Adenomatous and Carcinomatous Changes within Hyperplastic Colonic Epithelium*

HARRY S. COOPER, M.D., ARTHUR S. PATCHEFSKY, M.D., GERALD MARKS, M.D.

From the Departments of Pathology and Surgery, Thomas Jefferson University Hospital, and the Jefferson Medical College, Philadelphia, Pennsylvania

HYPERPLASTIC (METAPLASTIC) POLYPS are benign, nonneoplastic proliferations with characteristic histologic features. Unlike tubular and villous adenomas, these polyps do not predispose the patient to large-bowel cancer.[1,6,7] We describe an unusual case of a patient with numerous hyperplastic colonic polyps in which the hyperplastic epithelium showed focal adenomatous changes and adenocarcinoma.

The patient, a 67-year-old white woman, complained of vague abdominal pain and an increase in the number of bowel movements each day. Barium-enema examination revealed a small polypoid lesion in the transverse colon, near the hepatic flexure. Colonoscopic examination and biopsy revealed a papillary carcinoma. The patient underwent resection of the ascending and transverse colon. Examination of the resection specimen revealed a small, somewhat raised lesion, approximately 1.5 × 1.0 ×

* Received for publication December 5, 1978.

Address reprint requests to Dr. Cooper: Department of Surgical Pathology, Room 7608, Thomas Jefferson University Hospital, 11th and Walnut Streets, Philadelphia, Pennsylvania 19107.

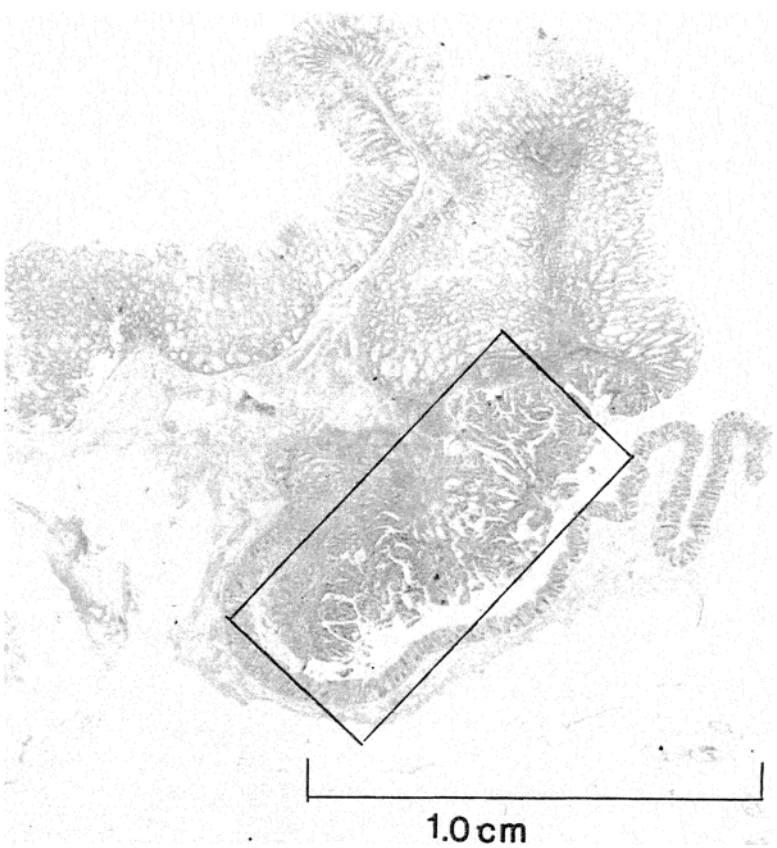

FIG. 1. Large hyperplastic polyp containing a papillary adenocarcinoma (*boxed area*). At this magnification, the difference between the normal mucosa (*right side of picture*) and the hyperplastic epithelium is apparent (hematoxylin and eosin; × 1).

