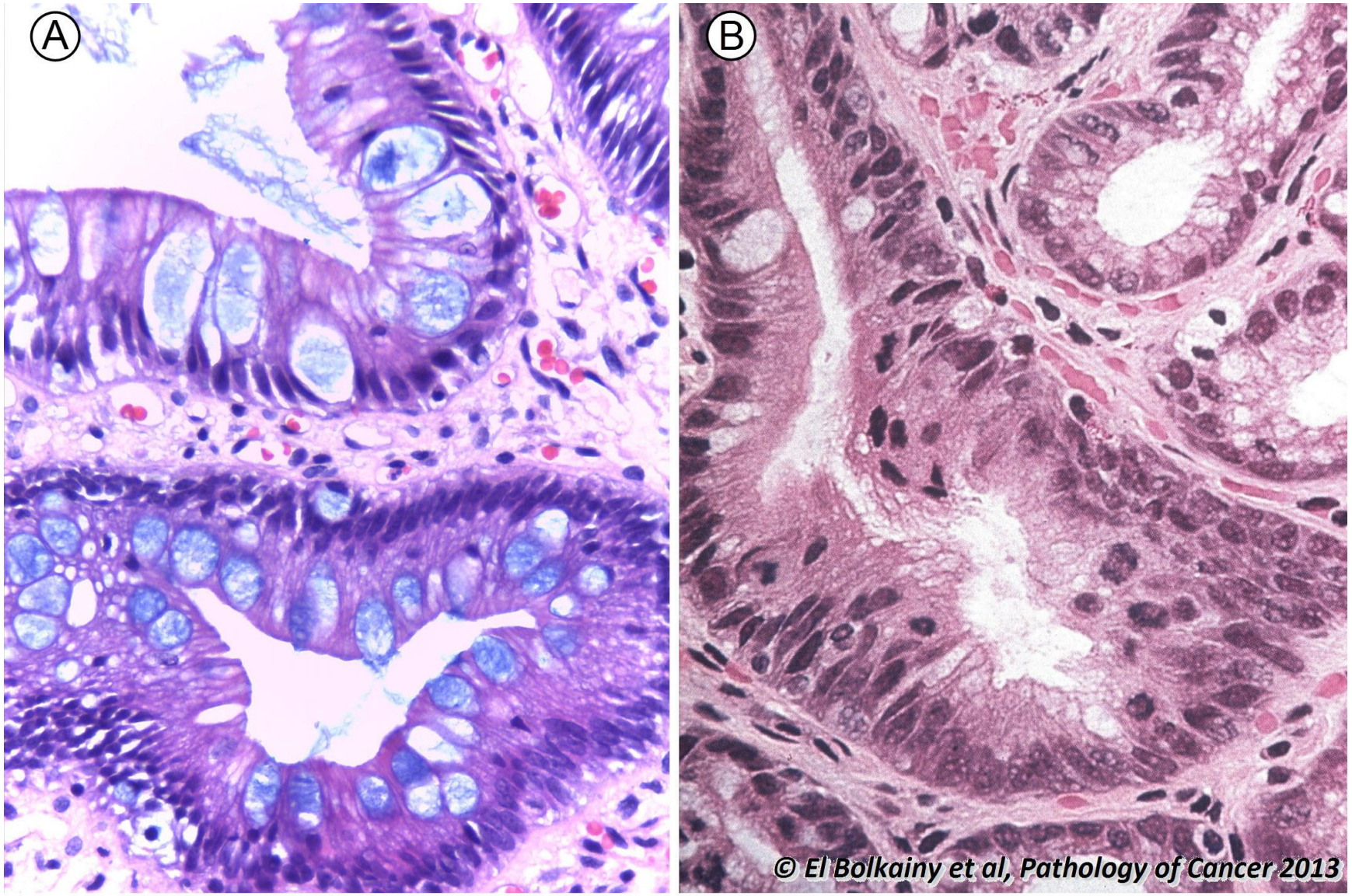
Chapter 13

Tumors of gastrointestinal tract

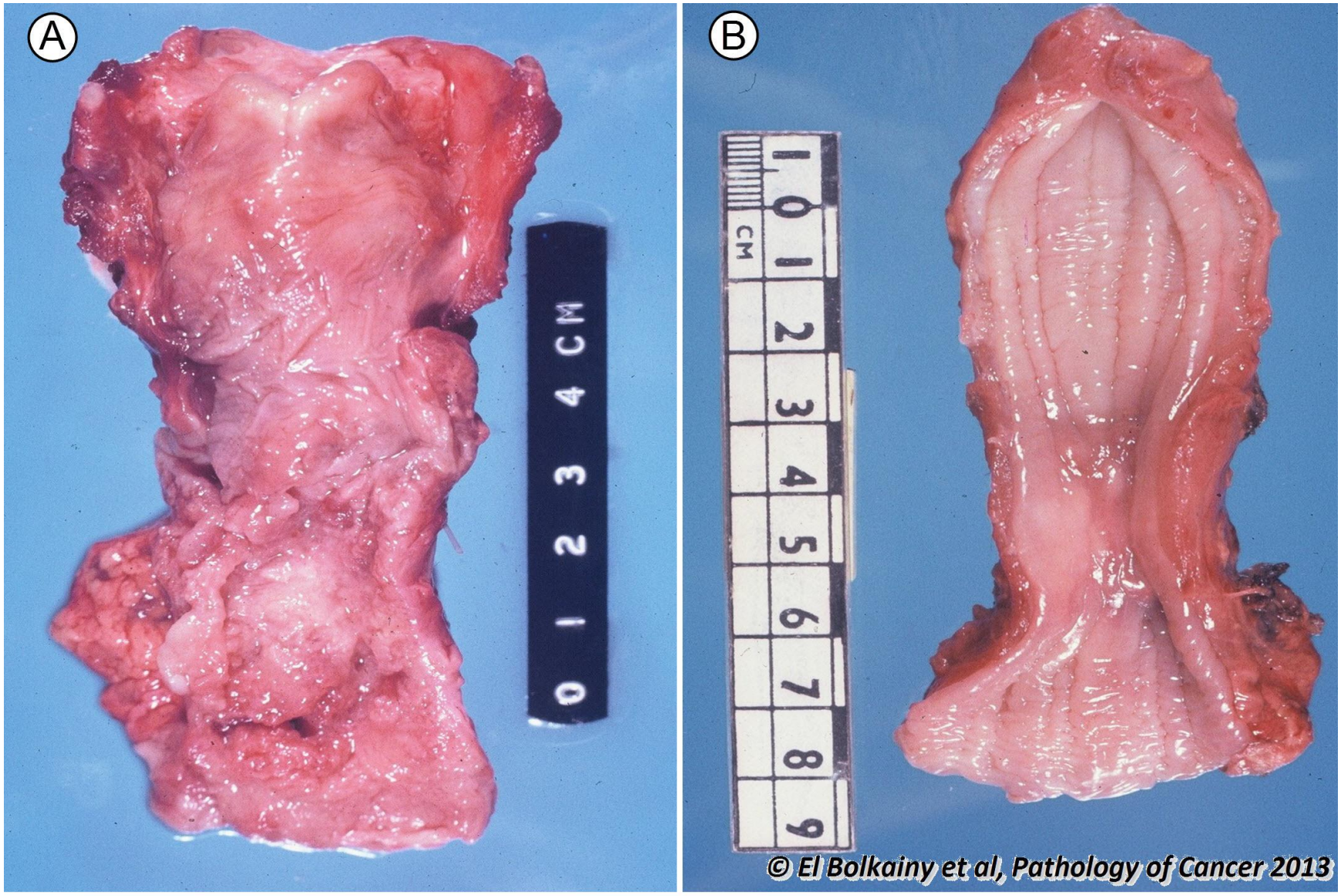
13.1 Barrett esophagus, histology.



Picture 13-1

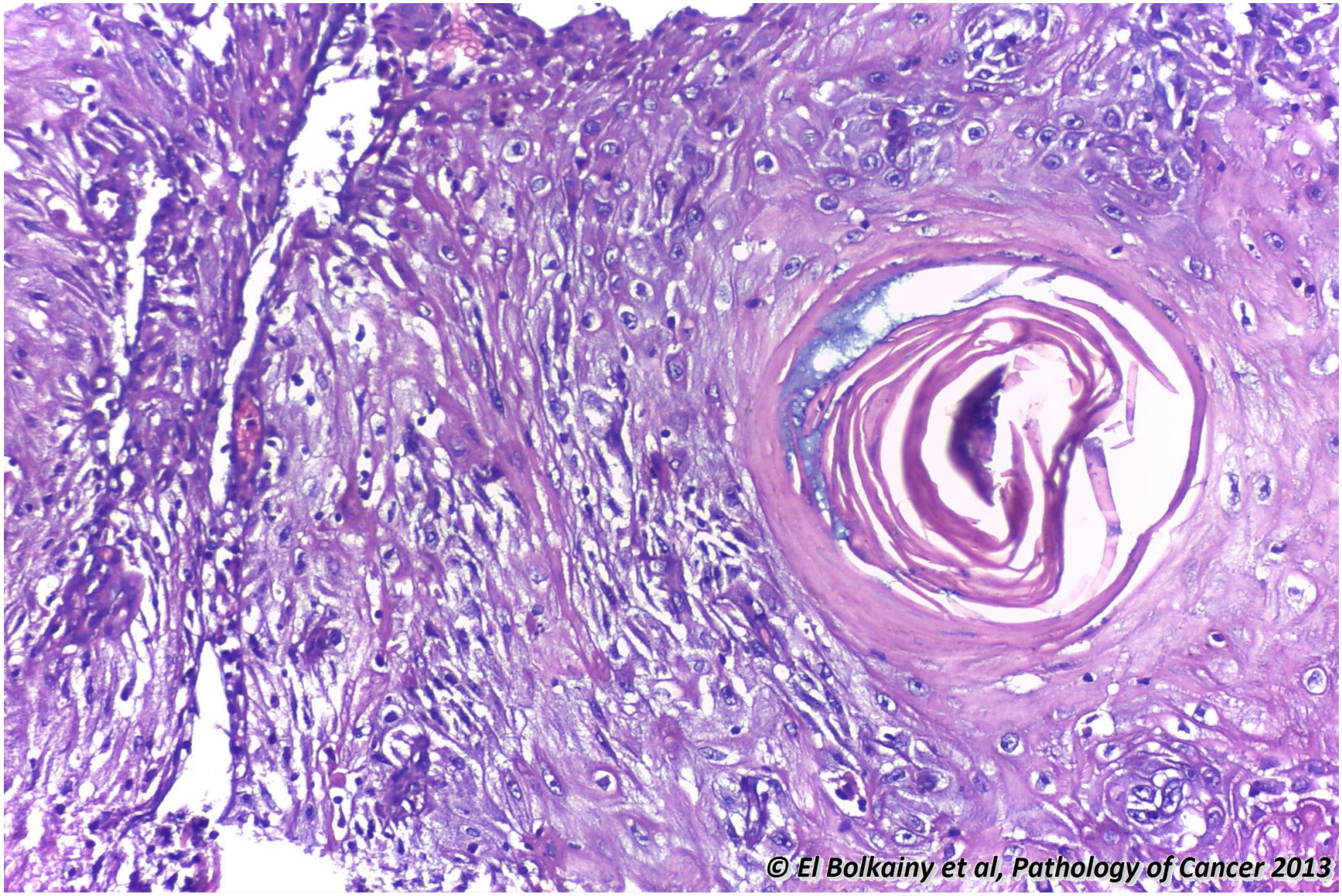
Barrett esophagus, histology. A and **B** The diagnostic criteria is both endoscopic (islands of velvety mucosa) and histologic (intestinal metaplasia) with goblet cells (Alcian blue positive) alternating with eosinophilic cells (foveolar or intestinal type). Barrett metaplasia (a precancerous lesion) complicates gastroesophageal reflux disease (GERD), histologically characterized by hyperplasia of basal cells of squamous epithelium and presence of intraepithelial inflammatory cells. Barrett-related adenocarcinoma is CK7+ and CK20-.

13.2 Esophageal carcinoma, gross features.



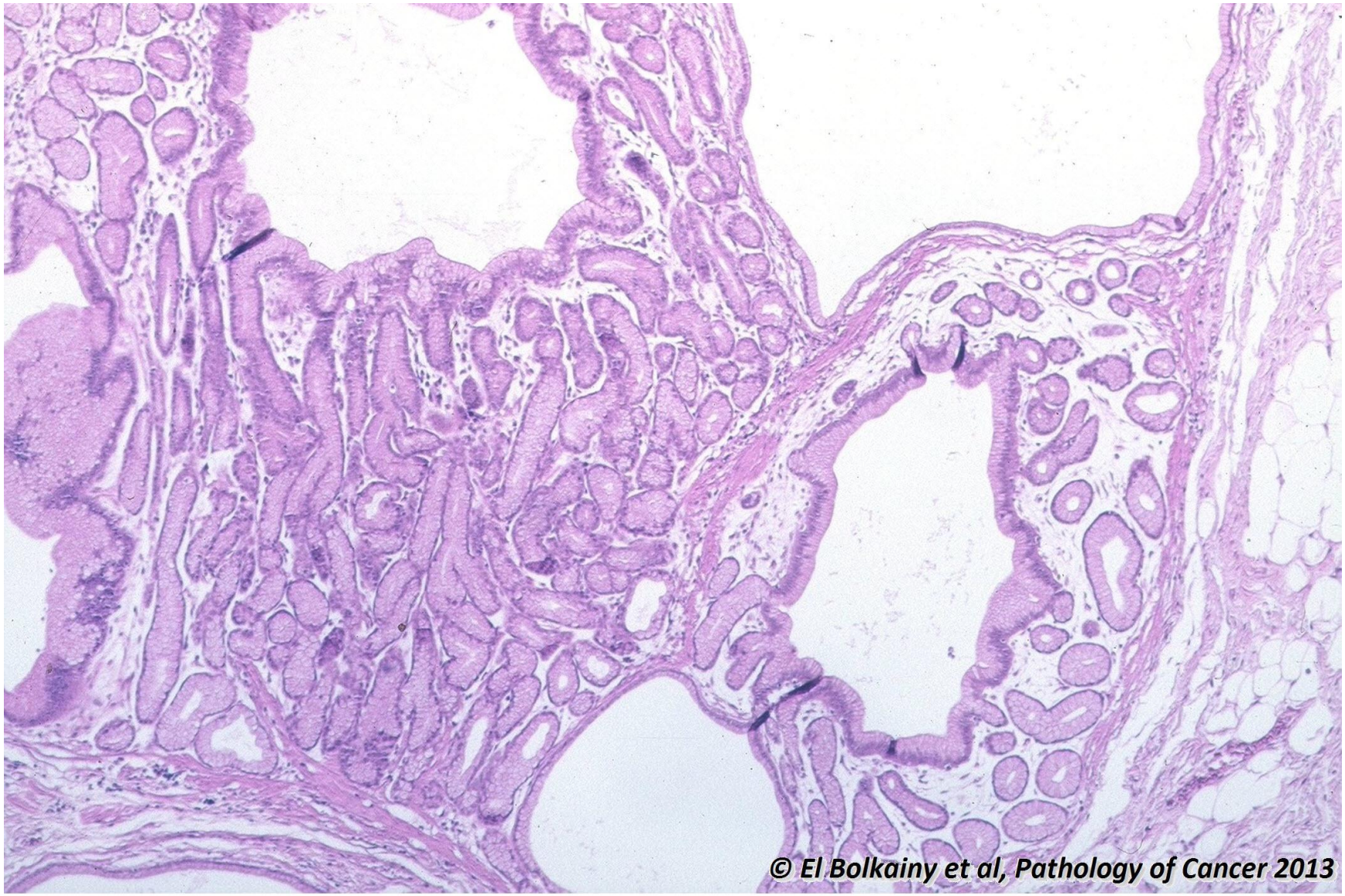
Picture 13-2 **Esophageal carcinoma, gross features. A** Carcinoma of lower esophagus is usually an adenocarcinoma and presents as malignant ulcer, whereas, **B** carcinoma of mid-esophagus is commonly squamous carcinoma and presents as a stricture.

13.3 Esophagus, invasive squamous cell carcinoma, histology.



Picture 13-3 **Esophagus, invasive squamous cell carcinoma, histology.** This histologic type affects the upper and middle esophagus. Tumor cells are keratinized with eosinophilic dense cytoplasm and cell nest formation.

