



Wide Area Transepithelial Sampling (WATS^{3D}) Improves Detection of Barrett's Esophagus Following Endoscopic Ablation

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BACKGROUND

- Barrett's Esophagus (BE) is a pre-malignant condition characterized by goblet cell metaplasia in the tubular esophagus
- Techniques such as radiofrequency ablation (RFA) and liquid nitrogen spray cryotherapy (LN2SC) allow for effective outpatient endoscopic eradication of Barrett's tissue
- Surveillance using 4 quadrant forceps biopsies (FB) at least every 2 centimeters (cm) throughout a current or prior BE segment leaves a large percentage of tissue unsampled
- WATS^{3D} is a promising technique that allows for more extensive sampling across a mucosal surface area using a brush device
- Prior studies demonstrated the benefit of adjunctive use of WATS^{3D} with FB to improve detection of both BE and dysplasia^{1,2}
- There have been no published studies evaluating the potential role of WATS^{3D} in surveillance following endoscopic BE ablation

OBJECTIVE

- Evaluate whether adjunctive WATS^{3D} brush biopsy use, in addition to standard 4 quadrant forceps biopsies, improves detection of residual or recurrent BE in patients undergoing post-ablation surveillance endoscopy

METHODS

- 31 patients were found to have no visual evidence of BE following either RFA or LN2SC from January 1, 2012 to September 30, 2012
- WATS^{3D} brush biopsies were obtained using the standard 2-brush technique, and samples were sent to a central laboratory (CDx Laboratories, Suffern, NY) for analysis
- 4 quadrant FB then were obtained every 1 cm following a modified Seattle protocol, and specimens were reviewed by Temple's expert GI pathologist
- Results from both sets of samples were integrated to obtain a final diagnosis

PATIENT DEMOGRAPHICS AND FINDINGS

Case	Gender	Age	Original Dysplasia Grade ¹	Original BE Length ²	Ablation Method ³	FB Results ⁴	WATS ^{3D} Results ⁴	Case	Gender	Age	Original Dysplasia Grade ¹	Original BE Length ²	Ablation Method ³	FB Results ⁴	WATS ^{3D} Results ⁴
1	F	48	NDBE	C0M3	RFA	Negative	Negative	16	M	43	Indefinite	C0M1	RFA	Negative	Negative
2	M	76	LGD	C0M1	RFA	NDBE	Negative	17	F	36	NDBE	C4M4	LN2SC	BE/Indefinite	Negative
3	F	48	LGD	C0M1	RFA	NDBE	NDBE	18	M	73	LGD	C2M5	RFA	Negative	Negative
4	F	55	NDBE	C9M9	RFA	Negative	Negative	19	F	50	HGD	C0M1	RFA	NDBE	Negative
5	M	80	HGD	C0M3	RFA	Negative	Negative	20	M	71	Indefinite	C0M1	RFA	Negative	Negative
6	M	55	HGD	C9M9	LN2SC	Negative	NDBE	21	M	56	NDBE	C6M8	RFA	Negative	Negative
7	M	64	LGD	C0M2	RFA	Negative	Negative	22	M	55	HGD	C9M9	LN2SC	NDBE	Negative
8	M	65	HGD	C0M5	RFA	Negative	NDBE	23	M	75	HGD	C0M1	RFA	Negative	NDBE
9	M	68	HGD	C8M8	RFA	Negative	Negative	24	M	59	LGD	C1M5	RFA	Negative	Negative
10	F	75	HGD	C0M1	RFA	Negative	Negative	24	M	66	HGD	C0M3	LN2SC	Negative	NDBE
11	M	42	NDBE	C0M1	LN2SC	Negative	Negative	26	F	73	NDBE	C0M5	RFA	NDBE	Negative
12	M	67	NDBE	C0M3	RFA	Negative	Negative	27	M	42	NDBE	C0M1	LN2SC	Negative	Negative
13	F	70	HGD	C0M5	RFA	Negative	Negative	28	M	52	NDBE	C2M5	RFA	Negative	Negative
14	M	50	HGD	C4M5	RFA	Negative	Negative	29	M	80	HGD	C0M3	RFA	Negative	Negative
15	F	66	Indefinite	C0M1	RFA	Negative	Negative	30	M	68	HGD	C8M8	RFA	Negative	Negative
								31	M	65	HGD	C0M5	RFA	NDBE	Negative

1. NDBE: Non-dysplastic BE, LGD: Low Grade Dysplasia, HGD: High Grade Dysplasia
 2. Prague Classification Score: C (length in cm of circumferential BE) and M (maximum BE length in cm)
 3. RFA: Radiofrequency Ablation, LN2SC: Liquid Nitrogen Spray Cryotherapy
 4. Negative: No goblet cell metaplasia seen, NDBE: Non-dysplastic BE, BE/Indefinite: BE Indefinite for Dysplasia

RESULTS

- The study cohort included 9 females (29%) and 22 males (71%), with a mean age was 60.9 years
- Prior to ablation, 9 patients (29%) had short segment BE (SSBE), and 22 (71%) had long segment BE (LSBE)
- Pre-ablation mean Prague Classification scores were C of 2.0 cm and M of 3.9 cm
- Initial dysplasia grades included HGD (14 patients), LGD (5), Indefinite for Dysplasia (3) and NDBE (9)
- Agreement in surveillance biopsy diagnosis between FB and WATS^{3D} was seen in 21 of 31 cases (67.7%)
- Residual or recurrent BE was identified in 11 of 31 cases (35.5%)
- 1 patient was diagnosed with BE on both FB and WATS^{3D} specimens
- 6 patients were diagnosed with BE only on FB specimens: 4 who originally had LSBE and 2 who had SSBE
- 4 patients were diagnosed with BE only on WATS^{3D} specimens: 3 who originally had LSBE and 1 with SSBE
- When added to FB, WATS^{3D} increased the post-ablation BE detection rate by 57.1% (4/7)

CONCLUSIONS

- WATS^{3D} increased the detection rate for residual or recurrent Barrett's esophagus by 57.1% when used as an adjunctive technique to 4 quadrant forceps biopsies following radiofrequency ablation or liquid nitrogen spray cryotherapy
- Wide area brush sampling may be of particular benefit after ablation of long segments of Barrett's esophagus, where 4 quadrant biopsies leave a large total surface area unevaluated
- WATS^{3D} is a low-cost, efficient sampling method that appears to have utility in multiple aspects of Barrett's management
- Additional studies with larger patient cohorts are needed to confirm these findings and clarify the optimal use of this technique

REFERENCES

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