The BE and proximal squamous regions were imaged using the NvisionVLE Imaging System. Proximal to the squamo-columnar junction (SCJ), VLE re-confirmed the suspicious subsquamous findings from the initial endoscopy 8 weeks earlier (Figure 1, Figure 3). The electrocautery marks were also visible under VLE, and outlined the subsquamous abnormality well, which enabled a VLE-targeted endoscopic mucosal resection (EMR). The EMR was performed at the targeted site, and a high density of surveillance biopsies were also taken throughout the BE segment.

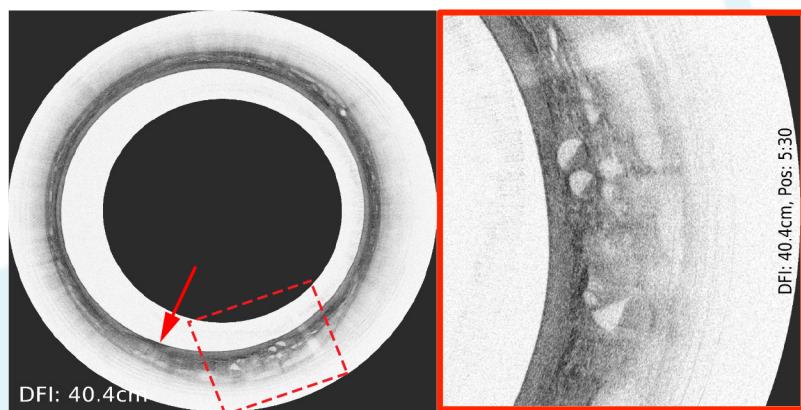
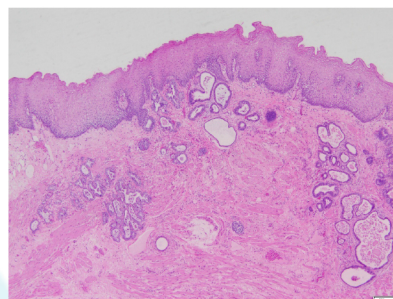


Figure 3: VLE scan data proximal to the BE segment that re-confirmed the subsquamous area of concern from the initial exam. Transverse scan (left) and highlighted region of interest (right). The distal-most electrocautery mark can be seen with VLE (red arrow) adjacent to the area of concern.

RESULTS

For the VLE-guided resection, pathology confirmed **subsquamous T1a adenocarcinoma with negative margins**. Surveillance biopsies from within the BE segment were all negative for dysplasia or cancer.

Figure 4: Low power pathology image from VLE-guided EMR specimen (right). Pathology confirmed subsquamous T1a adenocarcinoma with negative margins.



DISCUSSION

The intent of this procedure was to localize areas of biopsy-confirmed cancer with **no suspicious lesions under WLE or NBI**. Using the NvisionVLE® Imaging System, sub-squamous abnormalities were identified approximately 1 cm proximal to the BE segment, and used to guide an EMR. Abnormalities that included a large cluster of atypical subsquamous glandular structures were resected and confirmed by pathology as **subsquamous T1a adenocarcinoma with negative margins**. The localization and resection of this subsquamous abnormality led to a curative resection of the cancer in this patient. Although continued studies will be required to prove the broader impact of Advanced OCT in the management of Barrett's related dysplasia and cancer, its impact on this particular patient and their treatment is undeniable.



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The NvisionVLE® Imaging System is indicated for use as an imaging tool in the evaluation of human tissue microstructure, including esophageal tissue microstructure, by providing two-dimensional, cross-sectional, real-time depth visualization, and may be used to mark areas of tissue. The safety and effectiveness of this device for diagnostic analysis (i.e. differentiating normal versus specific abnormalities) in any tissue microstructure or specific disease has not been evaluated.

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