13.4 Stomach, Mntrier's disease, histology.

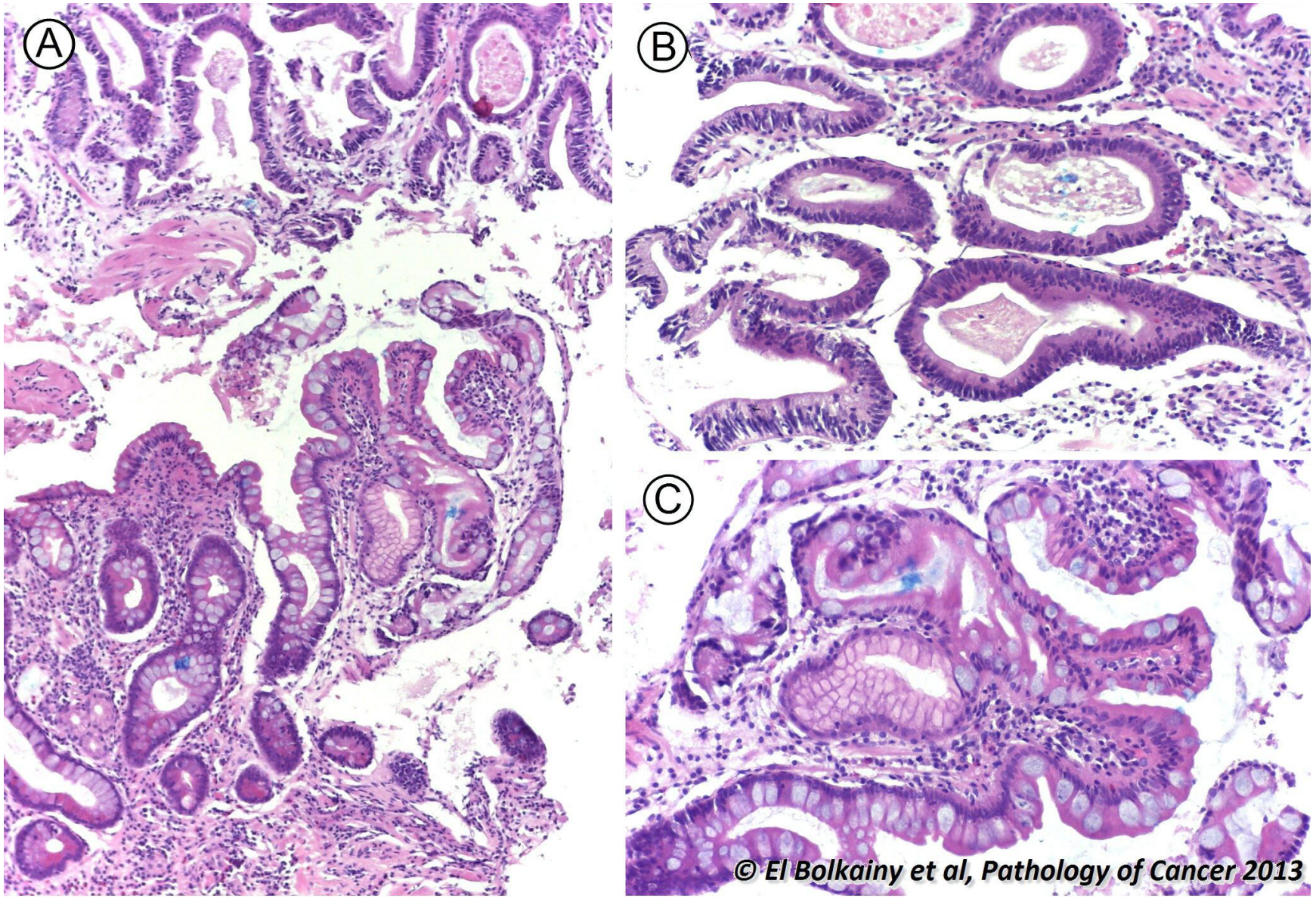


Picture 13-4 **Stomach, Menetrier disease, histology.** This is a precancerous lesion affecting glands of fundus due to increased expression of TGF-α. There is hyperplasia of foveolar epithelium (thick rugae) with cystic change, hyperplasia of muscularis mucosa, but, atrophy of fundic glands.

13.5 Gastric antrum, Helicobacter Pylori, Giemsa stain.

Picture 13-5 **Gastric antrum, Helicobacter Pylori, Giemsa stain.** The bacteria are commonly seen on surface of foveolar epithelium, appear as curved bacilli. They are present in 90% of patients with chronic active antral gastritis. The presence of neutrophils and plasma cells denotes active inflammation.

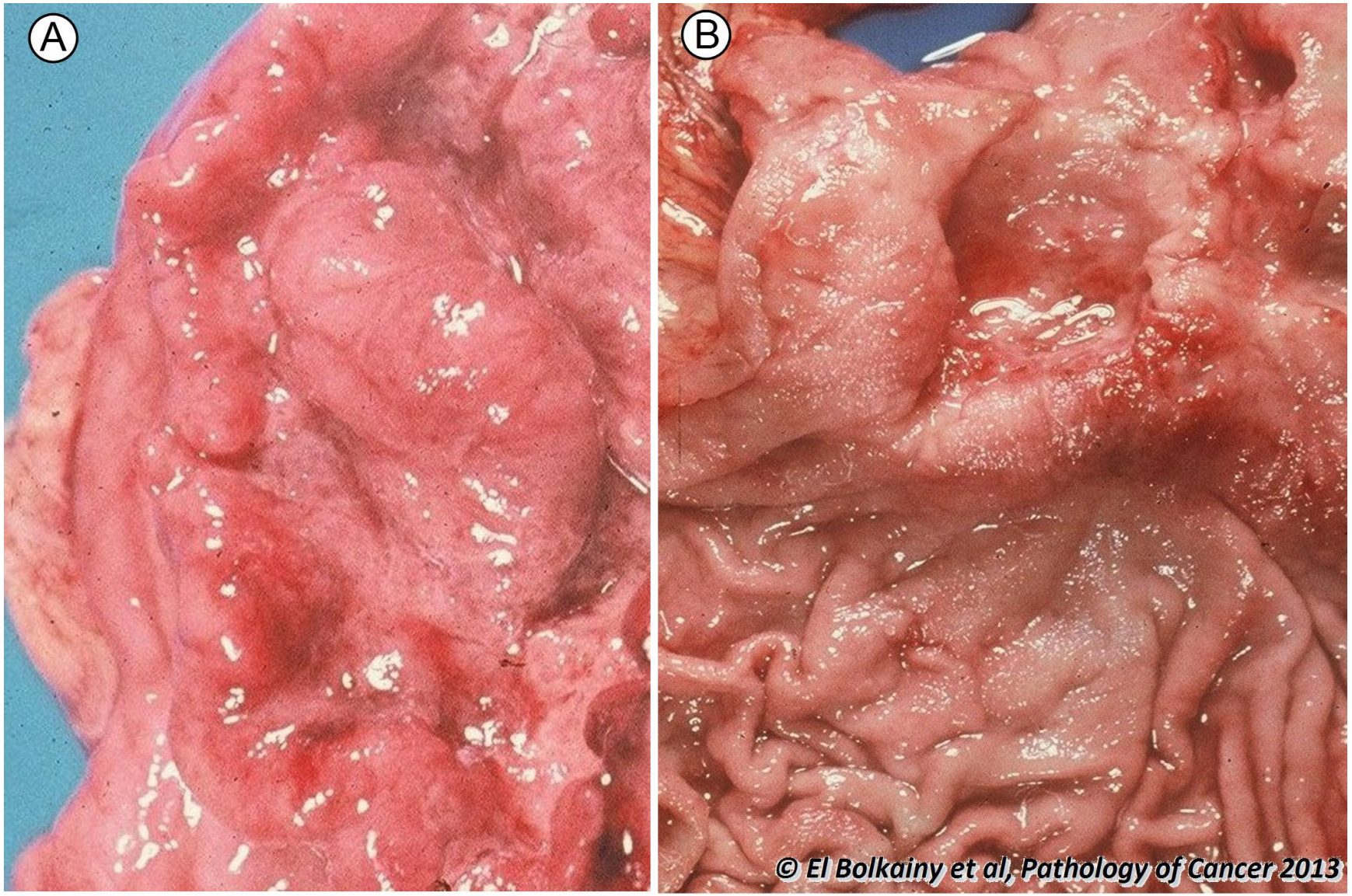
13.6 Stomach, intestinal metaplasia and dysplasia, histology.



Picture 13-6

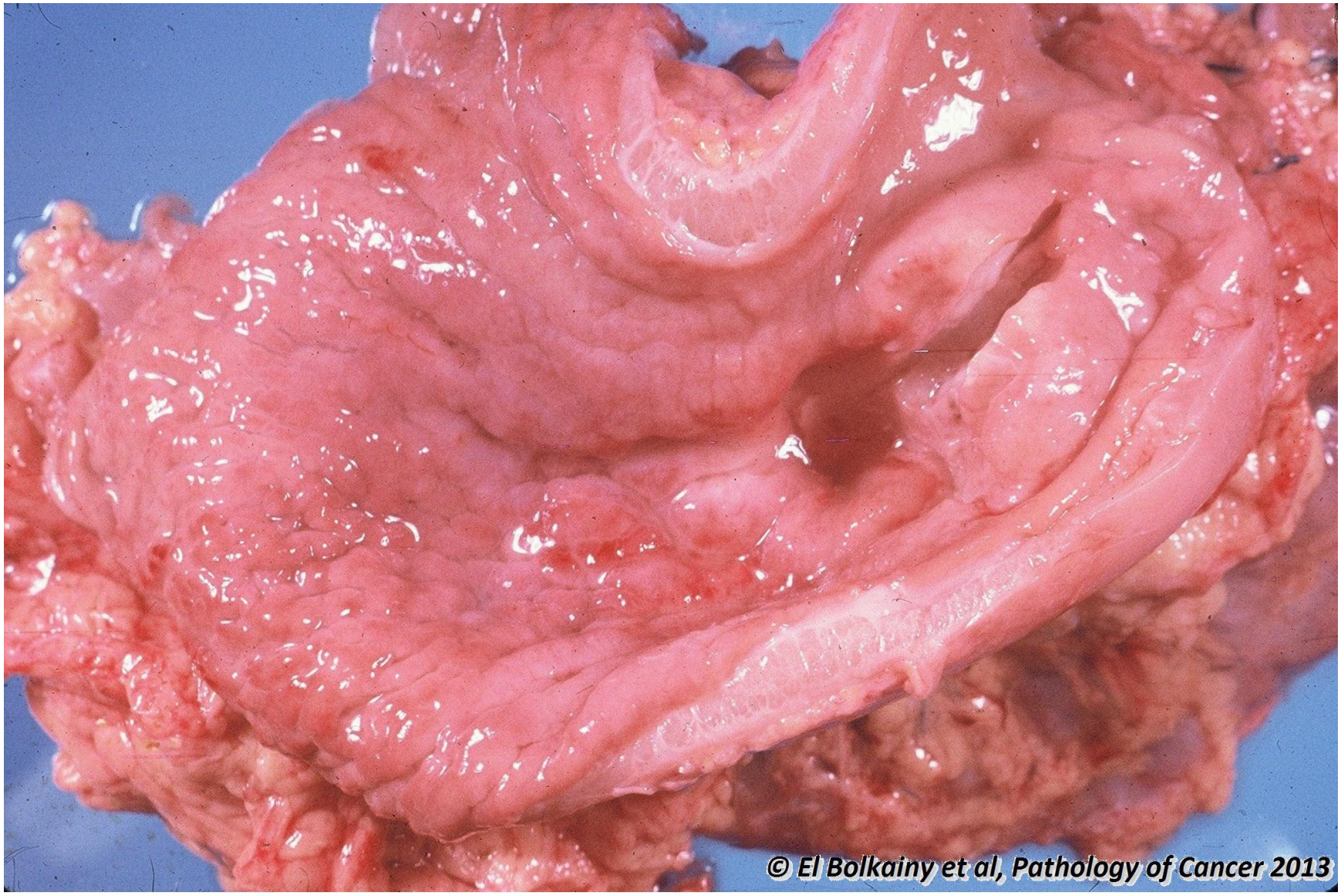
Stomach, intestinal metaplasia and dysplasia, histology. Metaplasia may be type I (goblet cells with enterocytes) or type II (goblet cells with gastric foveolar cells. Alcian blue stains goblet cells and PAS stains foveolar cells. Goblet cells are MUC2+ but foveolar glands are MUC5+. Dysplasia may be mild (nuclei occupy the basal one half of cytoplasm) or marked (nuclei are stratified and include the entire cytoplasm, with marked atypia and prominent nucleoli. **A** Low power. **B** and **C** High power.

13.7 Stomach, adenocarcinoma, ulcerative type, gross features.



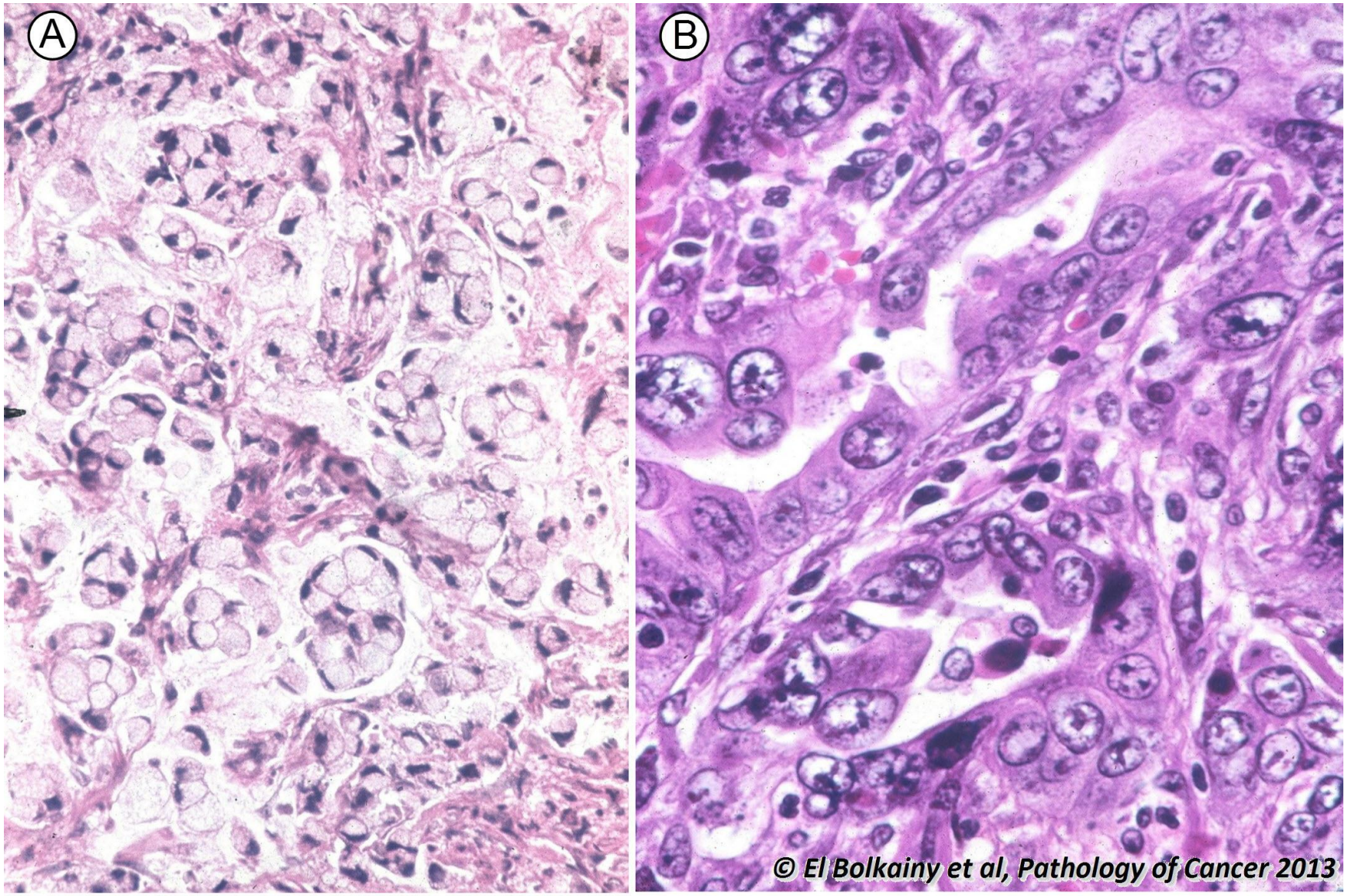
Picture 13-7 **Stomach, adenocarcinoma, ulcerative type, gross features. A** and **B** Note the malignant large ulcer with raised everted edge.

13.8 Stomach, adenocarcinoma, diffuse linitis plastica type, gross feature.



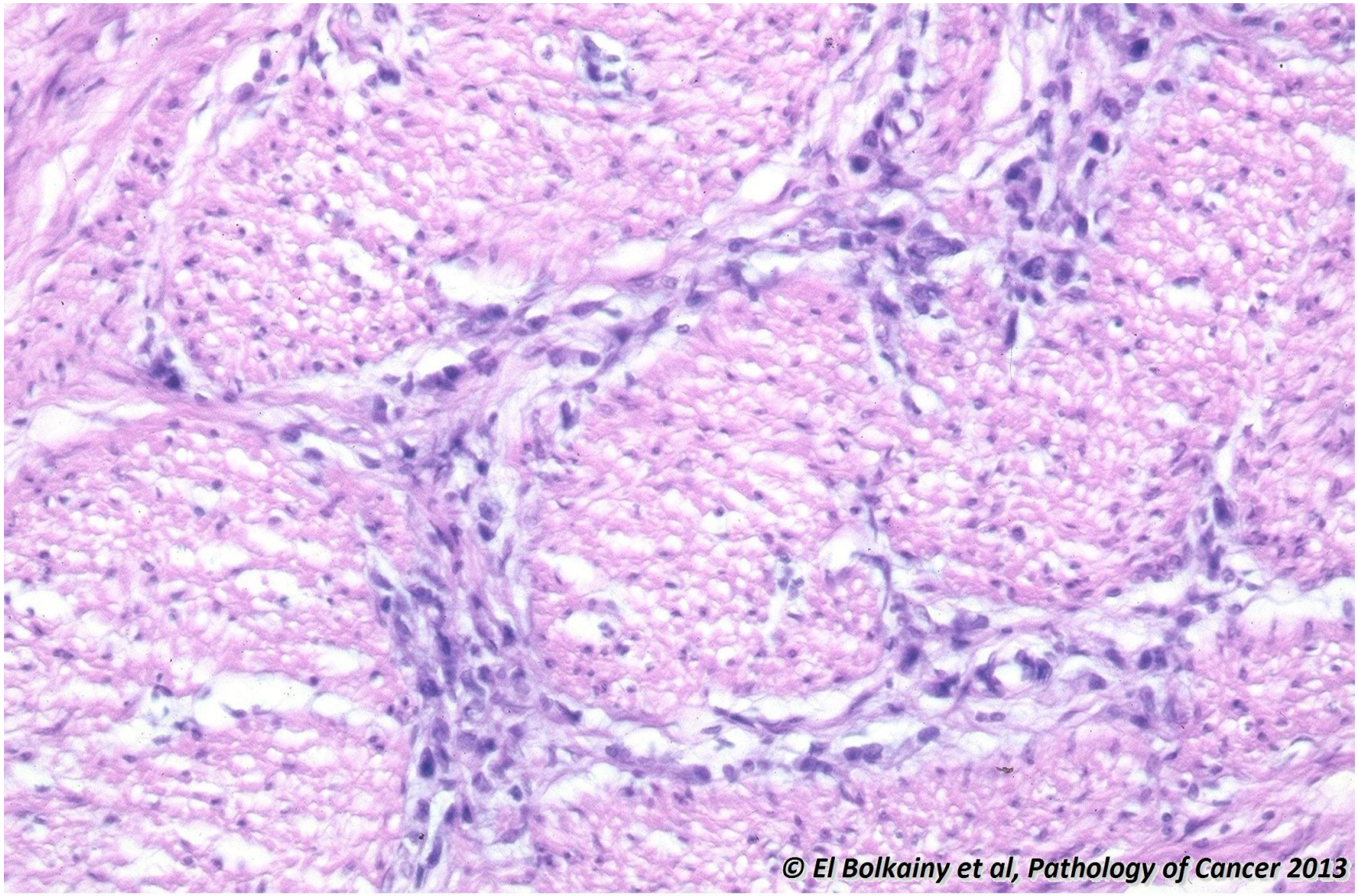
Picture 13-8 **Stomach, adenocarcinoma, diffuse linitis plastica type, gross feature.** There is diffuse thickening of gastric wall with some narrowing of the lumen (leather bottle stomach).