0012-3706/79/0400/0152/$00.75

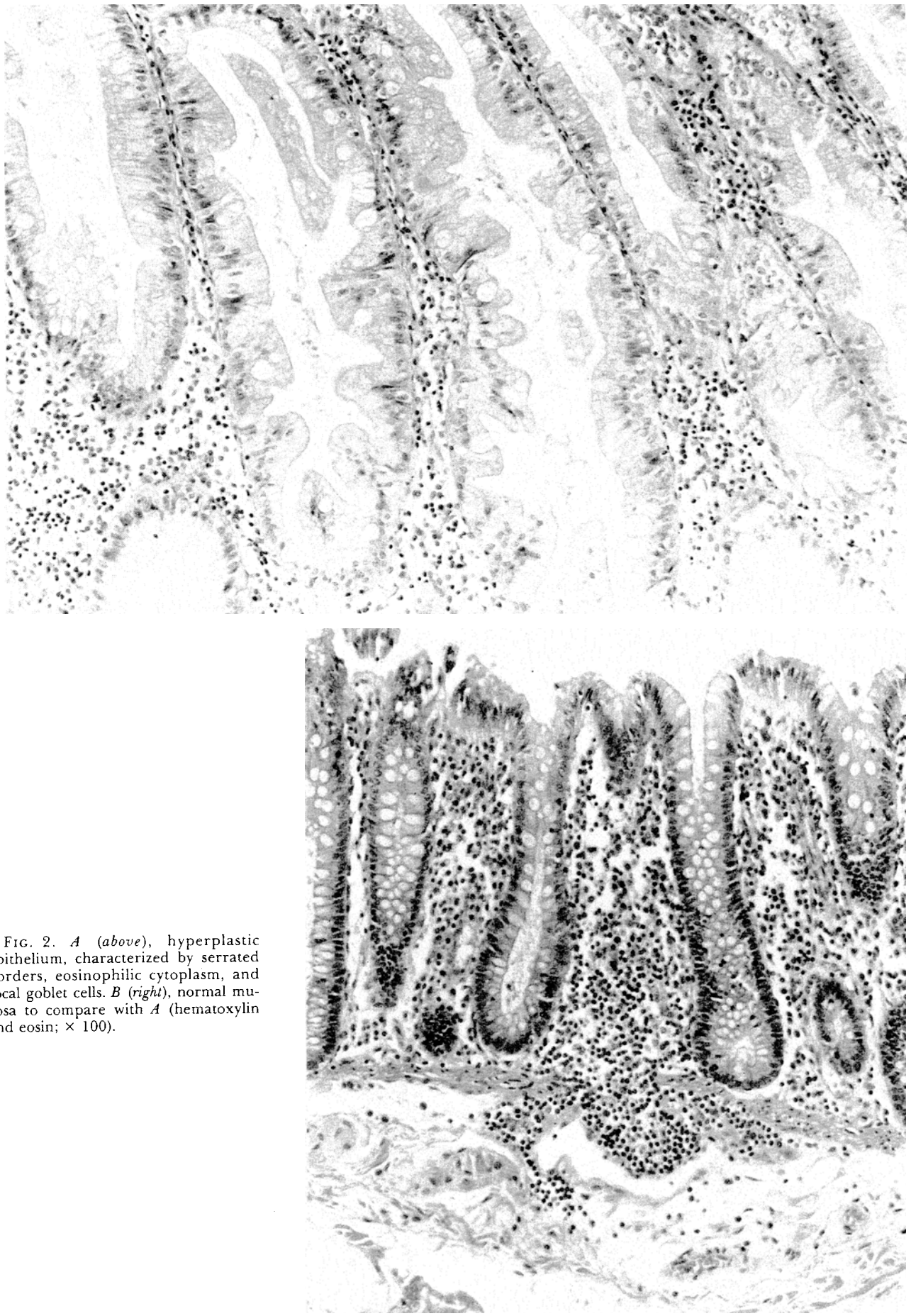

FIG. 2. *A* (*above*), hyperplastic epithelium, characterized by serrated borders, eosinophilic cytoplasm, and focal goblet cells. *B* (*right*), normal mucosa to compare with *A* (hematoxylin and eosin; × 100).

