HISTOPATHOLOGICAL & STATISTICAL STUDY OF NEOPLASTIC AND NONNEOPLASTIC COLORECTAL POLYPS

Thesis Submitted for Partial Fulfillment Of
The Master Degree in Pathology

Presented by

Yasmine Fathy El-Esawy

M.B., B.CH

Supervisors

Prof. Dr. Ali Ahmed Fouad Al-Hindawy

Professor of pathology

Cairo University

Assistant Prof. Dr. Hossam El Deen Hussin Ahmed

Assistant Professor of pathology

Cairo University

Assistant Prof. Dr. Mostafa Mahmoud Khodeir

Assistant Professor of pathology

Cairo University

Faculty of Medicine

Cairo University

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ABSTRACT

Aim of Work: Analysis of colorectal polyps cases in 5 years duration, to detect rate of occurrence of different types. Statistical evaluation of all available data in the request sheets and the pathological findings of cases is done.

Methods: Slides and data were obtained from archives of pathology department, Faculty of Medicine, Cairo University, Kasr El Aini Hospitals (2006-2010).

Results: 225 colorectal polyps cases were studied, 168 are nonneoplastic polyps and 57 are neoplastic polyps. The mean age of patients with nonneoplastic polyps is 36.6 years; while that of patients with neoplastic polyps is 51.2 years. The male predominance is clear in the results of this study as the male to female ratio in nonneoplastic polyps is 1.8:1 and of the neoplastic polyps is 2:1. The presenting symptom in this study is bleeding per rectum, being the main symptom in 67.2% of cases. The rectal region is the most common segment involved, 49.7% of polyps are found in the rectum. Most of the nonneoplastic polyps are pedunculated (51%) while the majority of neoplastic polyps are sessile (77.8%). The tubular adenoma is the most common type representing 47% of the adenomatous polyps. Most adenomas are of low grade dysplasia. Mixed hyperplastic adenomatous polyps represent 8.4% of colorectal polyps, while serrated adenomas represent 1.8% of colorectal polyps. Hyperplastic polps are the most common type in non neoplastic polyps (44%), followed by hamartomatous polyps (35%).

Recommendations: Understanding the natural occurrence and the features of colorectal polyps is crucial in any CRC prevention strategy. A CRC screening program represents an urgent need nowadays.

Key words: Colorectal polyps, epidemiology, risk factors, classification, adenomas, serrated polyps, dysplasia, polyposis syndromes, screening.

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LIST OF ABBREVIATIONS

AAPC	Attenuated Adenomatous Polyposis Coli
ACF	Aberrant crypt foci
APC	Adenomatous Polyposis Coli
BMI	Basal Metabolic Index
CRC	Colorectal carcinoma
COX-2	Cyclooxygenase 2
CS	Cowden syndrome
CSPY	Colonoscopy
CTC	Computed tomographic colonography
DALM	Dysplasia Associated Lesion or Mass
DCBE	Double-contrast barium enema
DCC	Deleted colon cancer
FAP	Familial Adenomatous Polyposis
FSIG	Flexible sigmoidoscopy
GST-Pi	Human placental glutathione S- transferase
gFOBT	guaiac-based fecal occult blood test
GI	Gastrointestinal
HP	Hyperplastic polyp
HNPCC	Herediatry Non-Polyposis Colon Cancer
LKB1	Liver kinase B1
LOH	Loss of heterozygosity
JPS	Juvenile polyposis syndrome
MALT	Mucosa-Associated Lymphoid Tissue
MAP	MUTYH- associated polyposis
MEN	Multiple endocrine neoplasia
MGMT	Methylguanine DNA methyltransferase
MHAP	Mixed hyperplastic adenomatous polyp

MSI	Microsatellite Instability
NF1	Neurofibromatosis type 1
NSAID	Non-Steroidal Anti-Inflammatory Drug
PTEN	Phosphatase and tensin homolog
SA	Serrated adenoma
sDNA	Stool DNA test
SSA	Sessile serrated adenoma
STK	Serine threonine kinase
TSA	Traditional serrated adenoma
WHO	World Health Organization