13.9 Stomach, adenocarcinoma, intestinal type of Lauren, histology.



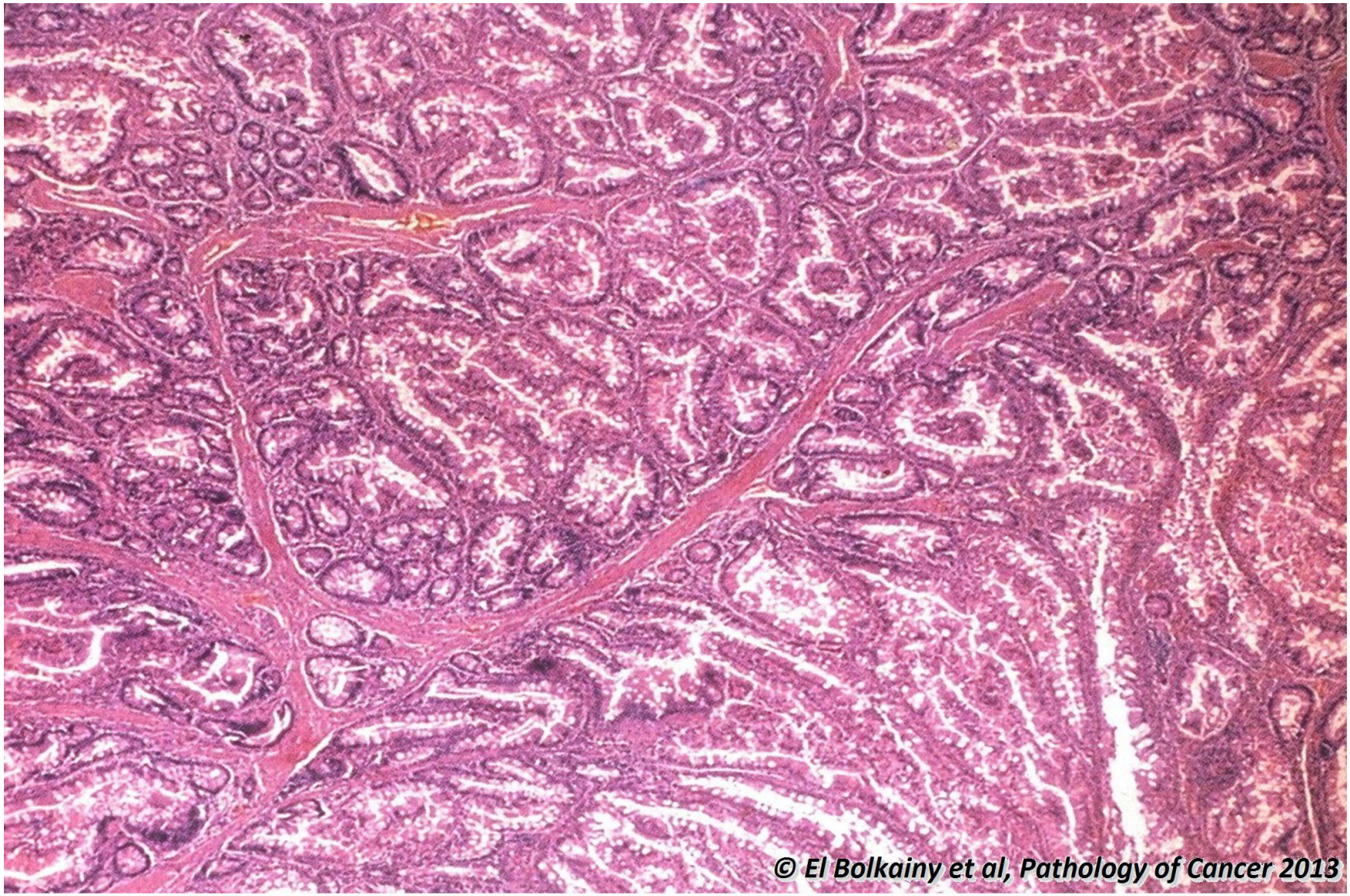
Picture 13-9 **Stomach, adenocarcinoma, intestinal type of Lauren, histology.** This may be **A** signet-ring type, **B** gland-forming or mucinous type.

13.10 Stomach, adenocarcinoma, diffuse type of Lauren, histology.



Picture 13-10 **Stomach, adenocarcinoma, diffuse type of Lauren, histology.** It is composed of small undifferentiated cells that diffusely infiltrate inbetween muscle bundles, simulating inflammatory cells, but they are CK+ and LCA-.

13.11 Small intestine, hamartomatous polyp of Peutz-Jeghers syndrome, histology.

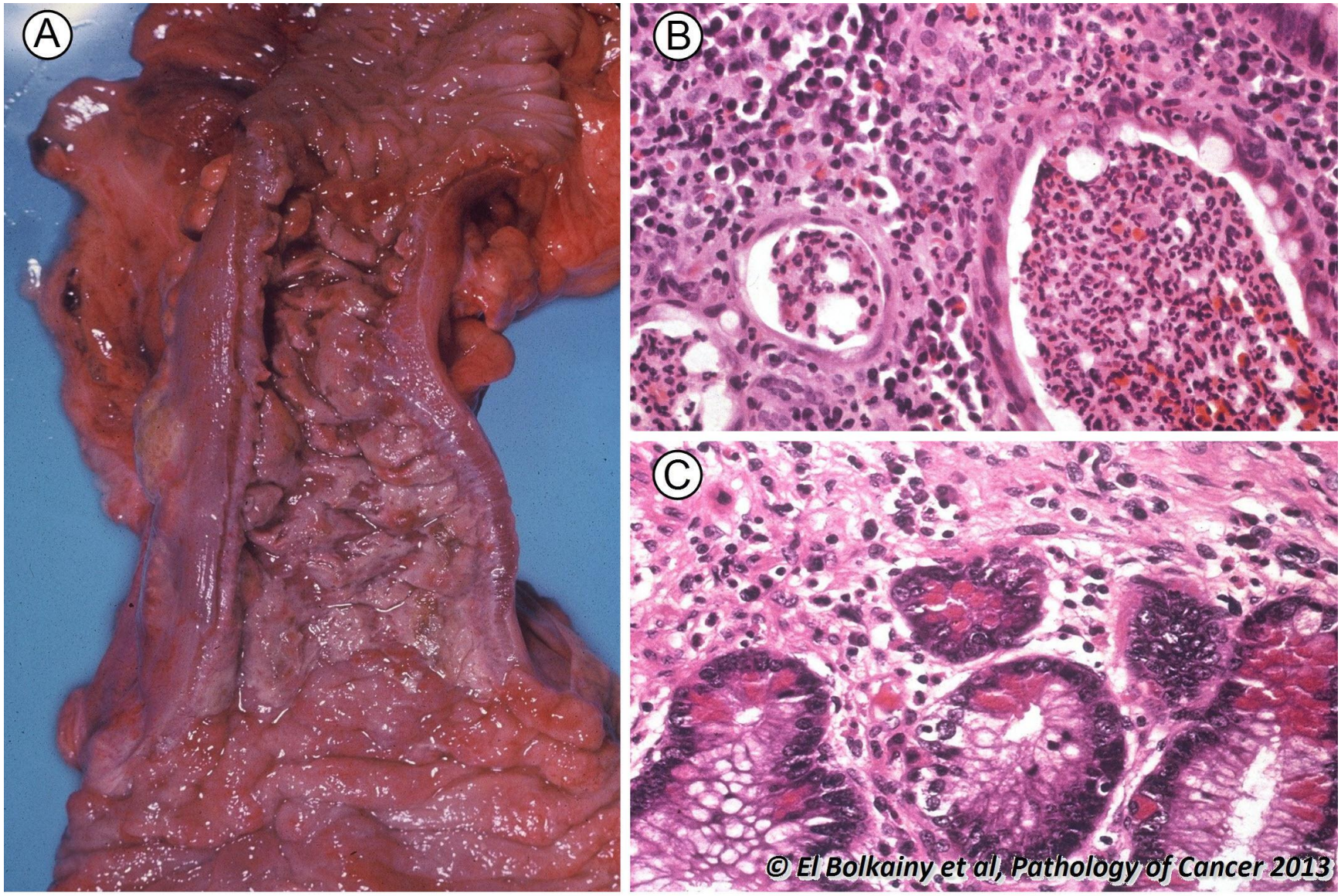


Picture 13-11 **Small intestine, hamartomatous polyp of Peutz-Jegher syndrome, histology.** It is composed of normal intestinal epithelium, associated smooth muscle component and dysplasia is absent. It is commonly found in small intestine: the polyp itself is not precancerous, but, the syndrome is associated with increased risk of malignancy in gastrointestinal mucosa (colon and stomach) independant of the polyps.

13.12 Rectum, solitary juvenile polyp, histology.

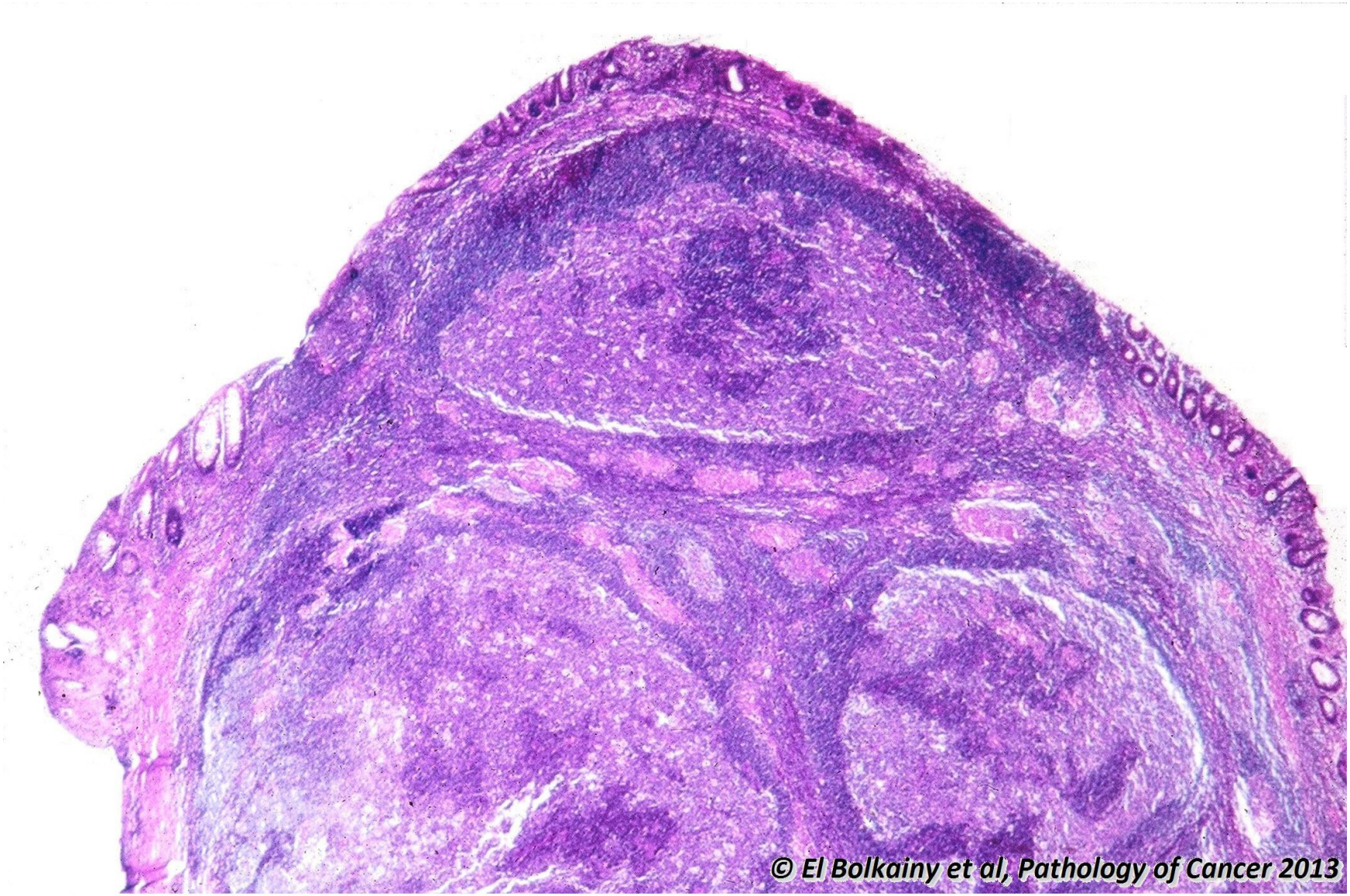
Picture 13-12 **Rectum, solitary juvenile polyp, histology.** This is an acquired retention polyp showing inflammation in the stroma, as well as, cystic glands. Solitary polyps are not precancerous, but, patients with multiple polyps (> 5cm) are at high-risk to develop gastrointestinal cancer.

13.13 Colon, inflammatory pseudopolyps of ulcerative colitis.



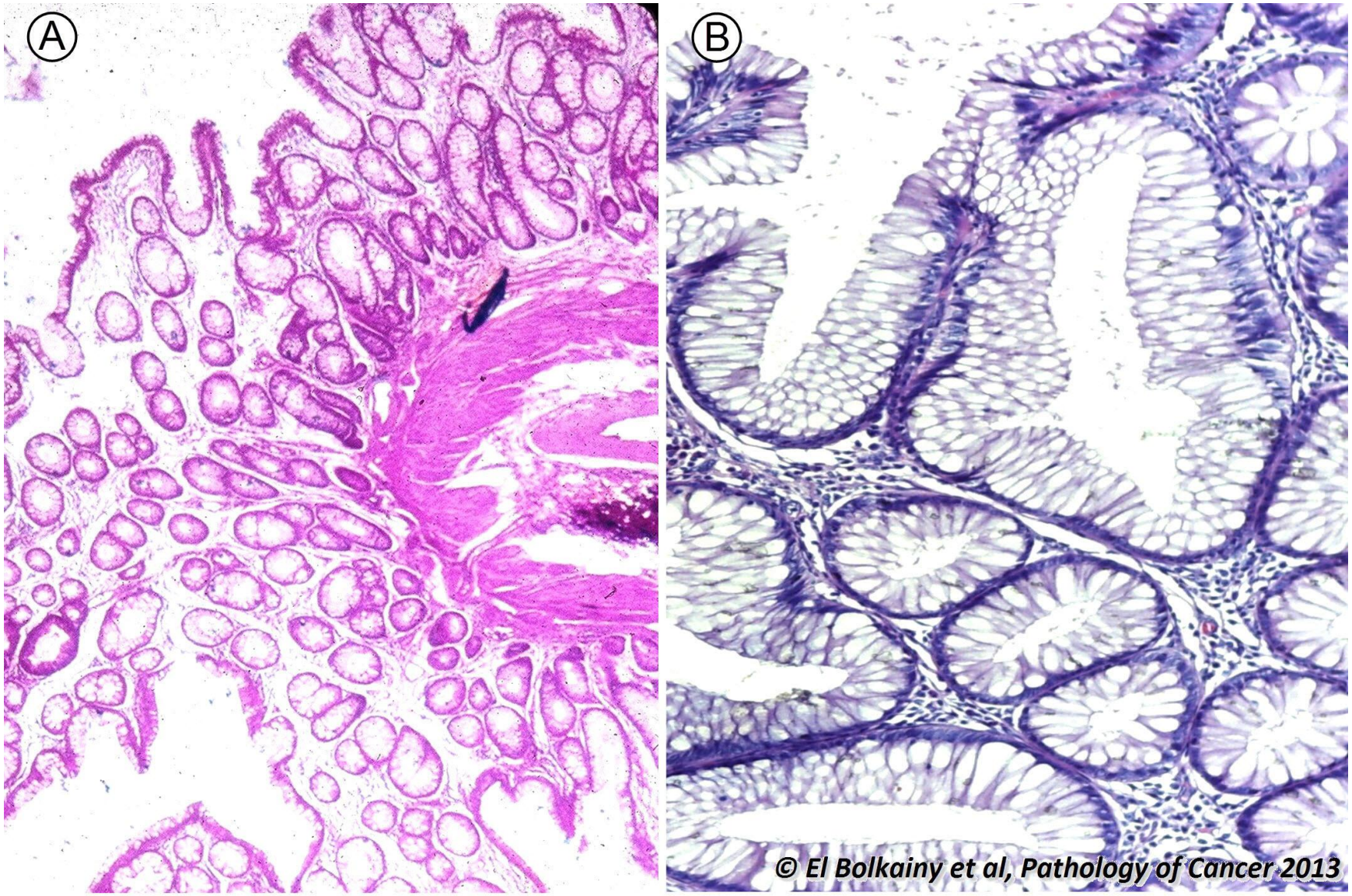
Picture 13-13 **Colon, inflammatory pseudopolyps of ulcerative colitis. A** Gross, reddish mucosa showing multiple ulcers with islands of regenerating mucosa (pseudopolyps). **B** and **C** Histology, dense mucosal inflammatory exudate distorting the glands, crypt abscess and goblet cell depletion. In mild dysplasia the nuclei occupy the basal half of cytoplasm, but, in marked dysplasia, nuclear stratification reaching luminal border of cytoplasm and cribriform pattern are evident.

