Comparing the Adenoma Detection Rate of Endocuff-Assisted Colonoscopy (EAC) Against Combined Artificial Intelligence and Endocuff-Assisted Colonoscopy (AEAC)

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BACKGROUND

- Colorectal cancer (CRC) is the second leading cause of cancer-related mortality in the world
- While effective at preventing CRC, standard colonoscopy can miss precancerous polyps
- Endoscopic mechanical attachments and computer-aided polyp detection technologies have been shown to improve adenoma detection rate (ADR)
- Presently, few studies have investigated how combining these modalities affects ADR

PURPOSE

- To compare the performance of Endocuff-assisted colonoscopy (EAC) to combined AI and Endocuff-assisted colonoscopy (AEAC) with respect to our primary outcome (ADR) and secondary outcomes which include polyp detection rate (PDR), adenomas per colonoscopy (APC), polyps per colonoscopy (PPC), sessile serrated lesion rate (SSR), sessile serrate lesions per colonoscopy (SSPC), and withdrawal time

METHODS

- We performed a single-center retrospective chart review study involving patients who underwent either EAC or AEAC at the NYU Langone Ambulatory Care Center between December 2021 and May 2022
- We collected demographic and clinical data on patients from the electronic health record
- Categorical variables were analyzed using a two-sided chi square test
- Continuous variables were assessed using the student's t-test or Mann-Whitney U-test
- Odds ratios (OR) and 95% confidence intervals (CI) were calculated using logistic regression

RESULTS

- 148 patients (74 AEAC vs 74 EAC) met inclusion criteria
- ADR in the AEAC group was higher (71.6% vs 60.8%; OR 1.63; 95% CI 0.82-3.24; *P* = 0.17)
- SSR in the AEAC group was higher (24.3% vs 14.9%; *P* = 0.15)
- Subgroup analysis revealed that ADR trended towards significance for patients in the AEAC group undergoing colonoscopy for CRC screening (70.3% vs 52.3%; OR 2.17; 95% CI 0.94-4.98; *P* = 0.068)

Table 1. Patient Demographics and Lesion Detection Rates

Variable	EAC (n=74)	AEAC (n=74)	*P*
Mean age (SD), y	60.8 (9.7)	61.0 (9.9)	0.91
Sex, n (%)			0.87
Male	38 (51.4)	37 (50)	
Female	36 (48.6)	37 (50)	
Indication for colonoscopy, n (%)			0.08
Screening	44 (59.5)	54 (73)	
Surveillance	30 (40.5)	20 (27)	
Mean BBPS (SD)	8.6 (0.8)	8.5 (0.9)	0.55
Median withdrawal time (IQR), min*	7.3 (6.6-8.2)	8.0 (7.3-8.7)	0.03
Patients with ≥1 adenoma (ADR), n (%)	45 (60.8)	53 (71.6)	0.17
Adenomas per colonoscopy (APC), (range)	1.43 (0-12)	1.45 (0-5)	0.96
Patients with ≥1 polyp (PDR), n (%)	66 (89.2)	70 (94.6)	0.23
Polyps per colonoscopy (PPC), (range)	2.55 (0-13)	2.62 (0-16)	0.85
Patients with ≥1 sessile serrated lesion (SSR), n (%)	11 (14.9)	18 (24.3)	0.15
Sessile serrated lesions per colonoscopy (SSPC), (range)	0.23 (0-4)	0.27 (0-2)	0.67

Abbreviations: EAC, Endocuff-assisted colonoscopy; AEAC, artificial intelligence and EAC; SD, standard deviation; BBPS, Boston Bowel Preparation scale; IQR, interquartile range; PDR, polyp detection rate; PPC, polyps per colonoscopy; ADR, adenoma detection rate; APC, adenomas per colonoscopy; SSR, sessile serrate lesion rate; SSPC, sessile serrated lesions per colonoscopy
*There was 1 case missing data in the EAC cohort

Table 2. Per-Patient Lesion Analysis

Variable	EAC (n=74)	AEAC (n=74)	*P*
Adenoma location, n (%)**			
Right colon	31 (41.9)	33 (44.6)	0.74
Transverse colon	16 (21.6)	17 (23)	0.84
Left colon	22 (29.7)	26 (35.1)	0.48
Adenoma size, n (%)**			
1-5 mm	40 (54.1)	39 (52.7)	0.87
>5-10mm	11 (14.9)	21 (28.4)	0.05
>10 mm	8 (10.8)	11 (14.9)	0.46
Polyp location, n (%)**			
Right colon	34 (45.9)	42 (56.8)	0.19
Transverse colon	22 (29.7)	22 (29.7)	1.00
Left colon	49 (66.2)	51 (68.9)	0.73
Polyp size, n (%)**			
1-5 mm	62 (83.8)	55 (74.3)	0.16
>5-10mm	15 (20.3)	24 (32.4)	0.09
>10 mm	8 (10.8)	12 (16.2)	0.34
Sessile serrated lesion location, n (%)**			
Right colon	3 (4.1)	10 (13.5)	0.08
Transverse colon	7 (9.5)	3 (4.1)	0.33
Left colon	5 (6.8)	6 (8.1)	1.00
Sessile serrated lesions size, n (%)**			
1-5 mm	5 (6.8)	5 (6.8)	1.00
>5-10mm	3 (4.1)	8 (10.8)	0.21
>10 mm	4 (5.4)	6 (8.1)	0.75

Abbreviations: EAC, Endocuff-assisted colonoscopy; AEAC, artificial intelligence and EAC
** refers to the number of patients with ≥1 adenoma/polyp/sessile serrated lesion

CONCLUSION

- Combining AI with Endocuff-assisted colonoscopy increased ADR, PDR, APC, PPC, SSR and SSPC when compared to EAC
- This study highlights the potential benefits of maximizing surface area exposure (mechanical enhancement) combined with enhanced mucosal inspection (AI)
- Future larger studies will be needed to further validate this combination