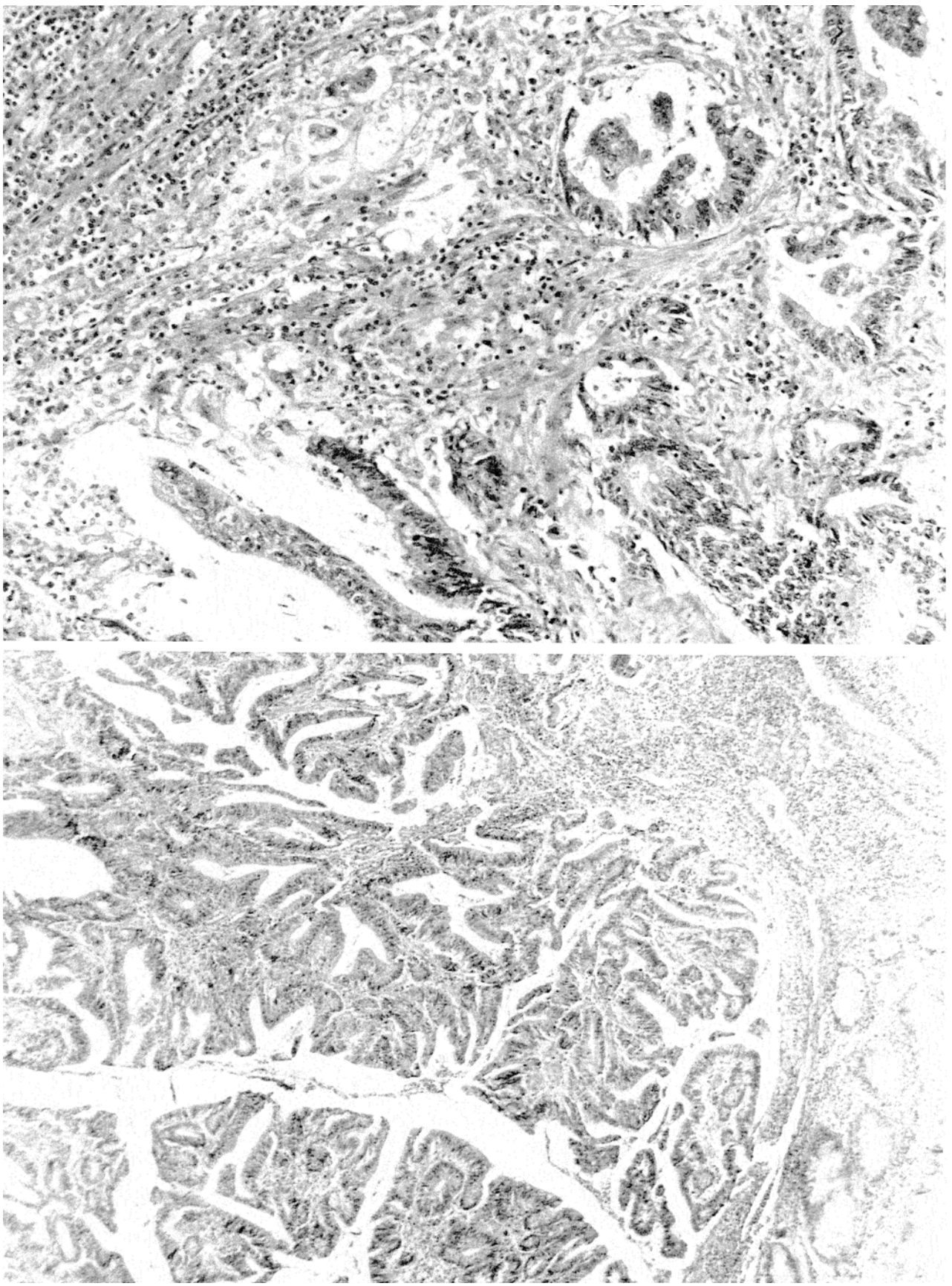

FIG. 3. *A (above)*, papillary adenocarcinoma. The hyperplastic epithelium can be seen at extreme left (hematoxylin and eosin; × 40). *B (below)*, focal areas of invasive carcinoma (hematoxylin and eosin; × 100).