13.14 Rectum, lymphoid polyp, histology.



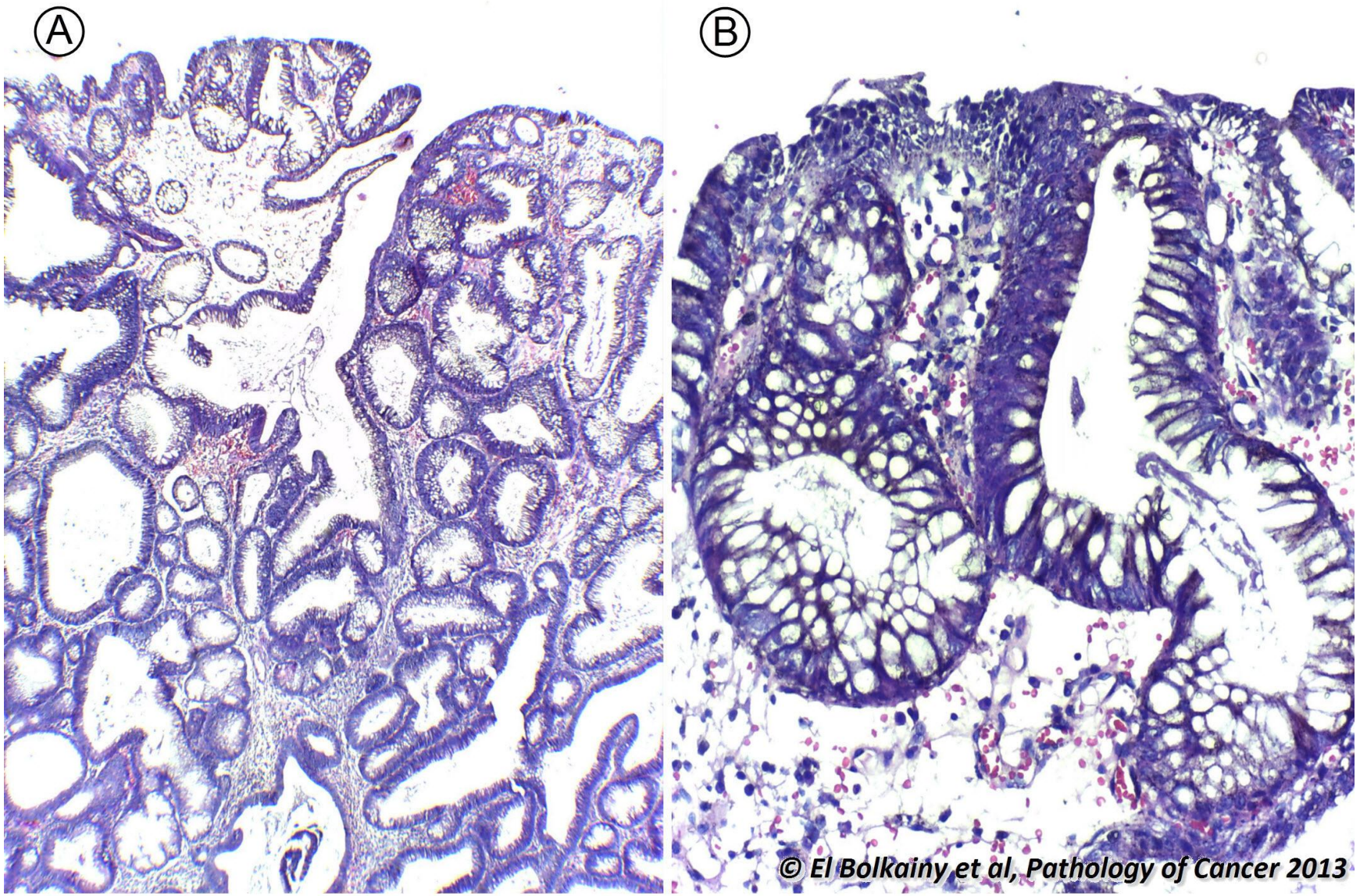
Picture 13-14 **Rectum, lymphoid polyp, histology.** Reactive lymphoid tissue with germinal centers is evident in mucosa covered by intact surface epithelium.

13.15 Colon, hyperplastic polyp.



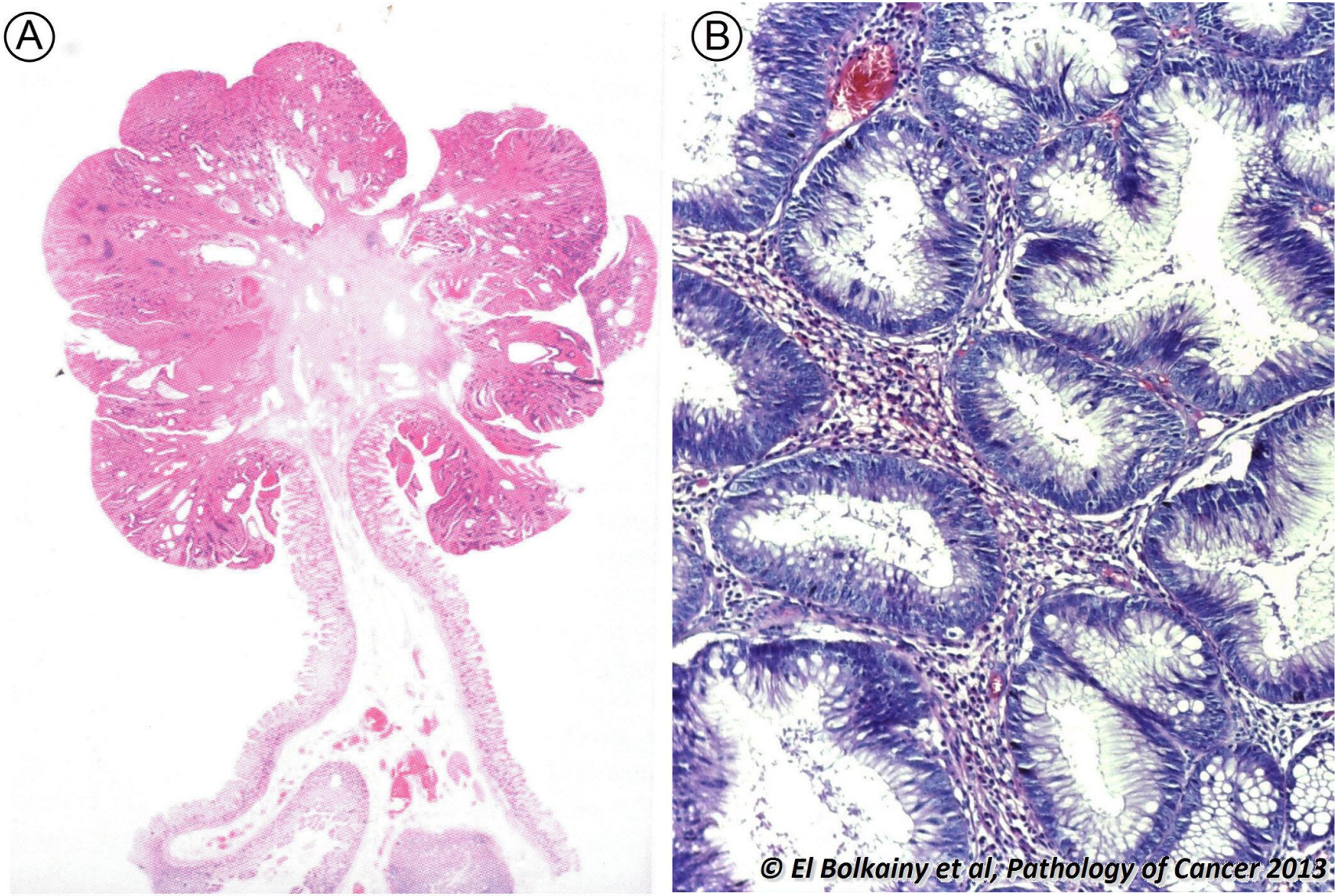
Picture 13-15 **Colon, hyperplastic polyp. A common colonic polyp, usually located in Lt. colon. A** and **B** Small size and sessile , the glands are lined by non-dysplastic goblet cells with evidence of elongated crypts.

13.16 Rt. colon, sessile serrated adenoma/polyp (SSA/P), histology.



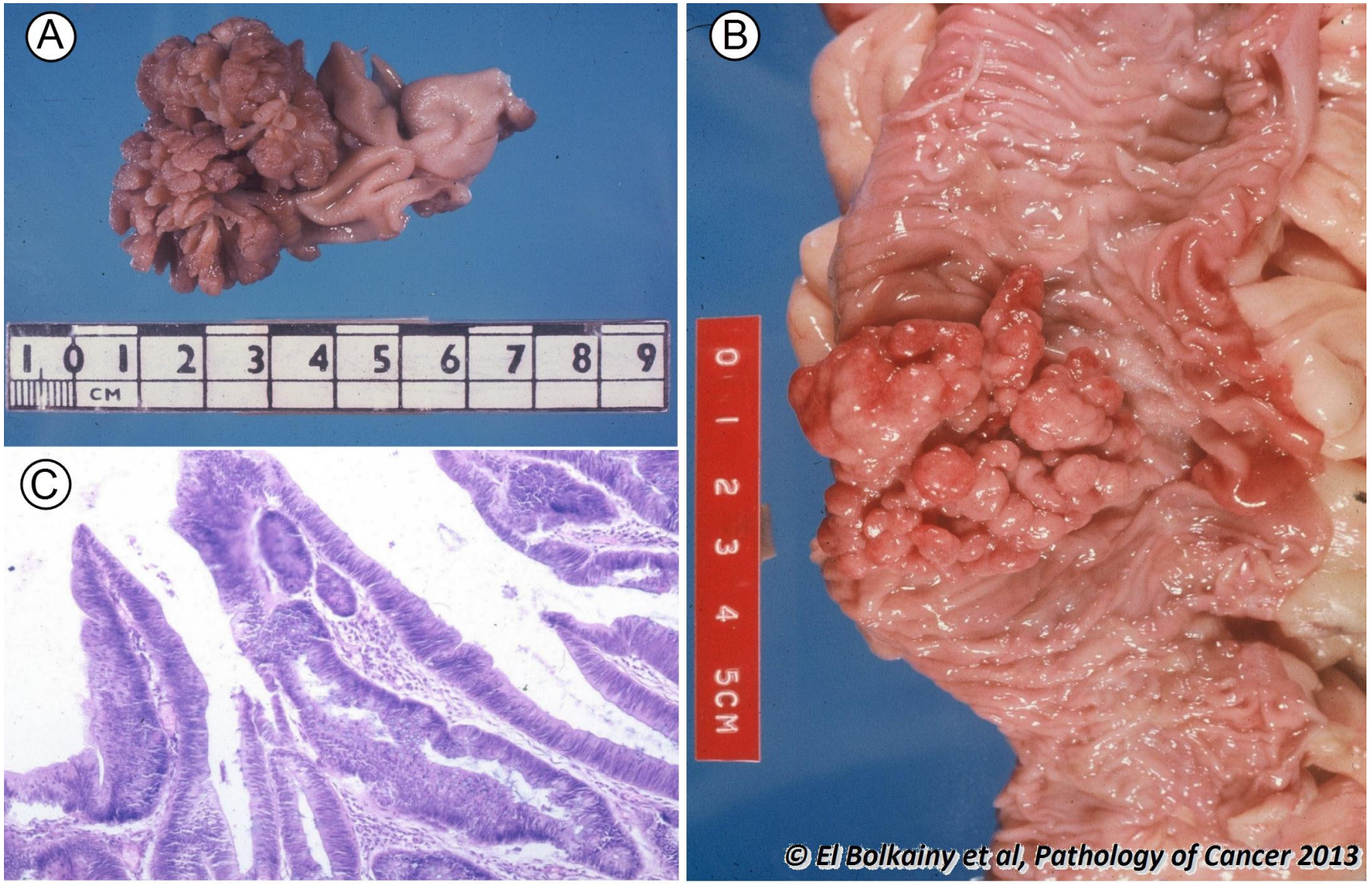
Picture 13-16 **Rt. colon, sessile serrated adenoma/polyp (SSA/P), histology. A** and **B** Common in Rt. colon. Marked serrated pattern of surface and glands with dilatation of crypts (inverted T or anchor-shaped pattern). These adenomas are precancerous, hence, polyps > 5 mm should be excised.

13.17 Colon, adenomatous polyp (adenoma), histology.



Picture 13-17 **Colon, adenomatous polyp (adenoma), histology. A** Low power, pedunculated polyp with long pedicle. **B** High power, there is depletion of goblet cells and the epithelium is always dysplastic and carcinoma develops in the polyp itself.

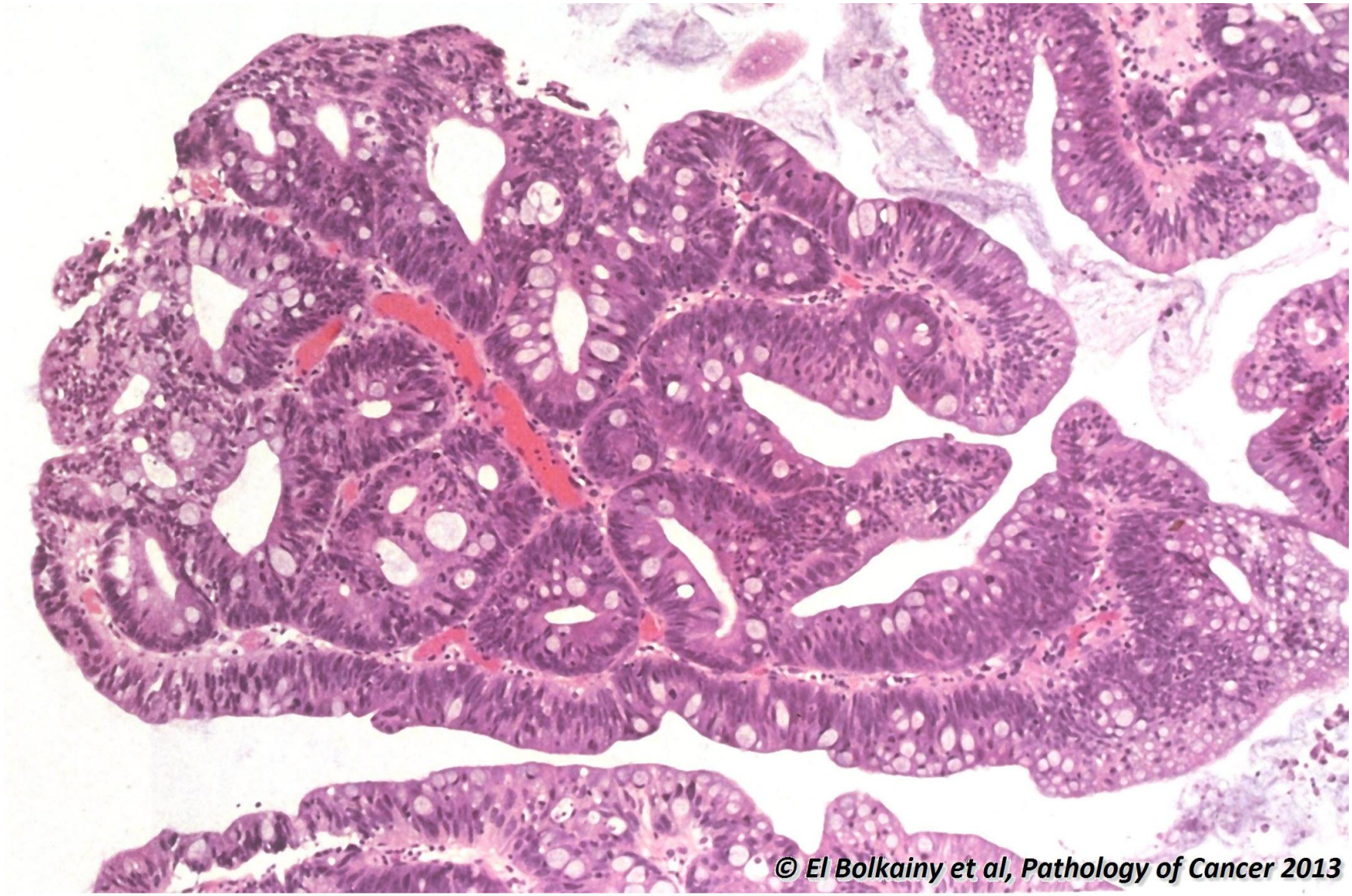
13.18 Sigmoid, villous adenoma.



Picture 13-18

Sigmoid, villous adenoma. This is a high risk polyp, about 30% are associated with invasive carcinoma and 40% progress to malignancy. **A** Gross, a pedunculated polypoid pedunculated growth. **B** Histology, a prominent villous pattern is evident at surface. **C** Gross, a sessile filamentous growth, the nodule in the upper left part of adenoma proved to be malignant.

