Visible and Invisible Dysplasia: Likelihood of Colorectal Cancer Diagnosis

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Background

- Ulcerative colitis and Crohn's disease are inflammatory bowel diseases (IBD) that affect the gastrointestinal tract.
- Patients with IBD are at an increased risk for colorectal cancer (3).
- Abnormal cell characteristics (dysplasia) have been associated with pre-cancerous lesions for colorectal cancer.
- Visible dysplasia can be seen with the naked eye during colonoscopy.
- Invisible dysplasia cannot be seen with the naked eye during colonoscopy.
- Random biopsies are collected, with consent, during colonoscopies in order to look for invisible dysplasia.
- We propose that white light endoscopy and chromoendoscopy techniques enhance identification of dysplasia during colonoscopy procedures (2)

Methods

Study Cohort
Polyps, n=1603
IBD patients, n=728
Surveillance procedures, n=945

Record of Patient Characteristics
Age at index procedure
Gender
Smoking history
Family history of colorectal cancer
Primary Sclerosing Cholangitis (PSC) diagnosis and date
History of random prior to index procedure
Date of IBD diagnosis

Polyp Characterization
Polyp size
location
pathology type
number of polyps per patient
prevalence of dysplasia in polyps
prevalence of dysplasia in random biopsies
degree of inflammation in endoscopy
degree of inflammation in biopsies

Record of Polyp Extraction Protocols
Bowel preparation condition
Random biopsy collection
Polyp level procedure method
- Chromoendoscopy
- White light endoscopy

Data Analysis
Statistical analysis was performed by Ryan J. Lennon, Principal Biostatistician, Mayo Clinic Rochester, MN

Results

- Frequency of inactive disease was higher in endoscopic scoring than histological scoring.
- Frequency of severe inflammation was higher in endoscopy than histology.
- Frequency of moderate inflammation was comparable in both endoscopy and histology.
- Frequency of mild inflammation was higher in histology than endoscopy.
- The odds of detecting random dysplasia significantly increased as the degree of histological inflammation increased and as the degree of endoscopic inflammation increased.

Histo \ Endo	Inactive	Mild	Moderate	Severe	Total Endoscopic
Inactive	475	113	7	0	595
Mild	82	131	25	1	239
Moderate	5	47	32	0	84
Severe	0	8	17	2	27
Total Histologic	562	299	81	3	945

Table 1. Crosstabulation of concordance between endoscopic and histologic inflammation scoring.

Endoscopic Inflammation	Random Dysplasia (N=26)	No Dysplasia (N=933)	Histologic Inflammation	Random Dysplasia (N= 26)	No Dysplasia (N= 933)
Inactive	11 (44.0%)	581 (63.2%)	Inactive	6 (24.0%)	557 (60.5%)
Mild	5 (20.0%)	234 (25.5%)	Mild	13 (52.0%)	286 (31.1%)
Moderate	5 (20.0%)	81 (8.8%)	Moderate	6 (24.0%)	75 (8.1%)
Severe	4 (16.0%)	23 (2.5%)	Severe	0 (0.0%)	3 (0.3%)
Odds Ratio P-Value	2.00 (1.35, 2.96) <0.001		Odds Ratio P-Value	2.53 (1.54, 4.16) <0.001	

Table 2. Logistic regression model assessing the association between odds of dysplasia in random biopsies and degree of endoscopic and histologic inflammation.

References

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Conclusion

- Marked variability in degree of inflammation between histology and endoscopy evaluation for IBD patients who have undergone a colonoscopy with biopsies.
- Increased endoscopic and histological inflammation correlate strongly with detecting dysplasia in random biopsies.