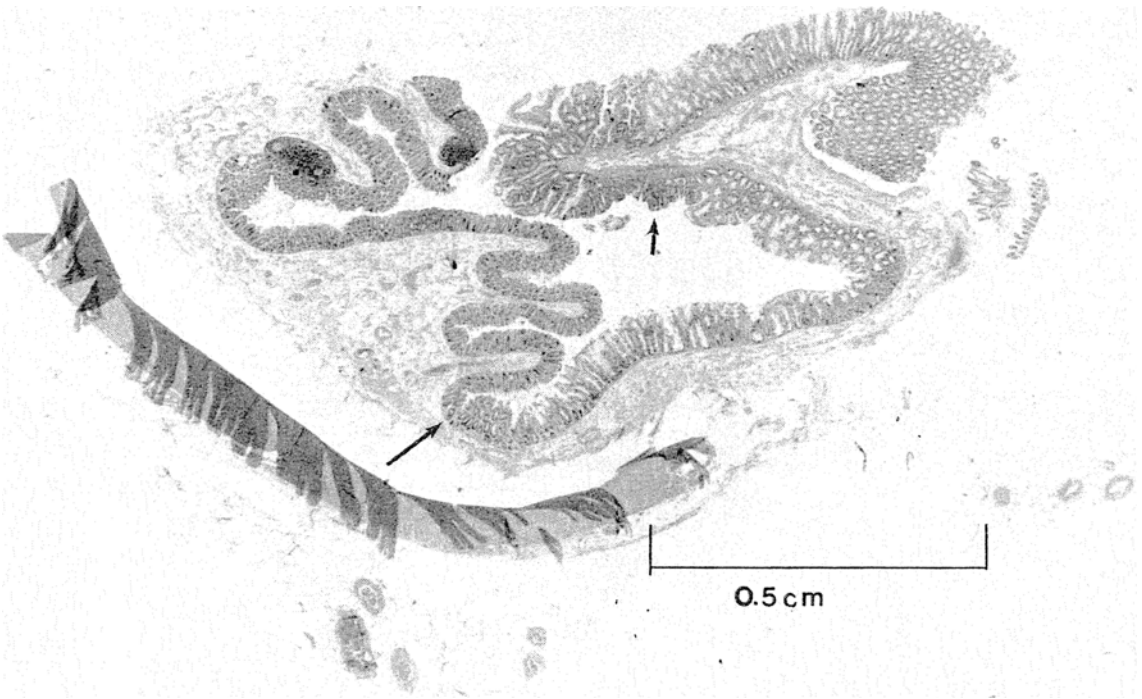

FIG. 4. Hyperplastic polyp containing focal adenomatous epithelium (*short arrow*). Normal mucosa is visible to the left of longer arrow and hyperplastic epithelium to the right (hematoxylin and eosin; × 1).