13.19 Colon, carcinoma in adenomatous polyp, histology.

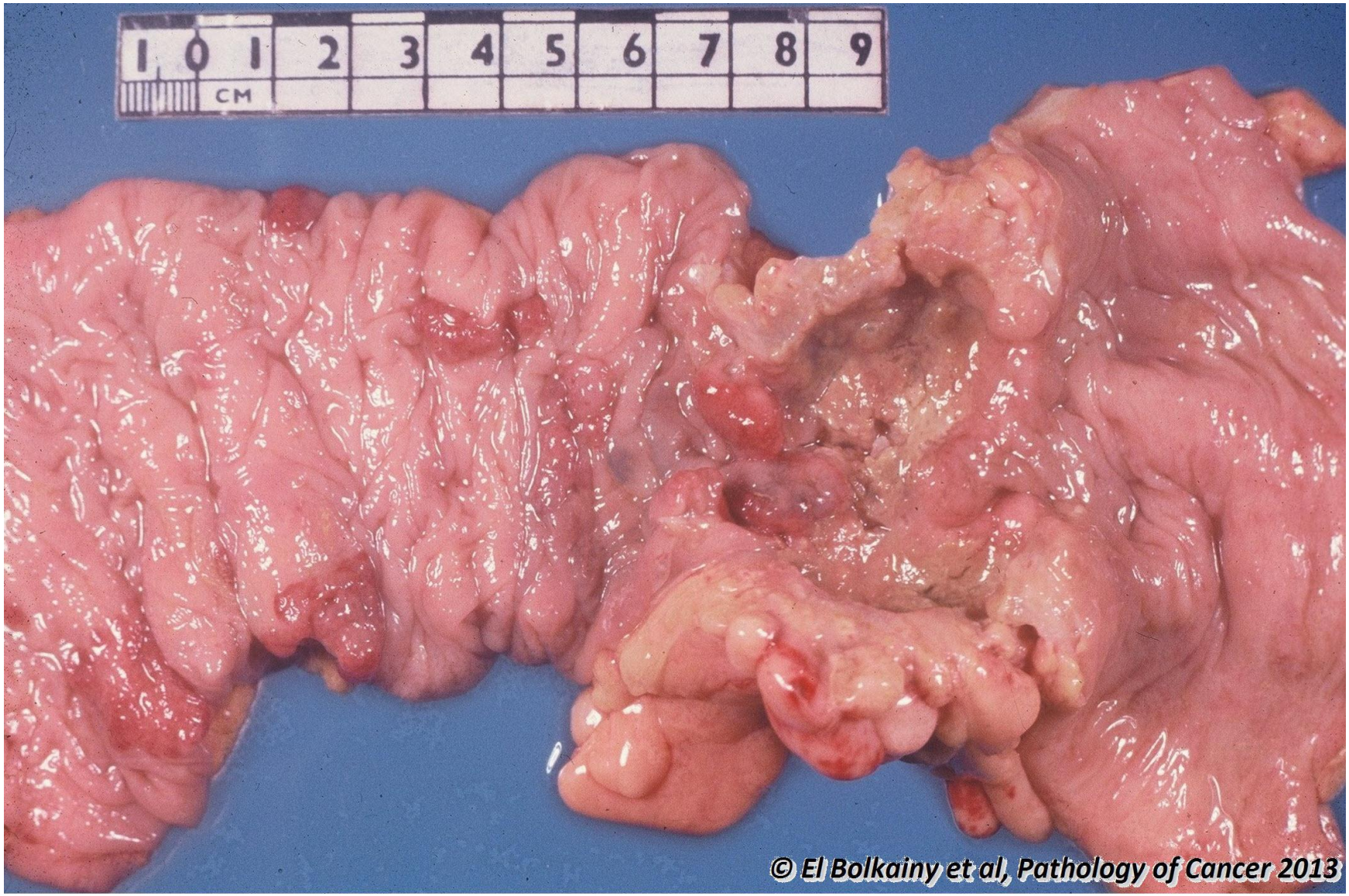


Picture 13-19 **Colon, carcinoma in adenomatous polyp, histology.** This type I tumor, the malignant glands are confined to mucosa and the pedicle is not invaded, hence, polypectomy is sufficient. Type II carcinoma invading the lymphatic-rich submucosa should be treated by colectomy.

13.20 Colon, familial adenomatous polyposis (FAP), gross features.

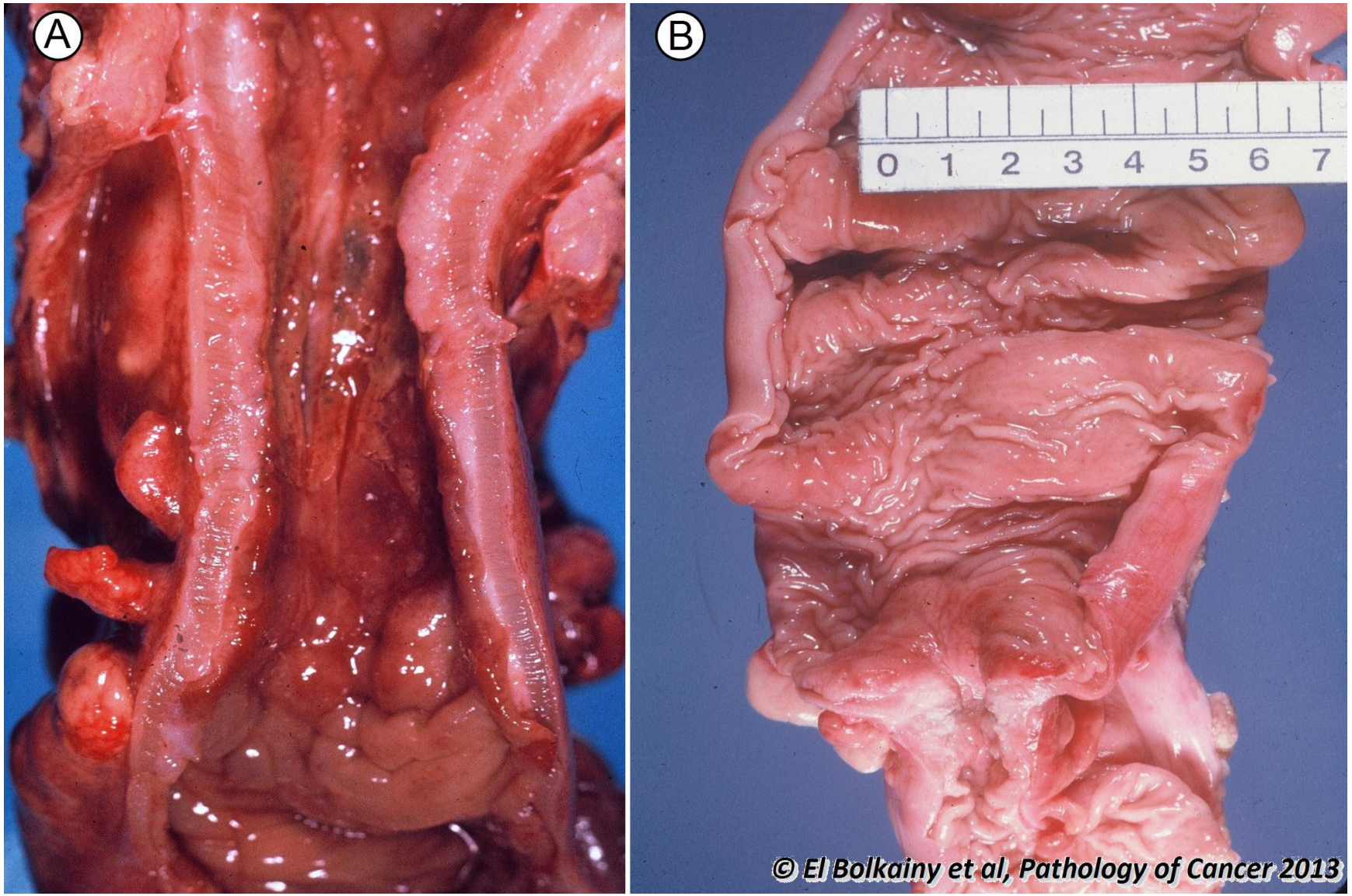
Picture 13-20 **Colon, familial adenomatous polyposis (FAP), gross features.** Numerous small polyps (>100) are evident. These are very high-risk polyps and 100% of patients will develop colonic cancer by the age of 40, hence, total colectomy is advisable by the age of 30 years.

13.21 Colon, adenocarcinoma, ulcerative type, gross features.



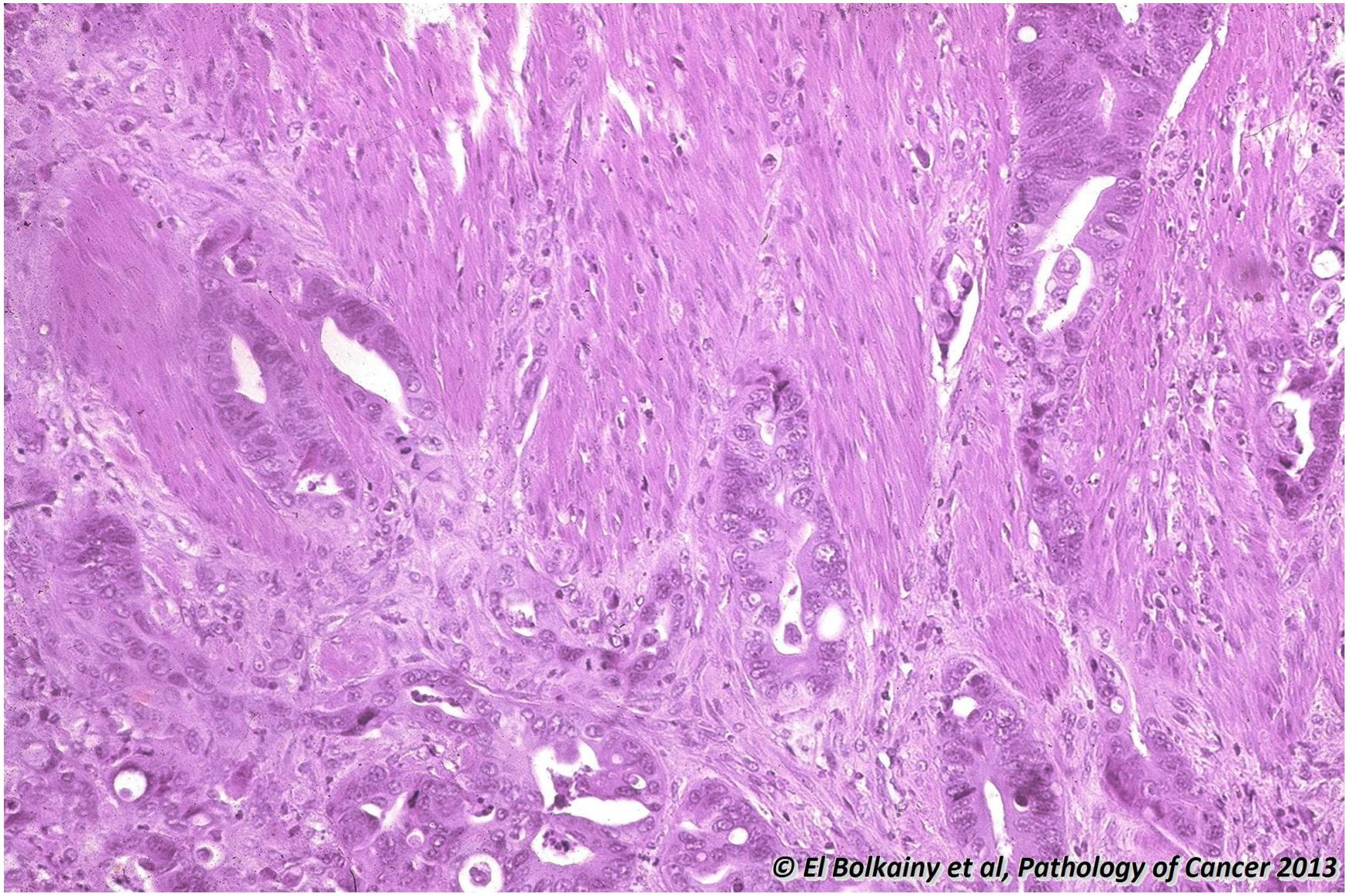
Picture 13-21 **Colon, adenocarcinoma, ulcerative type, gross features.** A large malignant ulcer of colon with raised everted edge.

13.22 Colon, adenocarcinoma, stricture type, gross features.



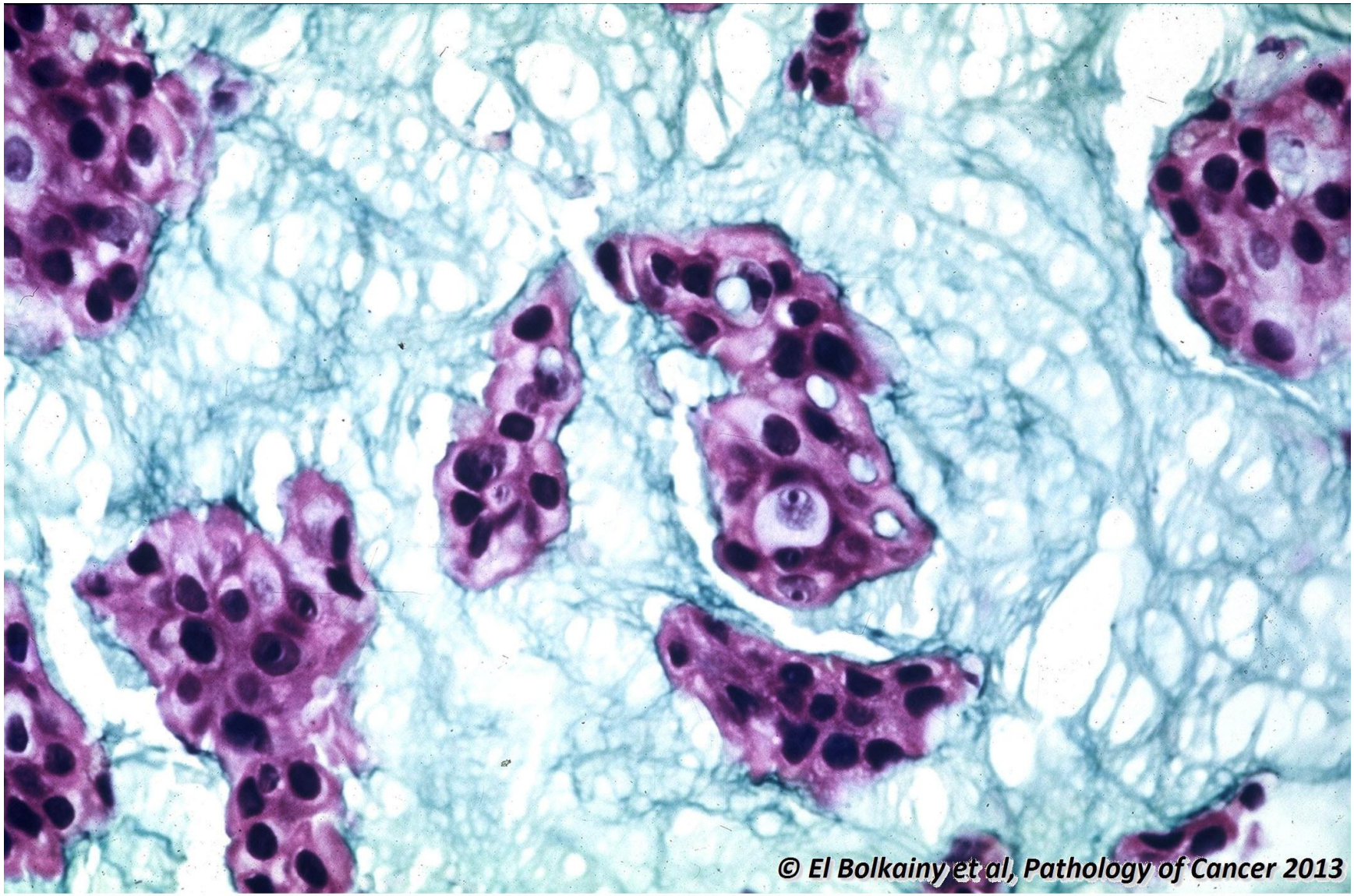
Picture 13-22 **Colon, adenocarcinoma, stricture type, gross features. A** A long annular stricture of colon with thickening of wall. **B** A short malignant stricture obstructing the lumen with proximal dilatation of the colon.

13.23 Colon, gland-forming adenocarcinoma, histology.



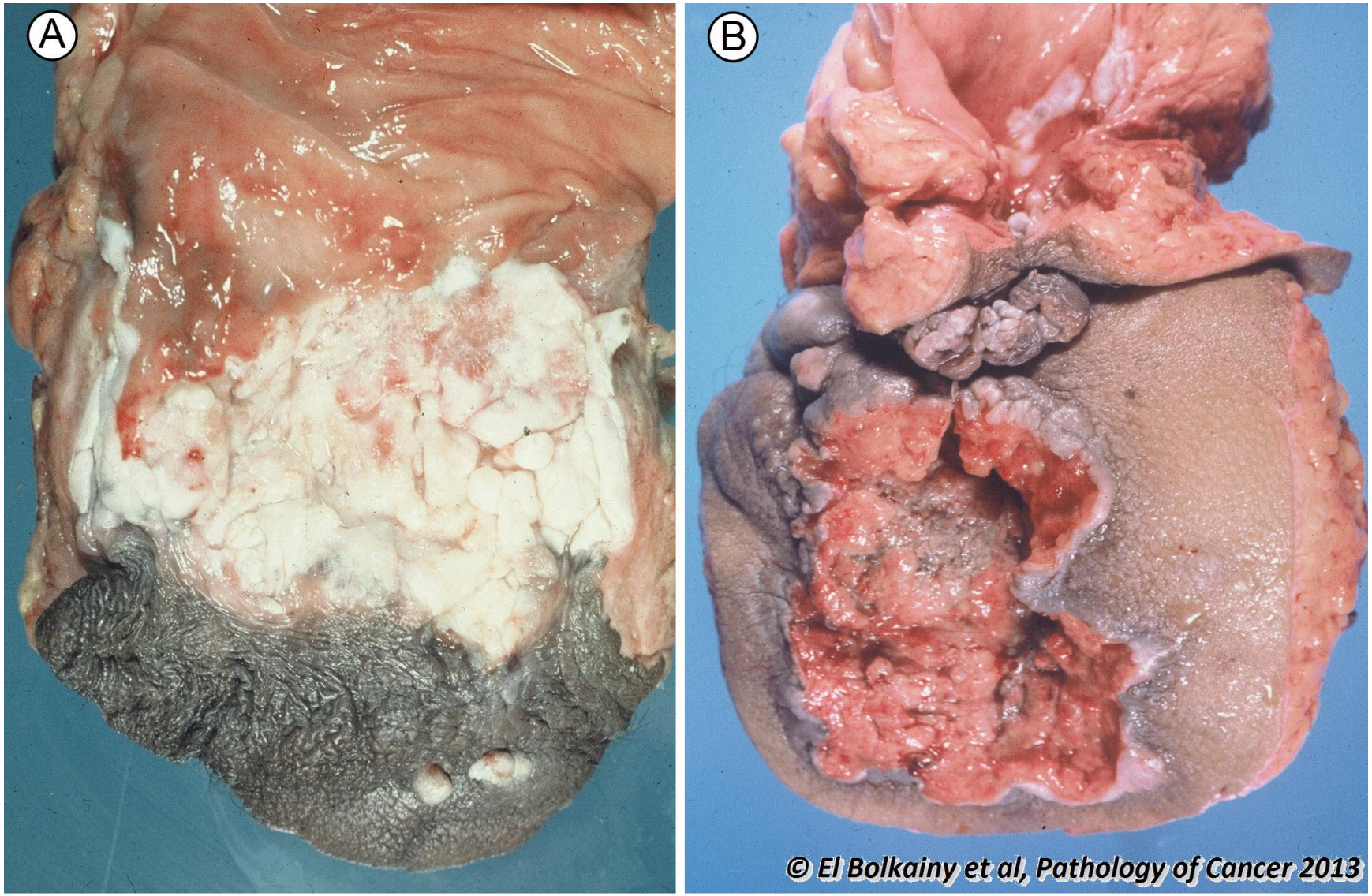
Picture 13-23 **Colon, gland-forming adenocarcinoma, histology.** Irregular glands of variable size and shape invading the muscle layer of colon.

