

NEOPLASTIC POLYPS OF THE COLON

Definitions

Polyp: non-specific clinical term describing a projection from the surface of mucosa regardless of its histological composition.

Neoplastic polyp: Epithelial growth composed of abnormal glands of large bowel

- **adenomatous polyp:** an adenoma which has not invaded the muscularis mucosa
- **malignant polyp:** an adenoma in which a focus of carcinoma has invaded beyond the muscularis mucosa into the submucosa.

Pathology

Gross Description

- **Pedunculated polyp:** extending from the mucosa via fibrovascular stalk
- **Sessile polyp:** protruding directly from the colonic wall
- **Size**
 - <5mm (diminutive polyp): fewer than 1% are villous or contain severe dysplasia
 - Characterized as <1cm, 1-2cm, >2cm

Histological Characteristics

- **Glandular Architecture: WHO classification**
 - **Tubular Adenoma** (80% of glands are tubular and branched): 80-86% of all polyps
 - **Tubulovillous Adenoma:** 8-16% of all polyps
 - **Villous Adenoma** (80% of glands are villiform): 3- 16% of all polyps
 - Generally larger, more frequently sessile, and greater likelihood of neoplasia and dysplasia
- **Dysplasia:** subjectively characterized based on cytological and architectural features
 - mild, moderate, severe.
 - carcinoma in situ
 - low grade and high grade dysplasia

PERCENT WITH CARCINOMA						
Size	Histological Type			Degree of Dysplasia		
	Tubular	Tubulovillous	Villous	Mild	Moderate	Severe
<1cm	1	4	10	0.3	2	27
1-2cm	10	7	10	3	14	24
>2cm	35	46	53	42	50	48

Adenoma-Carcinoma Sequence

- Dukes of St. Mark's Hospital London 1926.
- Jackman and Mayo coined the term 'Adenoma-Carcinoma Sequence' in 1951
- Circumstantial evidence based on population studies: concurrence of adenomas & carcinomas
- FAP and HNPCC
- De Novo carcinoma
- Molecular Genetics

Epidemiology

Incidence and Prevalence of Adenomas

- True prevalence rate is only now being elucidated
- Average risk of individuals over age 40 is between 24-47%
- Inherent risk of colon cancer
- Age – single most important independent determinant
- Gender
- Family history of colorectal cancer

Risk Factors for Adenoma Development

- **Heredity**
 - Hereditary polyposis and nonpolyposis syndromes
 - 95% of adenomas or carcinomas arise in people who do not have these syndromes
 - 2 to 3 fold greater risk of colon cancer if first degree relative has colonic cancer or adenoma
- **Environment – Dietary and lifestyle risk factors**
 - Protective effect against adenomas:
 - Dietary fiber; plant foods; carbohydrates; high folate; physical activity
 - Increased adenoma risk:
 - Excess dietary fat; alcohol; cigarette smoking; obesity
 - Factors under investigation
 - Aspirin; NSAIDS; anti-oxidants (beta-carotene, vitamin C and E)
- **Conditions Associated with Adenomatous Polyps**
 - Strong association: Ureterosigmoidostomies; strep bovis bacteremia; acromegaly;
 - Unclear association: Skin tags; atherosclerosis and cholesterol; breast cancer; cholecystectomy;

Diagnosis

Symptoms and Signs

- Usually Asymptomatic
- Most common presenting symptom: occult or overt rectal bleeding
- Unusual Symptoms: constipation, flatulence and diarrhea (uncommon secretory diarrhea syndrome)

Detection

- colonoscopy
- fecal occult blood testing
- sigmoidoscopy
- barium enema
- Newer methods

Management

Adenomatous Polyps

- Total excision of a polyp is the only method of providing a thorough and accurate histological diagnosis
- With the advent of colonoscopy there is no justification to observe polyps for change except when the risk of colonoscopy is too great

Malignant Polyps

- **Classification**

- Pedunculated

Haggit Scale: levels 1,2 and 3 have <1% risk of nodal disease

- 0 – within mucosa
- 1 – penetration of muscularis mucosa
- 2 – invasion of neck of the polyp
- 3 – invasion of stalk of the polyp
- 4 – invasion of bowel submucosa

- Sessile (all are Haggit 4)

Kudo scale

- sm1 – upper third of the submucosa
- sm2 – middle third of the submucosa
- sm3 – lower third of the submucosa

12-25% have nodal metastasis

Is endoscopic polypectomy alone sufficient if invasive carcinoma is found on polypectomy?

- If not, what features predict presence of residual disease or future recurrence?
- Important to differentiate between carcinoma in-situ and invasive carcinoma
- 10% of malignant polyps are associated with an adverse outcome after polypectomy
- Presence of one or more risk factors increase percentage of adverse outcomes from 10 to 25%

General Recommendations

- **Post Polypectomy Management**

If adenoma excision is complete then, endoscopic polypectomy is adequate in:

- Adenomas that contain carcinoma in-situ.
- Pedunculated, well-differentiated adenomas
- Uncomplicated polypoid carcinomas

Resection surgery indicated in malignant polyps in which the invasive cancer is:

- Poorly differentiated
- Involves lymphatics or blood vessels
- Extends within 2mm of the polypectomy margin
- Involves the submucosa of the colonic wall. (all sessile polyps)

Post Polypectomy Management

- Polyp Recurrence Rates
 - Long term retrospective studies: cumulative risk of adenoma recurrence 20% at 5yrs, 50% at 15yrs
 - National Polyp Study: overall adenoma recurrence 32-42%
 - Synchronous: 13-50% of resected specimens for colon and rectal cancer harbor one or more adenomas
 - Metachronous: patients who have undergone resection are at increased risk subsequent adenoma. Metachronous rate is approx. 4% with an average time of 10 years
- Surveillance
 - National Polyp Study: 1 year follow-up study had a low yield
 - Complete colonoscopy at time of polypectomy
 - Interval between repeat colonoscopy based on risk profile of patient
- High risk: every 3years
- Low risk : every 5 years

