CHROMOENDOSCOPY

OF THE GASTEROINTESTINAL TRACT

THESIS

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This work was done by and for the sake of patients. May God alleviate their sufferings and accept our honest intentions to dedicate this work for the sake of their own benefit.

Amel Salem

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LIST OF ABBREVIATIONS

ADR	**Adenoma Detection Rate**
AGA	**American Gastroenterology Association**
AMSP	**Absent microstructural pattern**
BE	**Barrett's esophagus**
CCD	**Charged coupled device**
CIMP	**CpG Island Methylator Phenotype**
COX	**Cyclooxygenase**
CRC	**Colorectal carcinoma**
CTC	**Computed tomographic colonography**
CUC	**Chronic ulcerative colitis**
DM	**Diabetes mellitus**
EME	**Enhanced magnification endoscopy**
EMR	**Endoscopic mucosal resection**
FICE	**Fujinon Intelligent Color Enhancement**
FJP	**Familial juvenile Polyposis**
FOBT	**Fecal occult blood testing**
GEJ	**Gastroesophageal junction**
GERD	**Gastroesophageal reflux disease**
GI	**Gastrointestinal**
GIT	**Gastrointestinal tracte**
H and E	**Hematoxylin –Eosin**
H2RAs	**H2 Receptor Antagonists**
HGIN	**High -grade intraepithelial neoplasia**
HNPCC	**Hereditary non-polyposis colorectal cancer**
HPS	**Hyperplastic Polyposis syndrome**
IBD	**Inflammatory bowel disease**
IMSP	**Irregular microstructural pattern**
IMVP	**Irregular microvascular patterns**
JPC	**Juvenile Polyposis coli**
k	**kappa**
MB	**Methylene blue**
NBI	**Narrow band imaging**
NSAIDs	**Nonsteroidal anti-inflammatory drugs**
PIVI	**Preservation and Incorporation of Valuable Endoscopic Innovation**
PJS	**Peutz-Jeghers syndrome**
PPI	**Proton pump inhibitor**

RGB	**Red , green, blue**
RMVP	**Regular microvascular patterns**
SAs	**Serrated adenomas**
SD-WL	**Standard-definition white-light**
SIM	**Specialized intestinal metaplasia**
SSPs	**Sessile serrated polyps**
UC	**Ulcerative colitis**
WLE	**White –light endoscopy**
WT	**Withdrwal time**

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Abstract

Background: Chromoendoscopy, or Chromoscopy, refers to the topical application of stains or dye at the time of endoscopy in an effort to enhance tissue characterization, differentiation, or diagnosis. The continued rise in the incidence of adenocarcinoma of the esophagus has fueled resurgent interest in the use of a variety of endoscopic and nonendoscopic techniques to improve the diagnosis of Barrett's esophagus and associated dysplasia/cancer. ***Objective***: To use chromoendoscopy & NBI for the characterization and the classification of the mucosal morphology in nondysplastic BE and in BE with HGIN& to discriminate neoplastic from non-neoplastic polyps at screening sigmoidoscopy will obviate the need for histologic diagnosis and could have the potential for great cost saving. ***Design:*** Descriptive study. ***Patients& methods:*** We used chromoendoscopy & NBI to image and biopsy randomly selected areas in 80 patients with BE & in patients with colonic polyps. ***Results:*** Our study have shown a high significant benefit of MB chromoendoscopy over SD-WLE in identification of both intestinal metaplasia and dysplasia in Barrett's esophagus (P-value < 0.0001). The study have shown also a significant benefit of N.B.I over SD-WLE in identification of dysplasia in Barrett's esophagus (P-value 0.002) & There is a statistically significant difference in polyp histology prediction by using NBI or indigocarmine chromoendoscopy over SD-WL colonoscopy for both adenomatous & hyperplastic polyps (P-value < 0.001). ***Conclusions:*** Indigocarmine chromoendoscopy had the highest sensitivity, specificity& accuracy in predicting adenomas in real time during colonoscopy using a Kudo pit pattern classification & the use of MB chromoendoscopy& NBI resulted in the diagnosis of more neoplastic areas than with SD-WLE, with NBI had the highest sensitivity& MB chromoendoscopy had the highest specificity& accuracy in predicting dysplasia.

Keywords:

Chromoendoscopy
Methylene blue
Barrett's esophagus
Narrow band imaging (NBI)
Colonic polyps

INTRODUCTION

Introduction

Chromoendoscopy, or Chromoscopy, refers to the topical application of stains or dye at the time of endoscopy in an effort to enhance tissue characterization, differentiation, or diagnosis. Chromoendoscopy is distinguished from endoscopic tattooing, which involves the injection of a long-lasting pigment (e.g., India ink) into tissue for future localization ***(Ginsberg GG, et al., 2002)***.

It provides additional diagnostic information regarding the epithelial morphology and pathophysiology. Based on experience gathered mainly in Japan, chromoendoscopy is now in more widespread use, particularly to identify preneoplastic and neoplastic lesions. The most promising technique is the depiction of squamous epithelium neoplasia of the esophagus with Lugol's solution, staining of Barrett's mucosa by methylene blue, including the potential to identify neoplasia, and the demarcation of neoplasia with indigocarmine in the stomach and colon for local endoscopic resection. Innovative application and refinement of the existing ones are soon to be expected ***(Peitz U., 2002).***

Studies on chromoendoscopy have reported different classifications for the mucosal patterns in nondysplastic BE. Little, however, is known about the surface-pattern characteristics of high-grade intraepithelial neoplasia (HGIN). In addition, chromo endoscopy is operator dependant and labor intensive, requiring the use of staining solutions, spraying catheters, and multiple water rinses ***(Connor MJ, et al., 2004).***

The mucosal morphology consists of both mucosal and vascular patterns. The detection of the superficial vascular patterns, however, is difficult with chromoendoscopy, because the staining solution may obscure visualization of blood vessels.
In Narrow Band Imaging NBI, RGB (red, green, blue) filters with narrow Band pass ranges and a higher relative intensity of blue light are used.

These filters enable better visualization of the mucosal patterns, because blue light allows for optimal superficial imaging. In addition, NBI reveals the superficial vasculature, because of absorption of the blue light by Hb ***(Gono K, et al., 2004).***