13.24 Colon, mucinous adenocarcinoma, histology. Alcian blue stain.



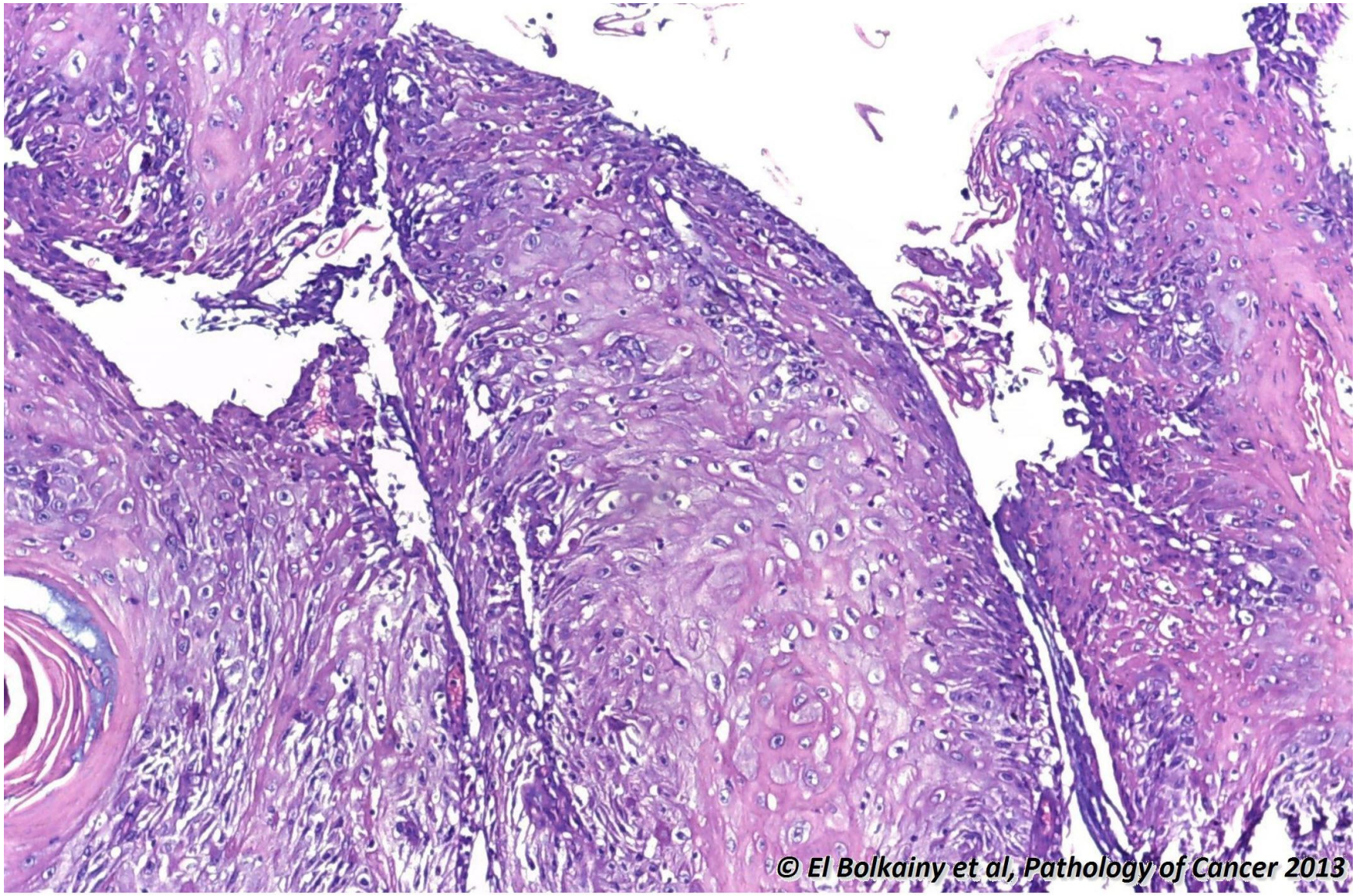
Picture 13-24 **Colon, mucinous adenocarcinoma, histology. Alcian blue stain.** Small islands of malignant glands in a pool of extracellular mucin (alcian blue positive). This histologic type is commonly observed in Rt. colon (Lynch syndrome, with loss of DNA repair genes MLH1 and MSH2 negative).

13.25 Anal canal, squamous cell carcinoma, gross features.



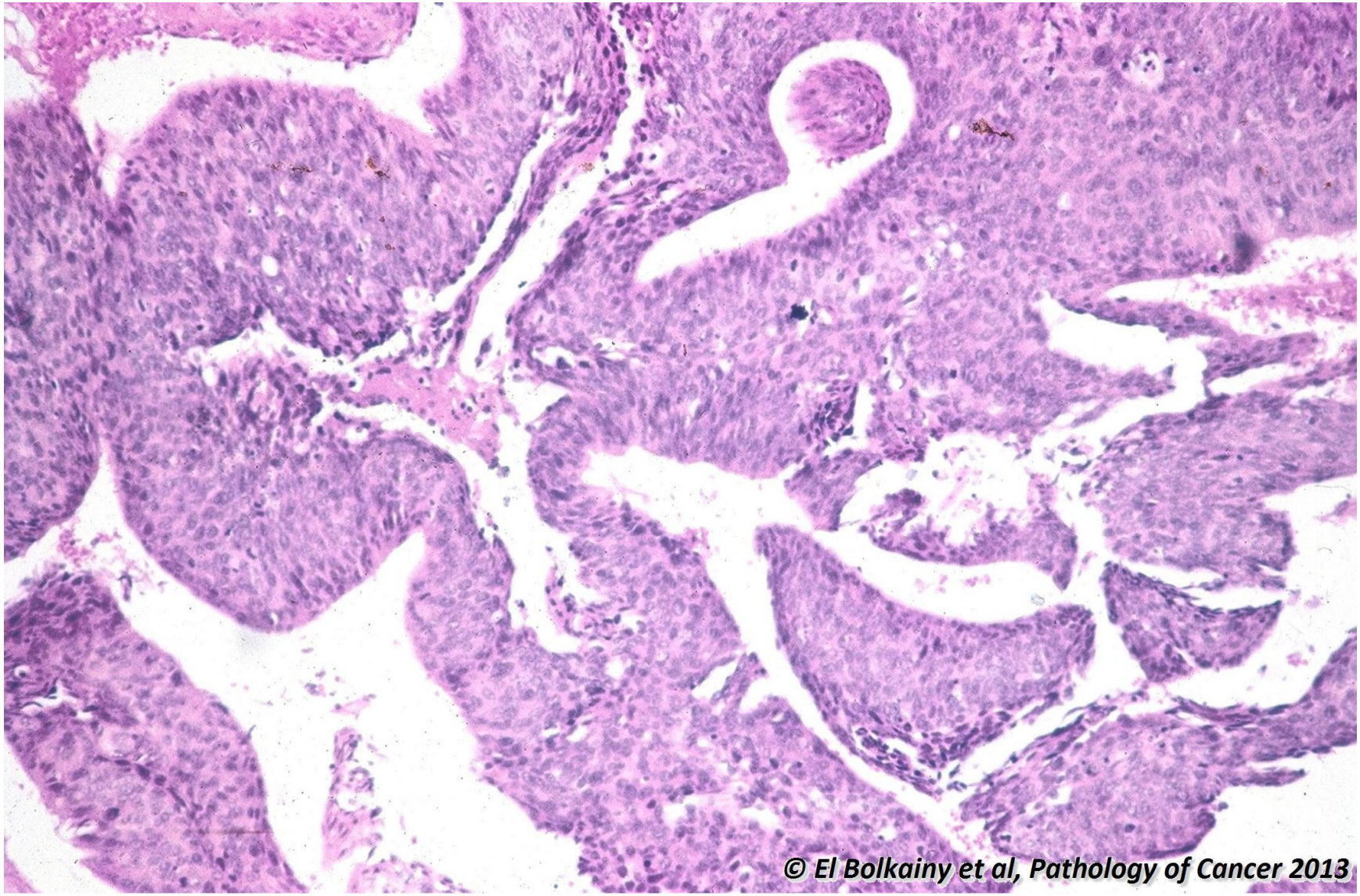
Picture 13-25 **Anal canal, squamous cell carcinoma, gross features. A** Extensive leukoplakia associated with invasive squamous carcinoma. **B** Squamous cell carcinoma of anal canal, ulcerative type. Note the raised everted edge of the ulcer and invasion of perianal skin.

13.26 Anal canal invasive squamous cell carcinoma, histology.



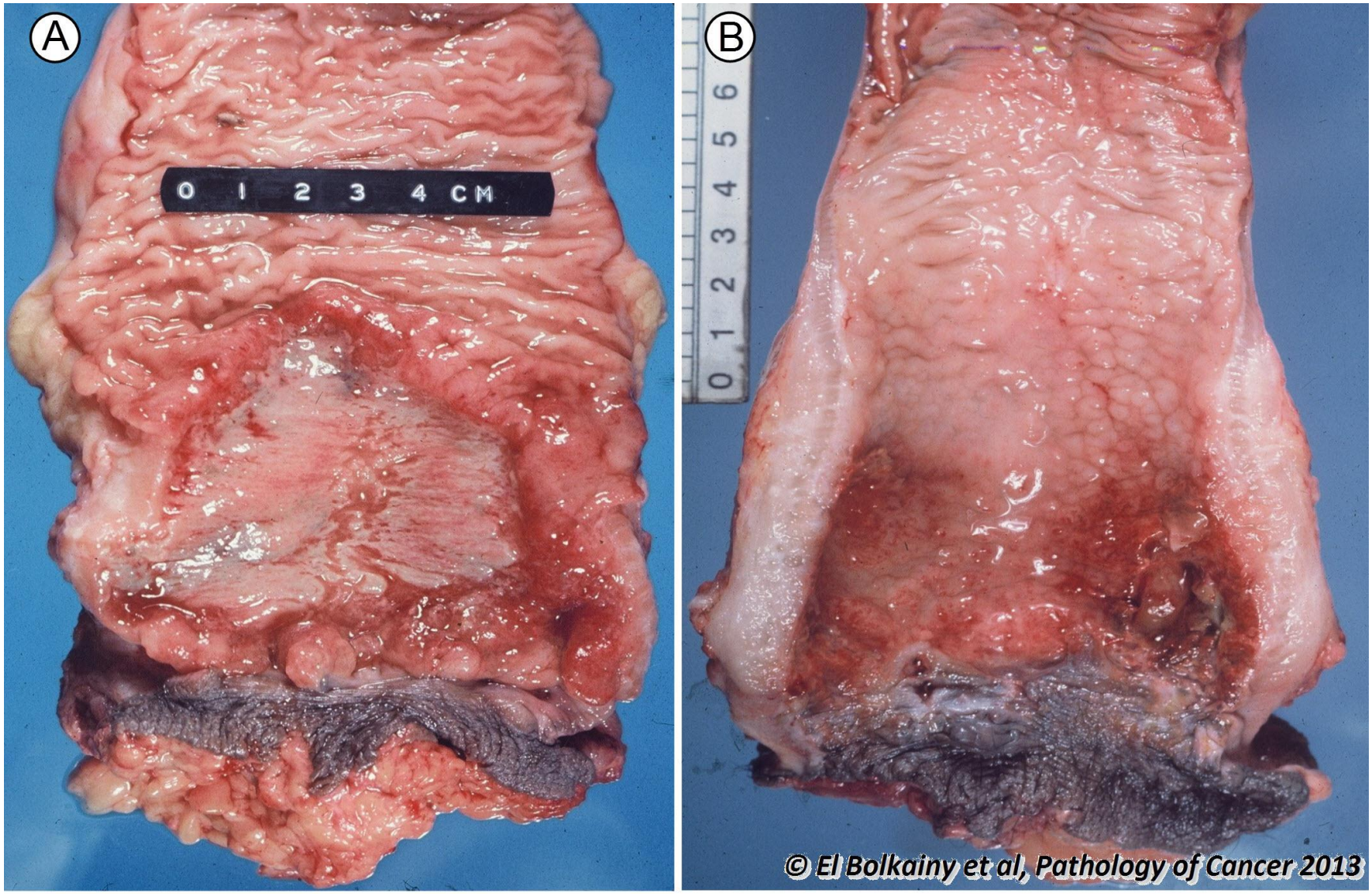
Picture 13-26 **Anal canal invasive squamous cell carcinoma, histology.** The carcinoma exhibits squamous differentiation, invasion of stroma and moderate anaplasia (grade 2).

13.27 Anal canal, basaloid carcinoma (so-called cloacogenic carcinoma), histology.



Picture 13-27 **Anal canal, basaloid carcinoma (so-called cloagenic carcinoma), histology.** Islands of undifferentiated cells with peripheral palisading and retraction artifacts. This high grade carcinoma arises from transition zone epithelium. It differs from neuroendocrine tumors in being chromogranin negative.

13.28 Adenocarcinoma of anal canal, gross features.

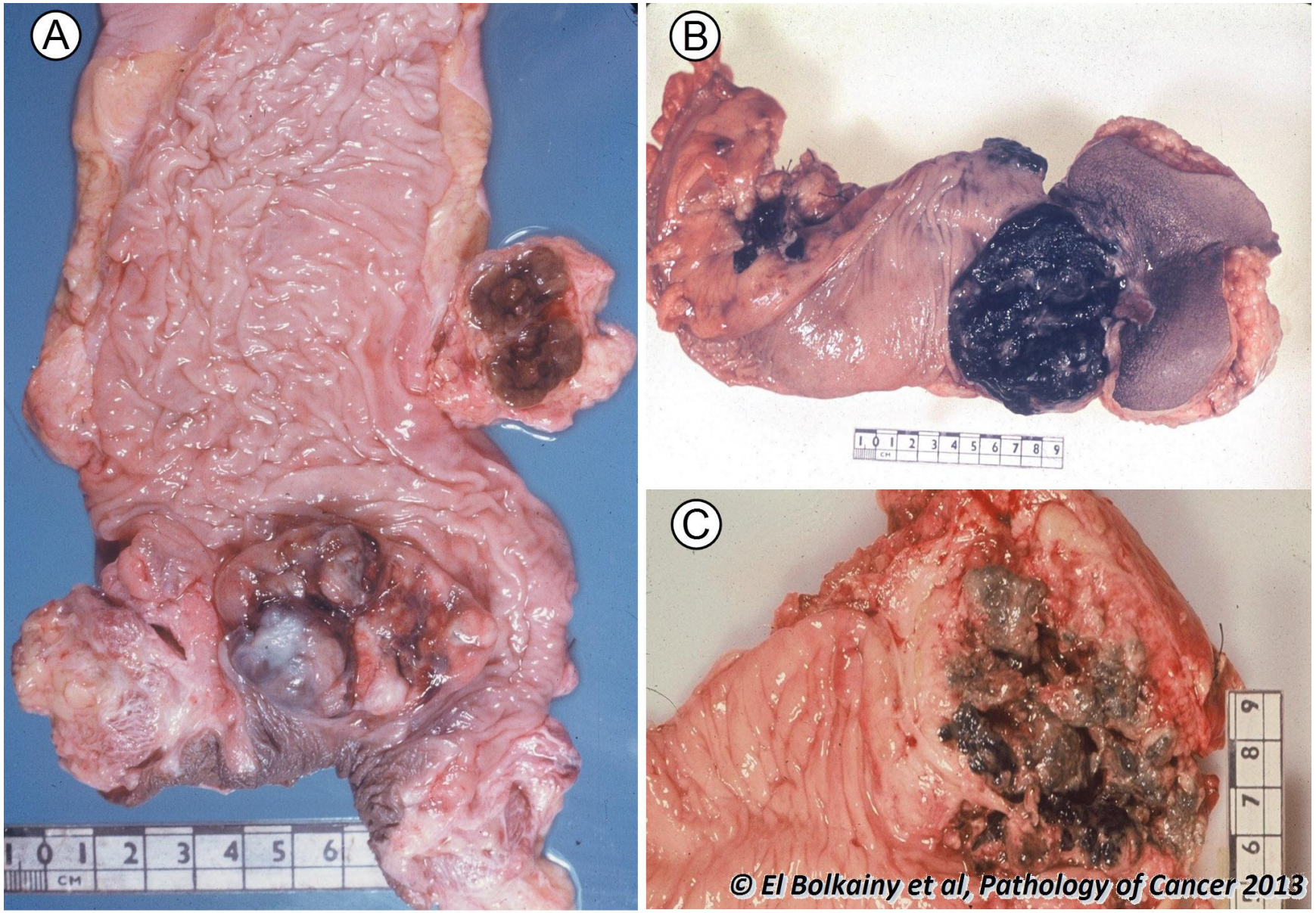


Picture 13-28 **Adenocarcinoma of anal canal, gross features. A** Malignant ulcer, large size with raised everted edge. **B** Diffuse type, showing diffuse infiltration and thickening of the wall of anal canal.