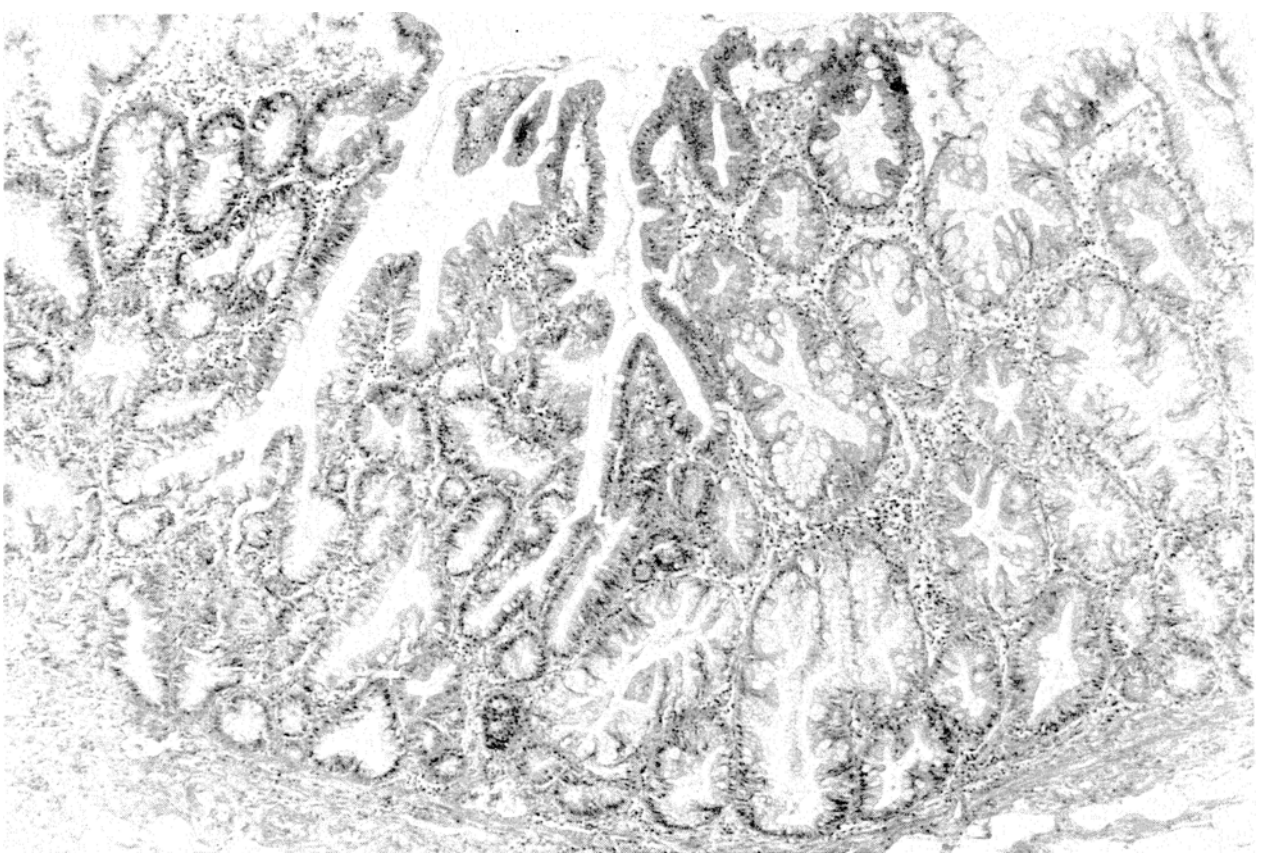

FIG. 5. Higher-power view of focal adenomatous epithelium (*left side of picture*) from Figure 4. Right side of picture shows hyperplastic epithelium (hematoxylin and eosin; × 100).

0.8 cm in size (Figs. 1–3). Adjacent to and continuous with this lesion were numerous hyperplastic polyps (Figs. 4 and 5). Microscopic examination revealed a papillary adenocarcinoma arising within a field of hyperplastic colonic epithelium. In the adjacent hyperplastic epithelium, there were also numerous foci of small islands of adenomatous epithelium.