Colon Cancer Risk In Liver Transplant Recipients

- Fabia et al. reported increased risk of colon cancer in patients with coexistent UC and OLT
- Atassi et al. reported increased risk of developing colorectal adenoma after OLT

References:

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3. Nivatvongs S, Gordon PH, Neoplasms of the colon rectum and anus, QMP, St. Louis 2000.
4. Atassi T, Thuluvath PJ. Risk of colorectal adenoma in liver transplant recipients compared to immunocompetent control population undergoing routine screening colonoscopy. J Clin Gastroenterol. 2003;37(1):72-73.
5. Fabia R, Levy MF, Testa G, Obiekwa S, Goldsten RM, Husberg BS, Gonwa TA, Klintmalm GB, Colon carcinoma in patients undergoing liver transplantation. American J of Surgery. 1996;176:265-266.

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Table 114-1 | Classification of Colorectal Polyps

NEOPLASTIC MUCOSAL POLYPS	
Benign (adenoma)	
Tubular adenoma	
Tubulovillous adenoma	
Villous adenoma	
Malignant (carcinoma)	
Noninvasive carcinoma	
Carcinoma in situ	
Intramucosal carcinoma	
Invasive carcinoma (through muscularis mucosae)	
NON-NEOPLASTIC MUCOSAL POLYPS	
Hyperplastic polyp (metaplastic polyp)	
Normal epithelium (in a polypoid configuration)	
Juvenile polyp (retention polyp)	
Peutz-Jeghers polyp	
Inflammatory polyps	
Inflammatory bowel disease	
In bacterial infections or amebiasis	
Schistosomiasis	
Cap polypoid	
SUBMUCOSAL LESIONS	
Colitis cystica profunda	
Pneumatosis cystoides intestinalis	
Lymphoid polyps (benign and malignant)	
Lipomas	
Carcinoids	
Metastatic neoplasms	
Other rare lesions	

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Table 114-9 | Risk Factors for Adverse Outcomes in Patients with Malignant Polyps

	FAVORABLE (LOW RISK)	UNFAVORABLE (HIGH RISK)
Degree of differentiation	Well or moderate	Poor
Invasion of veins or lymphatics	Absent	Present
Polypectomy margin	Clear or >2-mm margin	Involved
Invasion of submucosa of bowel wall	Absent	Present

Model of colorectal carcinogenesis

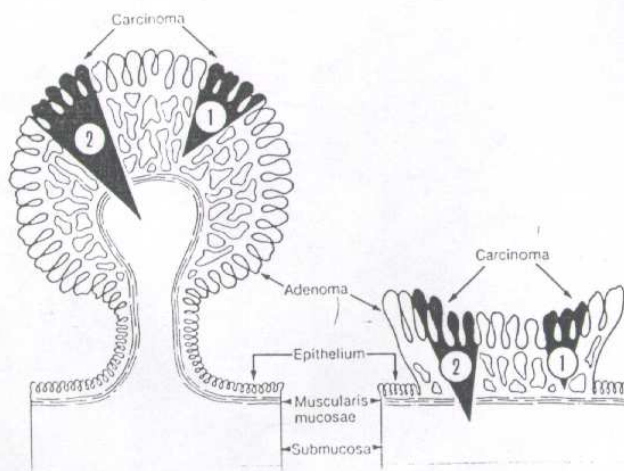
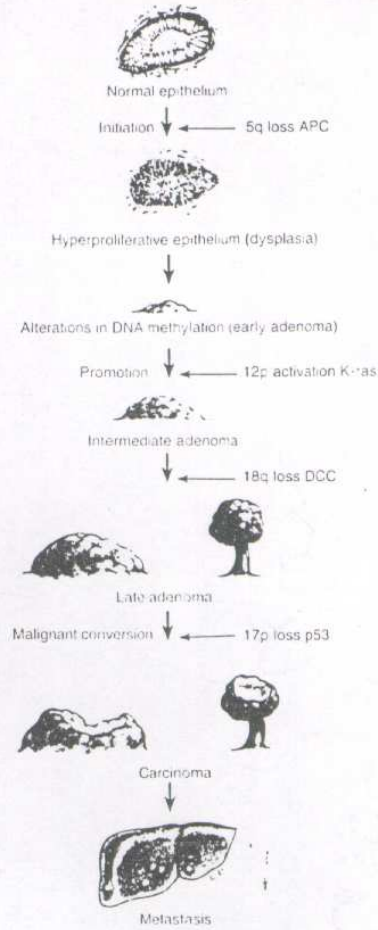


Figure 114-8. Carcinoma in situ versus invasive cancer. Carcinoma (shaded dark) is considered intramucosal or carcinoma in situ, as indicated by ① either in a pedunculated adenoma (left) or in a sessile adenoma (right). This lesion, as a rule, does not metastasize. Carcinoma in an adenomatous polyp is considered invasive when it breaches the muscularis mucosae, as indicated by ②. Invasive cancer in a pedunculated polyp is unlikely to metastasize, but it is managed differently from invasive cancer in a sessile polyp, which often requires surgical resection. Some pathologists use the Haggitt classification for cancer within an adenomatous polyp. For the pedunculated polyp shown on the left, the cancer depicted as ① corresponds to Haggitt level 0, while the cancer depicted as ② would be Haggitt level 1. If the cancer extends to the junction of the polyp with the normal mucosa, the Haggitt level would be 2, whereas if the cancer invades the stalk, it would be level 3. If the cancer encroaches on the submucosa or extends to the resection margin, it would be level 4. For the ses-