13.29 Anal canal, Paget disease, histology.

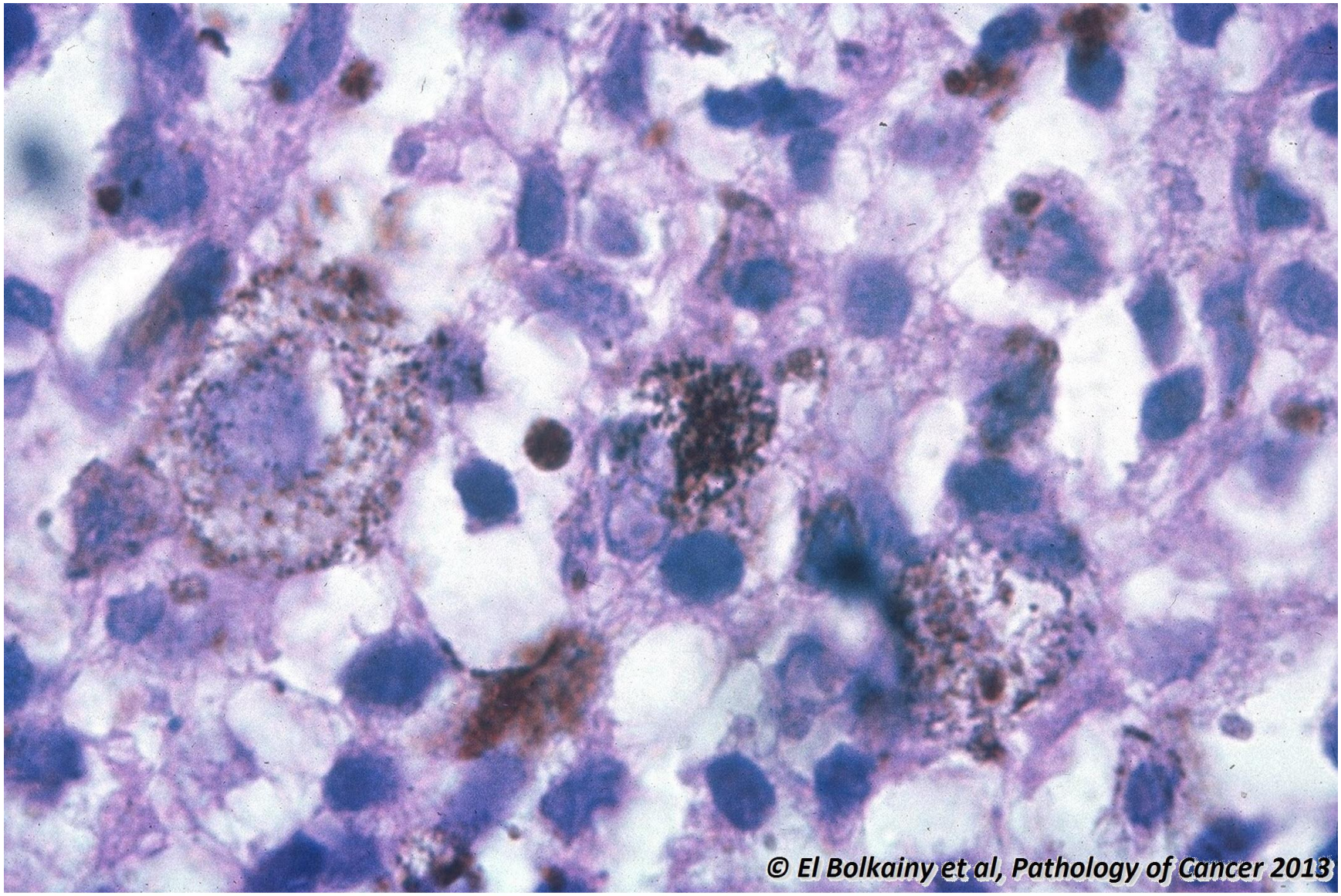
Picture 13-29 **Anal canal, Paget disease, histology.** The squamous surface epithelium is infiltrated by scattered large malignant cells with clear cytoplasm (positive for alcian blue, PAS and CEA). The primary tumor may be of apocrine glands (CK7+) or colorectal (CK20+) origin.

13.30 Anal canal, malignant melanoma, gross features.



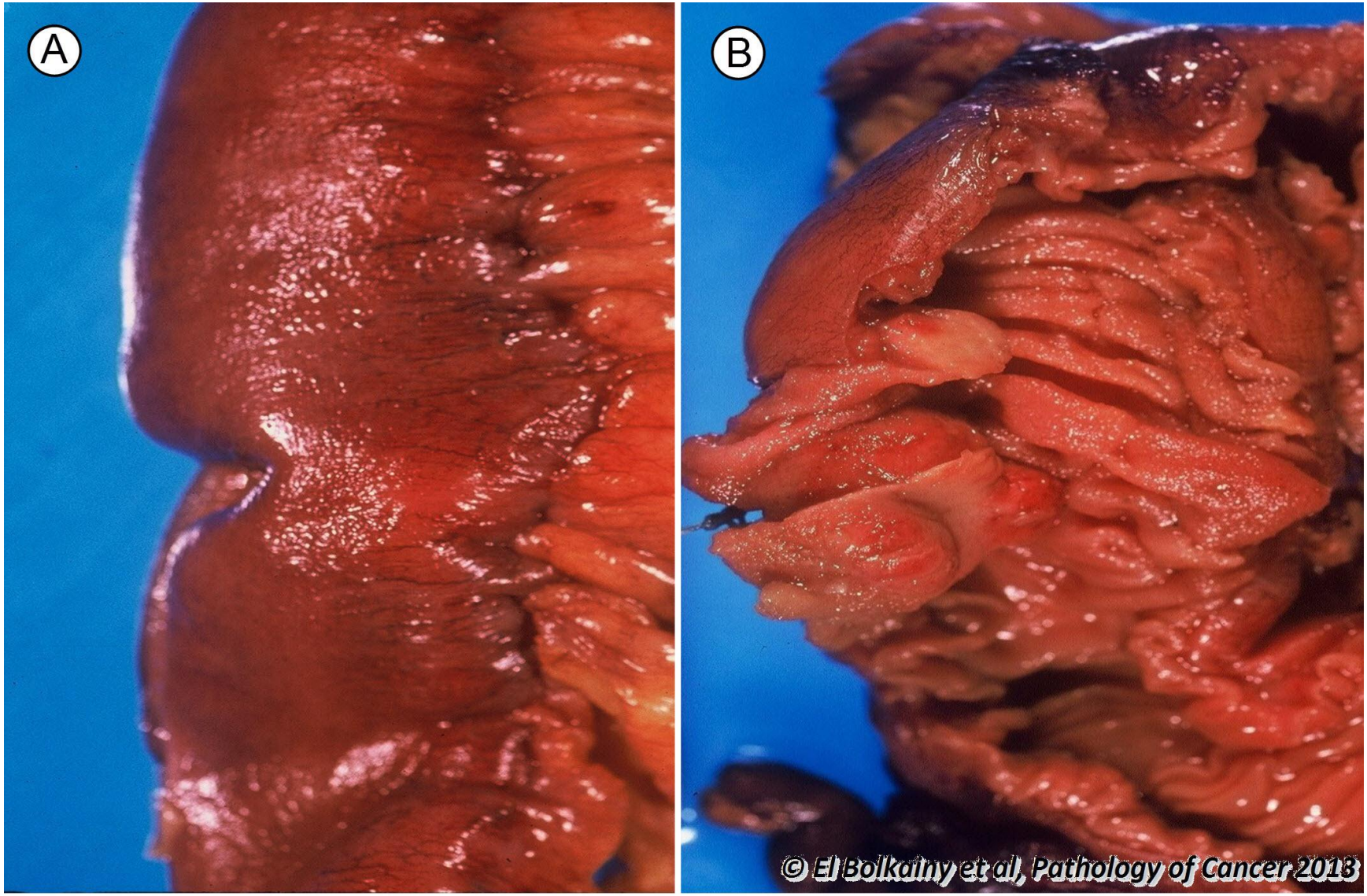
Picture 13-30 **Anal canal, malignant melanoma, gross features. A** Melanoma of anal canal with metastases in a regional lymph node. **B** Melanoma, ulcerating nodule of black color. **C** Melanoma, ulcerative type.

13.31 Anal canal, melanoma, histology.



Picture 13-31 **Anal canal, melanoma, histology.** Spindle and oval cells with dissociated pattern. Brownish pigment in cytoplasm. Immunostains: positive for S-100, HMB-45 and Melan-A, but, negative for Ck, CEA as well as mucin. In melanosis coli, the pigment is lipofuscin (positive for PAS, negative for prussion blue and S-100).

13.32 Ileum, neuroendocrine tumor (carcinoid), gross features.

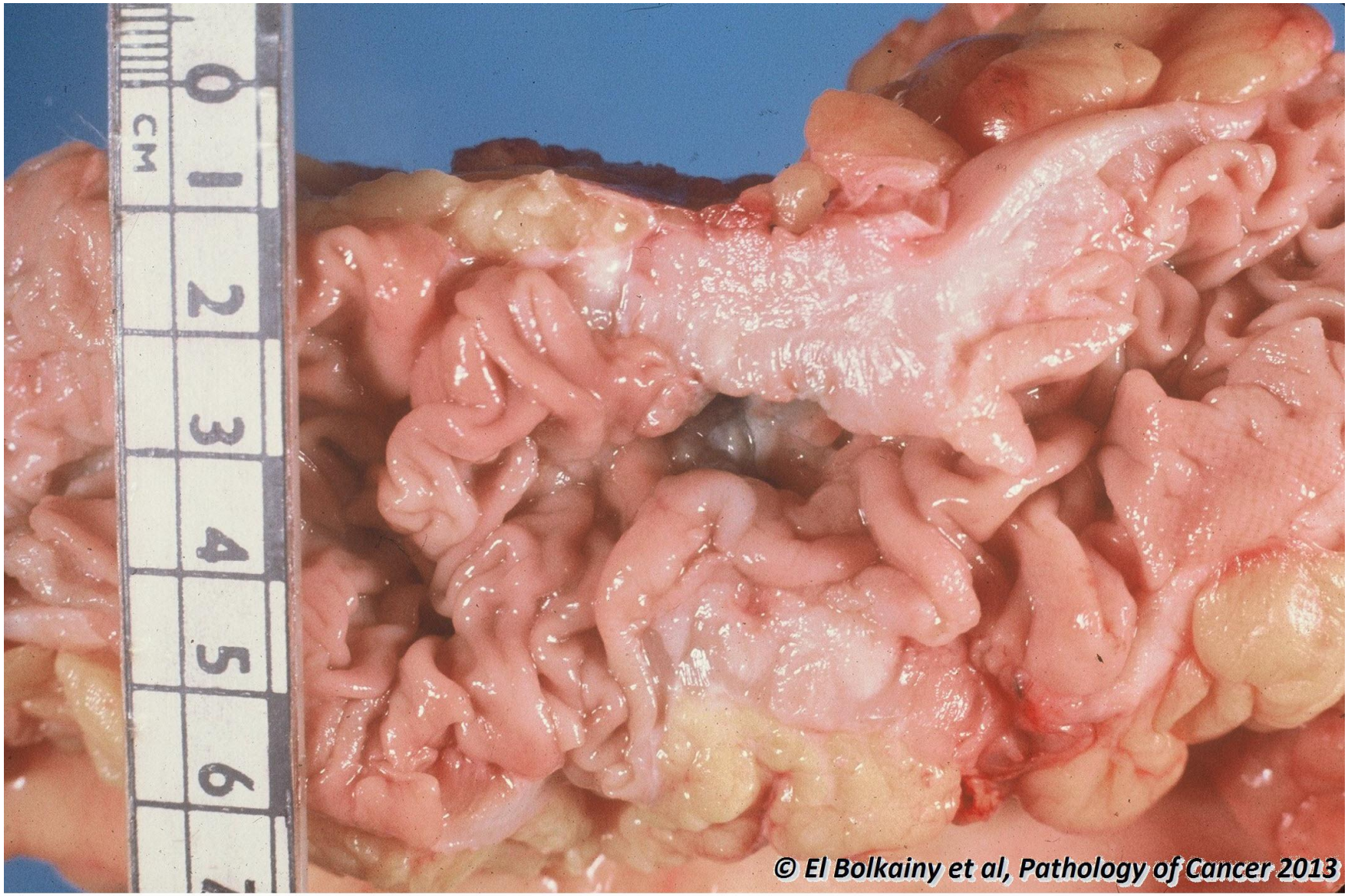


Picture 13-32 **Ileum, neuroendocrine tumor (carcinoid), gross features. A** Outer view showing puckering of peritoneum due to associated fibrosis. **B** A small tumor nodule in the wall of intestine, gray-white in color, covered by intact mucosa.

13.33 Appendix, carcinoid tumor, gross features.

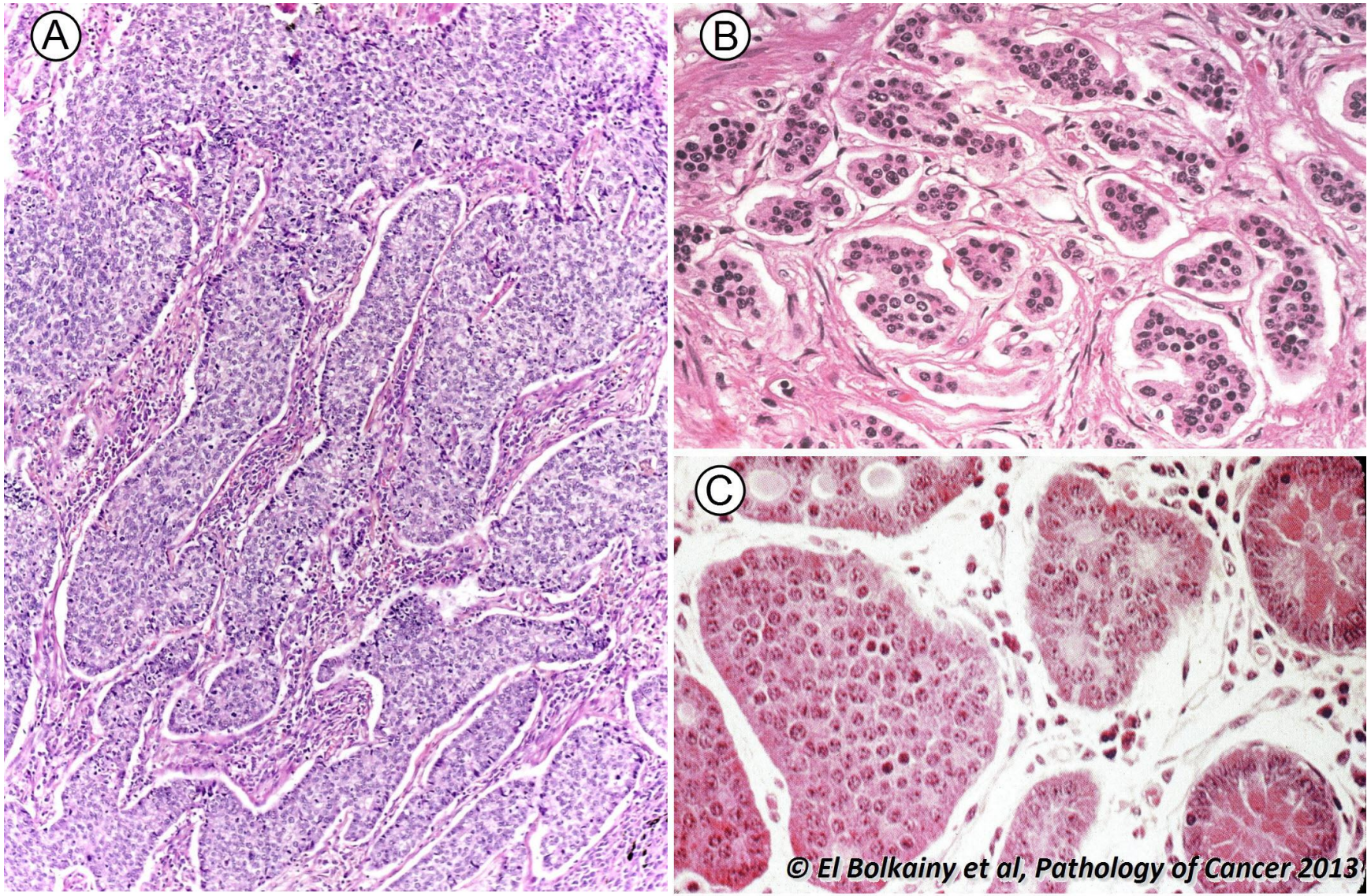
Picture 13-33 **Appendix, carcinoid tumor, gross features.** There is diffuse thickening of the wall containing the tumor with dilatation of the lumen in the distal part of appendix.

13.34 Colon, carcinoid tumor, gross features.



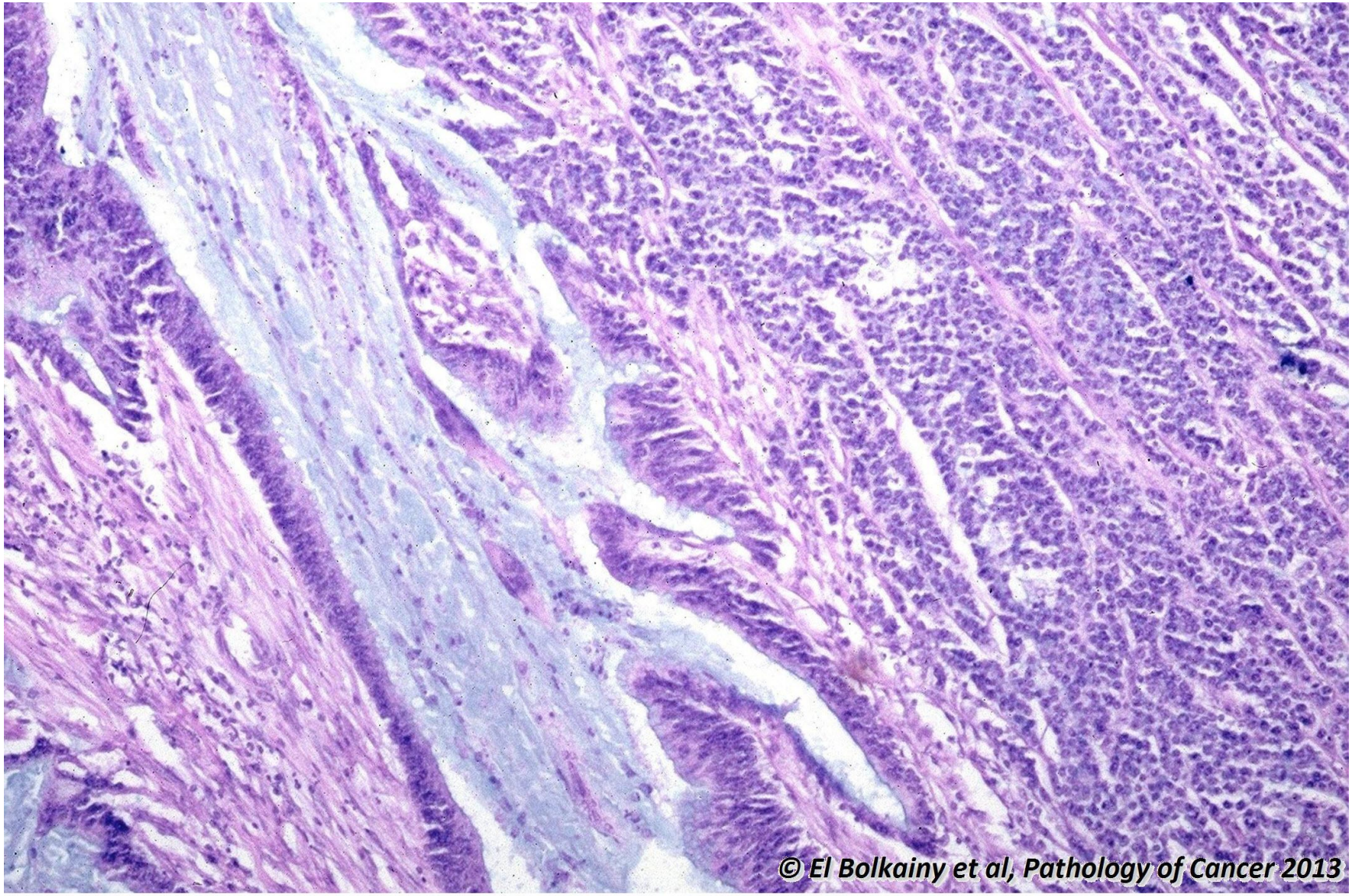
Picture 13-34 **Colon, carcinoid tumor, gross features.** The tumor is small (1x2 cm), diffusely infiltrating the wall of colon associated with fibrosis causing puckering both inside and outside the colon.