Introduction

With the increase in the number of screening colonoscopic procedures, the gastrointestinal tract has now become more accessible to clinical investigators. Polyps are amongst the most common lesions biopsied and/or removed at the time of colonoscopy. The term “Polyp” derives from the Greek for “multiple feet” (poly, many and pes, feet) or “little nipple”. In clinical practice a polyp is defined as “a circumscribed protrusion above the mucosa, stalked or sessile” **(Maratka, 1989)**.

The apparent yield of colonoscopy in terms of polyp detection is at least 24% **(Cooper et al, 2005)**. The biological behavior of a polyp relates entirely to its pathological nature; hence the importance of an accurate histological diagnosis. Colorectal polyps are classified histologically as neoplastic or non-neoplastic. Those polyps that arise as the result of proliferation and dysplasia are termed adenomatous polyps or adenomas. They are true neoplastic lesions and precursors of carcinoma **(Burgart, 2002)**.

The risk of cancer developing within an adenoma increases with size, grade of dysplasia and villosity. These features, together with polyp numbers, are also predictive of metachronous neoplasia **(Jass et al, 2006)**.

Adenomas are classified microscopically as tubular, tubulovillous or villous adenomas. The tubular adenomas are composed of branched tubules of dysplastic tissue while villous adenomas contain frond-like villiform extensions of dysplastic epithelium; tubulovillous are typically intermediate between tubular and villous adenomas. Dysplasia can be classified as low grade or high grade **(Jass, 2002)**.

In the United States autopsy studies, adenomas are present in 20% at age 40 years, 50% at age 60; almost all have tubular adenomas, <5% have tubulovillous or villous adenomas **(Sturl et al, 2006)**. 30% develop new polyps after mean 26 month follow up; higher risk if 3 or more adenomas and at least one in proximal colon **(Bonithon-Kopp et al, 2004)**.

Differential diagnosis is extremely variable. Beside adenomas, other types of polypoid lesions include hyperplastic polyps (90% of all polyps), serrated adenomas, hamartomatous polyps, and inflammatory polyps **(De Leon and Di Gregorio, 2001)**.

Previously, hyperplastic polyps were perceived as harmless lesions without any potential for malignant progression mainly because hyperplastic polyps are missing cytological atypia. However, **Urbanski et al in (1984)** reported the first case of colonic adenocarcinoma arising within a polyp with the mixed histology of a hyperplastic polyp and tubular adenoma.

In (**1990), Longacre and Fenoglio-Preiser** classified and named "serrated adenoma (SA)" and "mixed hyperplastic adenomatous polyp (MHAP)" to differentiate it from other types of polyps and to emphasize its neoplastic nature.

Since then, evidences revealed that the lesions, formerly classified as hyperplastic, represent a heterogeneous group of polyps with characteristic serrated morphology some of which exhibit a significant risk of sporadic colorectal cancer through a distinct pathway via mechanism of DNA microsatellite instability **(Goldstein et al, 2003)**.

Serrated lesions (excluding traditional serrated adenomas TSAs and mixed lesions) could be subdivided into polyps with "abnormal" proliferation

(sessile serrated polyp) and those with "normal" proliferation (hyperplastic polyps) **(Torlakovic et al, 2003)**.

Diagnostic criteria and nomenclature for these lesions are not uniform and, therefore, somewhat confusing. Therefore, standardization of nomenclature and diagnostic criteria as well as recommendations for clinical management of these polyps is important **(Aust and Baretton, 2010).**

Encountering numerous colorectal polyps during a colonoscopy should prompt consideration of several potential diagnoses, which may have very different treatment strategies. The differential diagnosis for colorectal polyposis encompasses genetic syndromes and underlying inflammatory conditions that often require coordinated endoscopic, medical, and surgical management **(Perencevich, 2011)**.