



CASE STUDY: VLE for Pre-Treatment Planning

PATIENT HISTORY

68 year old male diagnosed with nodular long-segment Barrett's Esophagus (BE) (C9M9) by outside hospital, and underwent two previous combination treatments of Radiofrequency Ablation (RFA) and Endoscopic Mucosal Resection (EMR). Random four-quadrant biopsies were also taken:

Pathology results from the random biopsies were **negative for dysplasia/malignancy**.

Pathology result from the EMR was hyperplastic columnar mucosa with Intestinal Metaplasia; **negative for dysplasia / malignancy**.

The patient was referred to Ochsner Health System for EGD w/ VLE as a follow-up surveillance exam.

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Figure 1: EMR site at 32cm

PROCEDURE

ENDOSCOPIC EXAM

C9M9 noted with GEJ identified at 37cm. A 3cm hiatal hernia was identified. There were esophageal mucosal changes secondary to established long-segment Barrett's Esophagus. These changes involved the mucosa at the upper extent of the gastric folds. Circumferential salmon-colored mucosa was present from 28cm to 37cm. Positive visible nodules proximally. No Ulcers noted. EMR site noted at 32cm. (Figure 1)

VLE

Volumentric Laser Endomicroscopy

Four areas of concern were identified using Advanced OCT :

- . 36.5 cm at 9:00 - Irregular surface with multiple atypical glands (Figure 2)
- . 35.8 cm at 9:00 - Irregular surface with multiple atypical glands (Figure 3)
- . 35.3 cm at 9:00 - Irregular surface with septated glands (Figure 4)
- . 34.1 cm at 8:30 - Irregular surface with multiple irregular, necrotic glands (Figure 5)

VLE-targeted biopsies were taken at each site

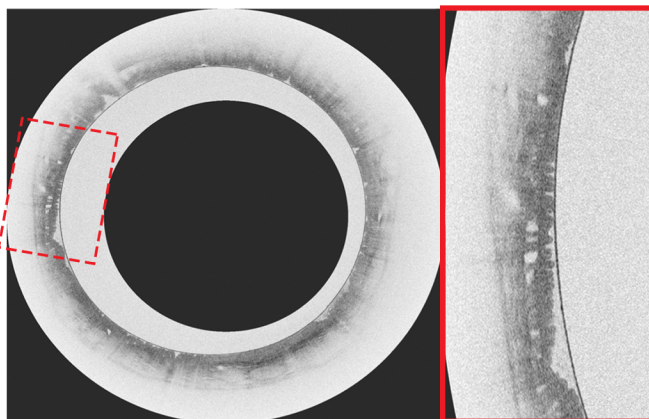


Figure 2: VLE image of irregular surface and glandular atypia

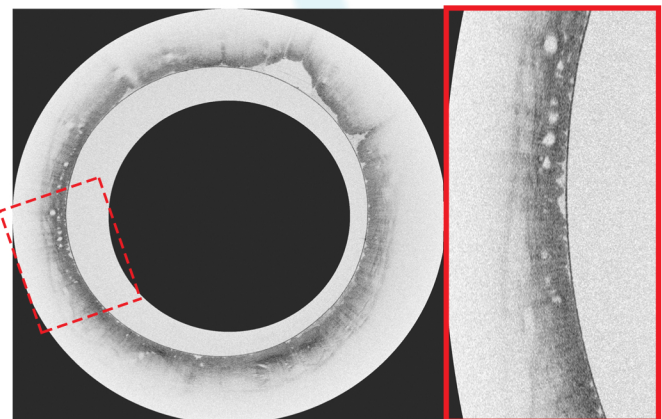


Figure 3: VLE image of irregular surface and glandular atypia

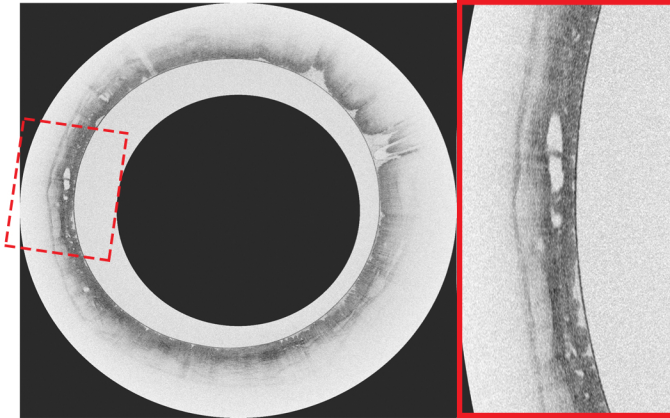


Figure 4: VLE image of irregular surface with septated, irregular glands

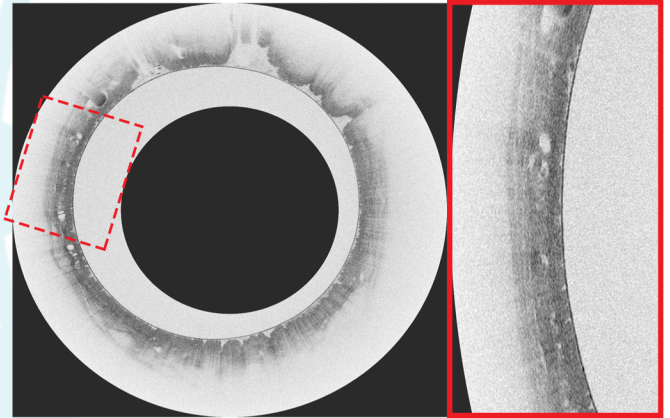


Figure 5: VLE image of irregular surface with necrotic glandular atypia

RESULTS

The pathology result for the VLE-targeted biopsies from 34 to 35cm was positive for Intestinal Metaplasia with **Low Grade Dysplasia (LGD)** (Figure 6).

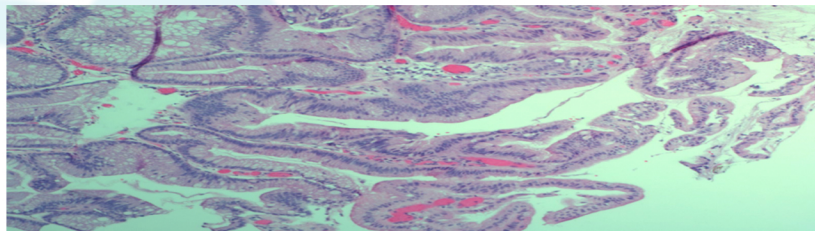


Figure 6: VLE-Targeted Biopsy Positive for LGD

DISCUSSION

The NvisionVLE Imaging System generated volumetric high-definition images of the esophagus that aided in the identification of abnormal areas not seen using traditional imaging methods, nor found using four-quadrant random biopsies. Only the VLE-targeted biopsy targets were positive for LGD. The type of therapy chosen was also informed by the VLE data, given the relative depth approximation: it appeared that the irregular glands were deep enough to be better-treated using Cryotherapy. This case shows the demonstrated promise of Advanced OCT in the targeting of occult disease, and potentially as an input to therapy choice.



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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. 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.