Discussion

It is generally recognized that ordinary adenocarcinoma of the colon arises through a polyp–cancer sequence. However, not all colonic polyps are neoplastic, and only those polyps with adenomatous epithelium are capable of undergoing carcinomatous change.[8] Hyperplastic polyps are nonneoplastic epithelial proliferations, and their presence does not predispose the patient to colonic cancer.[1,6,7] Electron microscopic and radionuclide studies have shown that these polyps represent nothing more than a hypermaturation of the normal renewal process of the colonic epithelium.[3,4] Theoretically, a hyperplastic polyp showing adenomatous changes could evolve into cancer. Whittle *et al.* described a giant hyperplastic polyp with foci of atypia.[10] In a review of 154 hyperplastic polyps, Spjut and Estrada[9] found that one patient who had numerous hyperplastic polyps, had a large polyp that contained adenomatous epithelium. Among a series of patients with a total of 69 hyperplastic polyps, Kurzon *et al.*[5] found three cases of cancer admixed with hyperplastic polyps, which were thought to represent a response to the cancer, rather than malignant transformation. Goldman *et al.*[2] proposed that hyperplastic polyps may be a reservoir from which villous adenomas could be derived. This was based upon finding foci of hyperplastic polyps in seven villous adenomas, one hyperplastic polyp with focal villous adenomatous changes, and two villous adenomas with the overall configuration of a hyperplastic polyp, but with cytologic atypia. In two of the 10 cases studied, cancer was present. The Columbia group, with their vast experience with hyperplastic polyps, has not reported any of the above-mentioned findings.[1,7] Our patient had numerous hyperplastic polyps within which there were multifocal areas of adenomatous epithelium and carcinoma. Examination of 54 hyperplastic polyps, 86 villous adenomas, and 110 tubular adenomas from our surgical pathology files revealed two patients with focal hyperplastic epithelium within villous adenomas and one patient with a polyp that had the overall configuration of a hyperplastic polyp, but with foci of cytologic atypia. The polyps in these cases resembled some of those described by Goldman *et al.*[2]

As these hyperplastic polyps are nothing more than "hypermature colonic epithelium," they are probably able to react to neoplastic stimuli and undergo adenomatous changes similar to those of normal mucosa.[7] No doubt, in our case this finding was the exception rather than the rule, but it is interesting that hyperplastic mucosa is capable of undergoing adenomatous change and subsequent evolution into cancer.

Summary

Hyperplastic colonic polyps are benign, nonneoplastic proliferations; unlike tubular and villous adenomas, they do not predispose the patient to colonic cancer. Theoretically, these hyperplastic polyps, like normal colonic epithelium, should be able to undergo adenomatous transformation and possibly develop into cancer. In this report, we discuss an unusual case of a patient with numerous hyperplastic polyps, in which adenomatous changes occurred and cancer developed. We also discuss the significance of these changes as they relate to the polyp–cancer sequence.

Acknowledgment

The authors thank Dr. Nathan Lane, who reviewed the slides and concurred in the diagnosis.

References

1. Fenoglio CM, Kaye GI, Pascal RR, et al: Defining the precursor tissue of ordinary large bowel carcinoma: Implications for cancer prevention. Pathol Annu 12: 87, 1977
2. Goldman H, Ming S, Hickok DF: Nature and significance of hyperplastic polyps of the human colon. Arch Pathol 89: 349, 1970
3. Hayashi T, Yatani R, Apostol J, et al: Pathogenesis of hyperplastic polyps of the colon: A hypothesis based on ultrastructure and in vitro cell kinetics. Gastroenterology 66: 347, 1974
4. Kaye GI, Fenoglio CM, Pascal RR, et al: Comparative electron microscopic features of normal, hyperplastic, and adenomatous human colonic epithelium: Variations in cellular structure relative to the process of epithelial differentiation. Gastroenterology 64: 926, 1973
5. Kurzon RM, Ortega R, Rywlin AM: The significance of papillary features in polyps of the large intestine. Am J Clin Pathol 62: 447, 1974
6. Lane N, Kaplan H, Pascal RR: Minute adenomatous and hyperplastic polyps of the colon: Divergent patterns of epithelial growth with specific associated mesenchymal changes; contrasting roles in the pathogenesis of carcinoma. Gastroenterology 60: 537, 1971
7. Lane N, Lev R: Observations on the origin of adenomatous epithelium of the colon: Serial section studies of minute polyps in familial polyposis. Cancer 16: 751, 1963
8. Muto T, Bussey HJ, Morson BC: The evolution of cancer of the colon and rectum. Cancer 36: 2251, 1975
9. Spjut HJ, Estrada RG: The significance of epithelial polyps of the large bowel. Pathol Annu 12: 147, 1977
10. Whittle TS, Varner W,Brown FM: Giant hyperplastic polyp of the colon simulating adenocarcinoma. Am J Gastroenterol 69: 105, 1978