13.35 Neuroendocrine tumors, various histologic patterns.



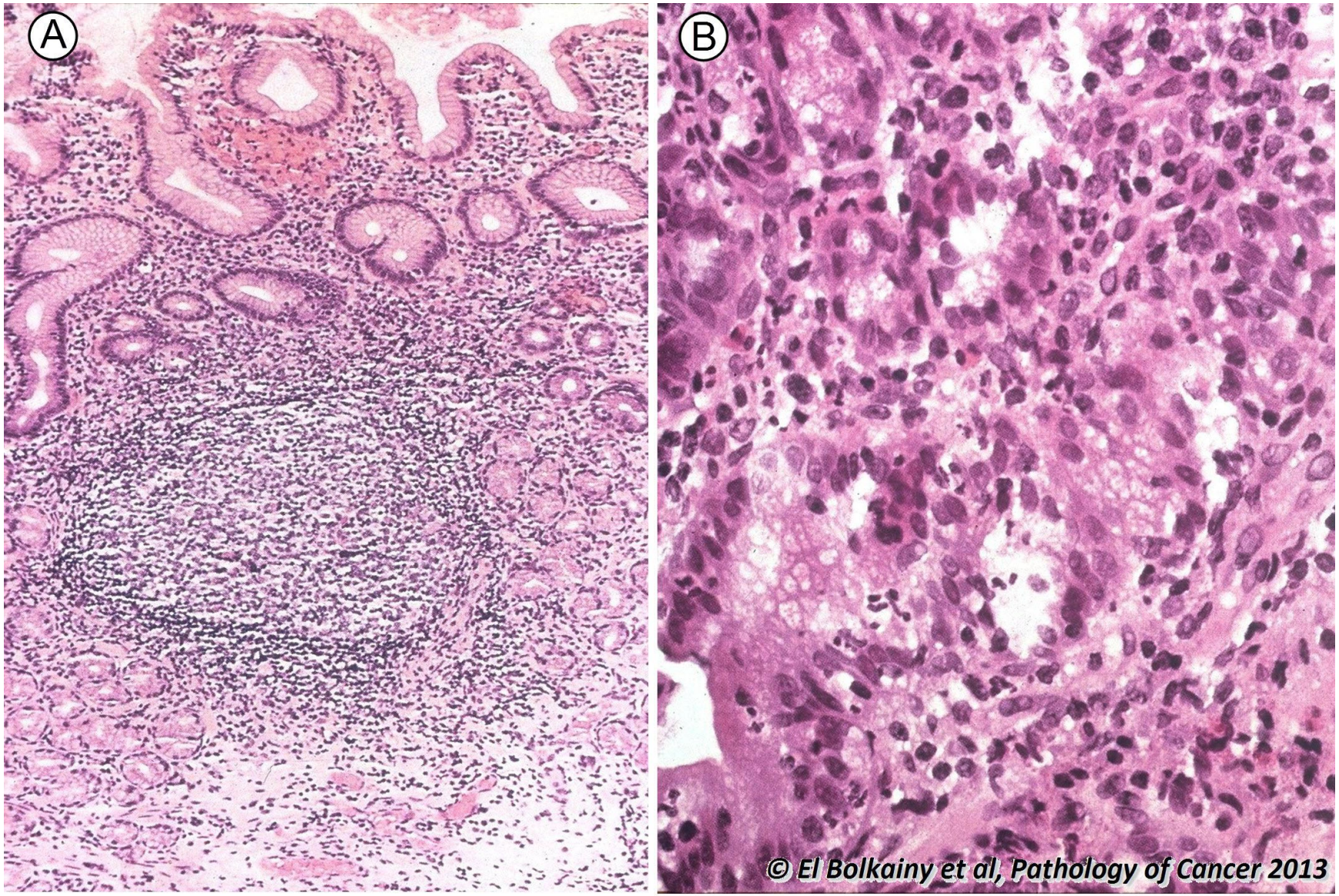
Picture 13-35 **Neuroendocrine tumors, various histologic patterns. A** Trabecular pattern. **B** Insular and tubular patterns and **C** cribriform pattern (pseudoglandular). Note the small relatively uniform cells and fibrosis in the stroma (desmoplasia).

13.36 Neuroendocrine tumor with adenocarcinoma differentiation (adenocarcinoid), histology.



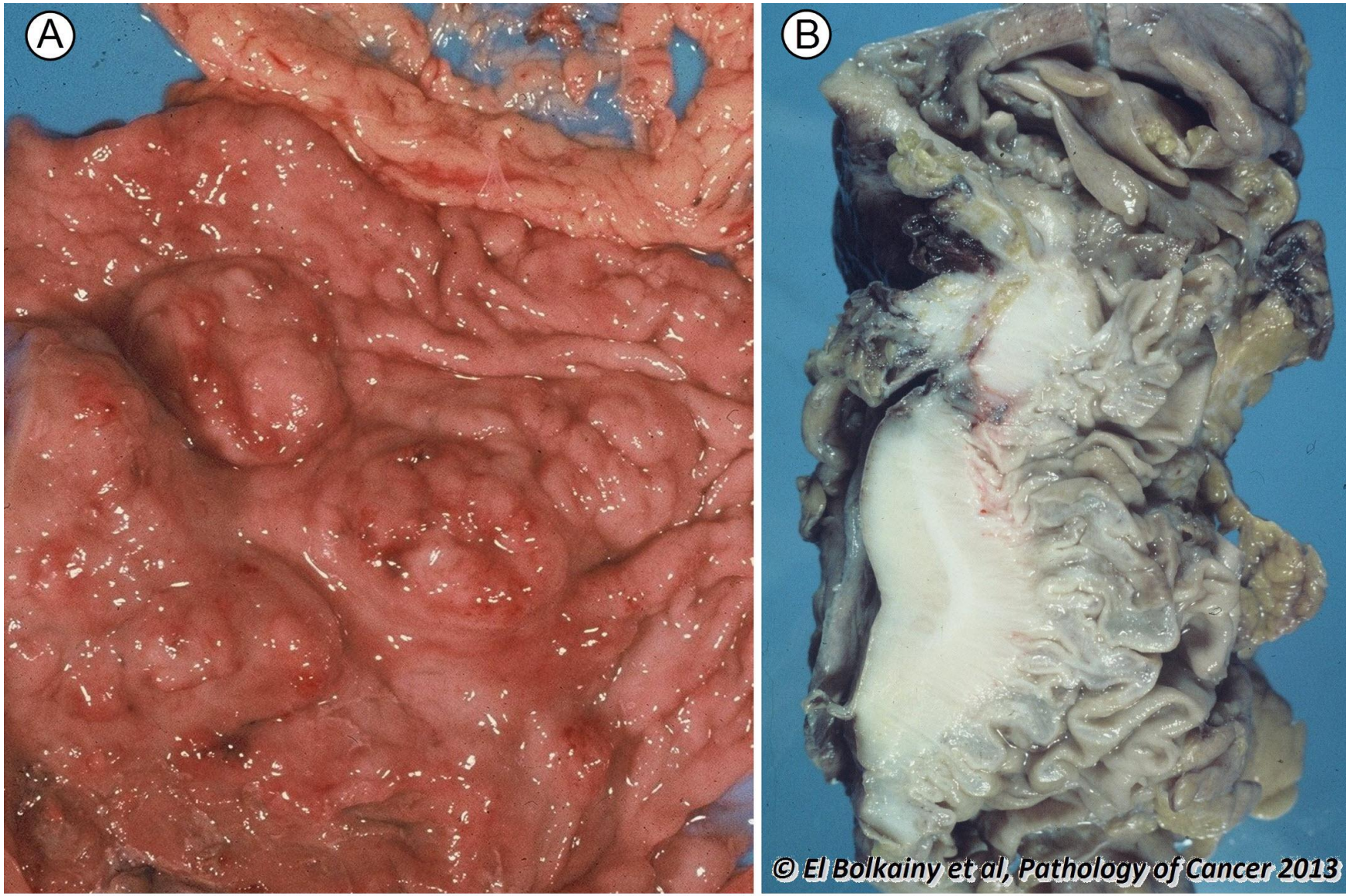
Picture 13-36 **Neuroendocrine tumor with adenocarcinoma differentiation (adenocarcinoid), histology.** This biphasic tumor is composed of neuroendocrine cells (chromogranin positive), as well as, glandular component (positive for CK, CEA and alcian blue).

13.37 Stomach, H. pylori-associated chronic active antral gastritis, histology.



Picture 13-37 **Stomach, H. pylori-associated chronic active antral gastritis, histology. A** and **B** Dense infiltrate of lymphocytes and plasma cells. The presence of neutrophils indicates activity of inflammation. It may be associated with intestinal metaplasia or dysplasia. The lesion is precancerous (progresses to lymphoma or carcinoma).

13.38 Stomach, MALT lymphoma, gross features.

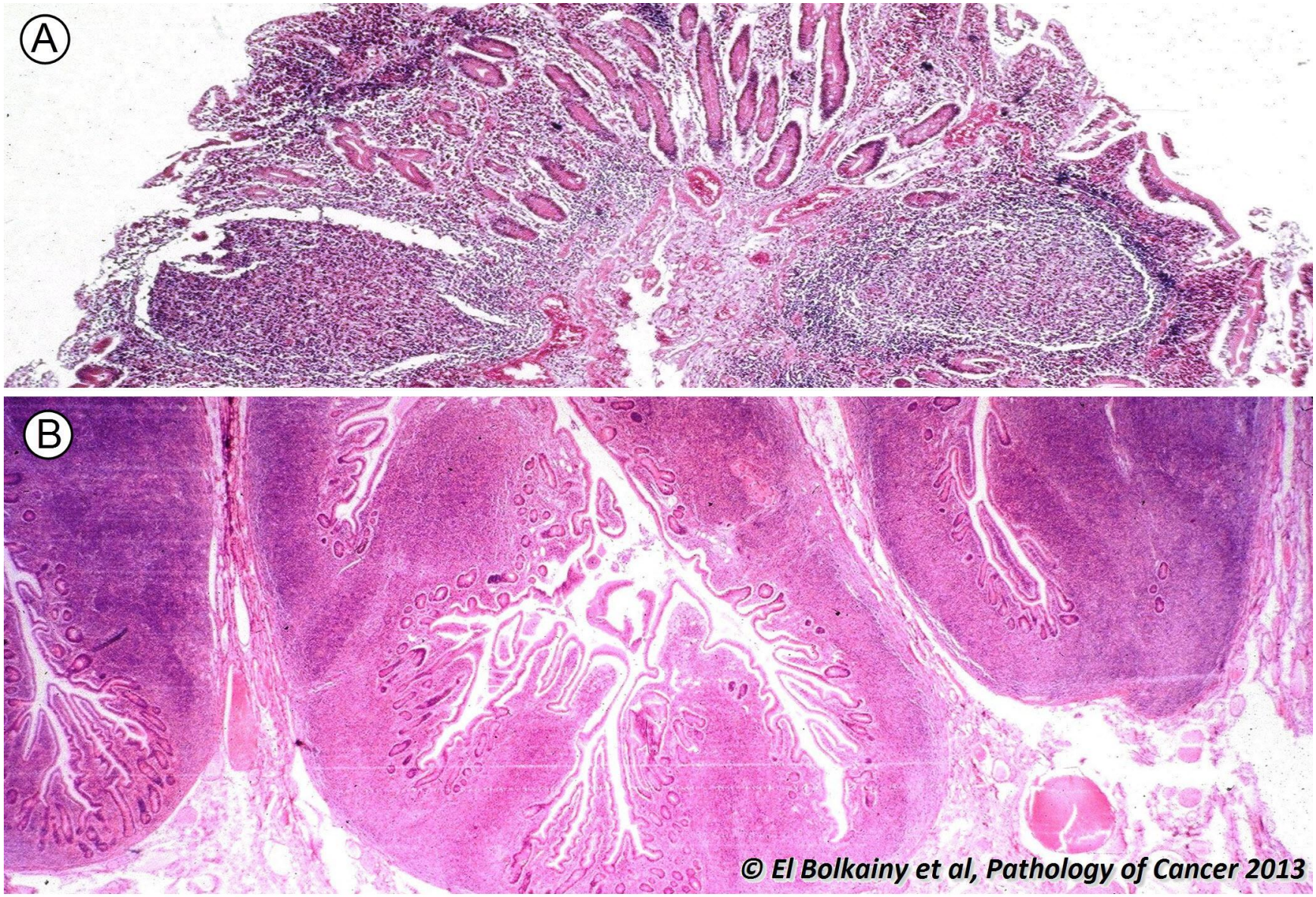


Picture 13-38 **Stomach, MALT lymphoma, gross features. A** Surface view, nodular and ulcerative tumors interrupting gastric rugae. **B** Cross section, characteristic white (fish-meat) appearance.

13.39 jejunum, immuno-proliferative small intestinal disease (IPSID).

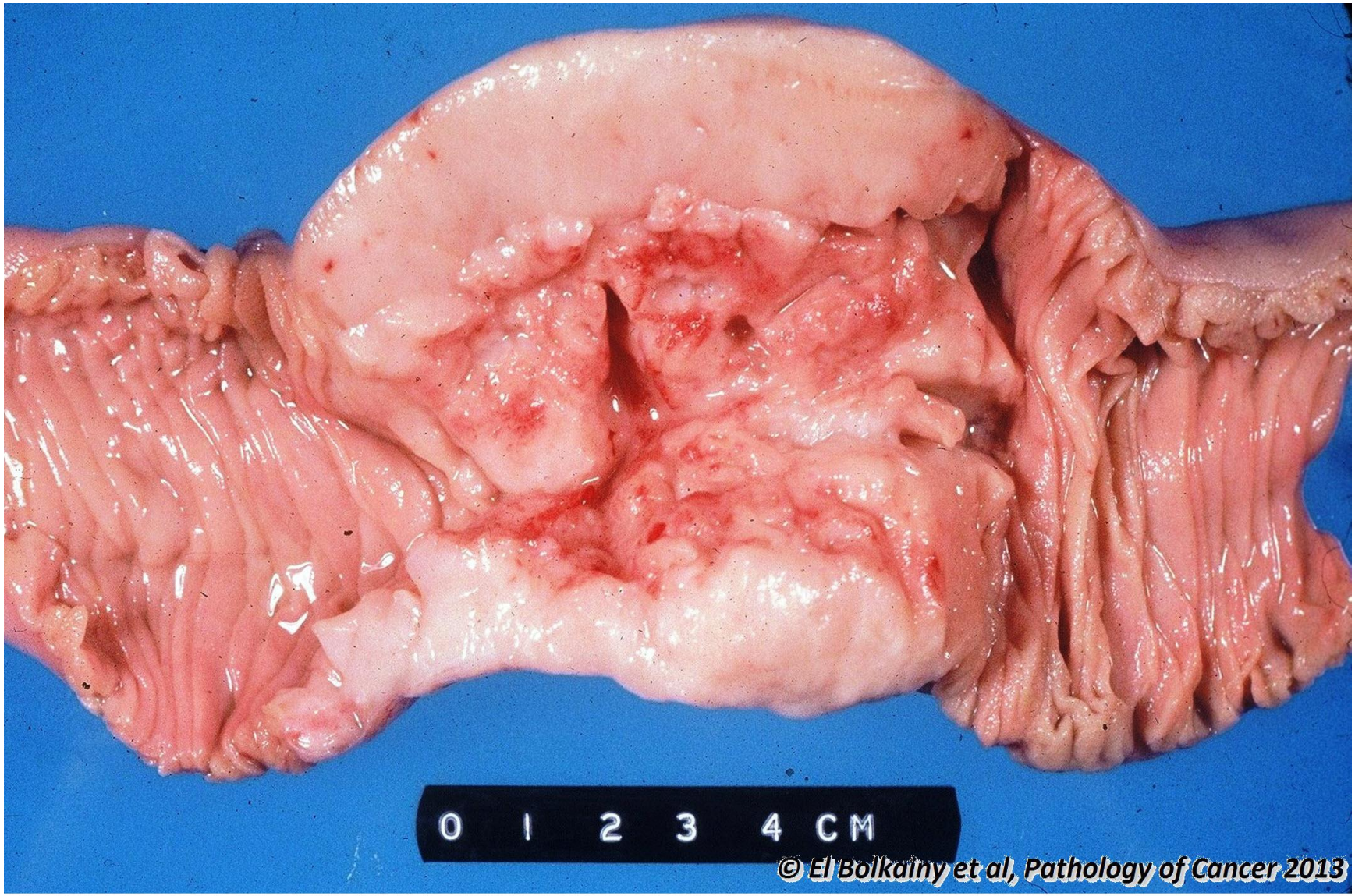
Picture 13-39 **jejunum, immuno-proliferative small intestinal disease (IPSID). A** Gross features, band-like whitish infiltrate of tumor invading submucosa and muscle layer. **B** Computer scan of the whole tissue section of the specimen.

13.40 Jejunum, IPSID.



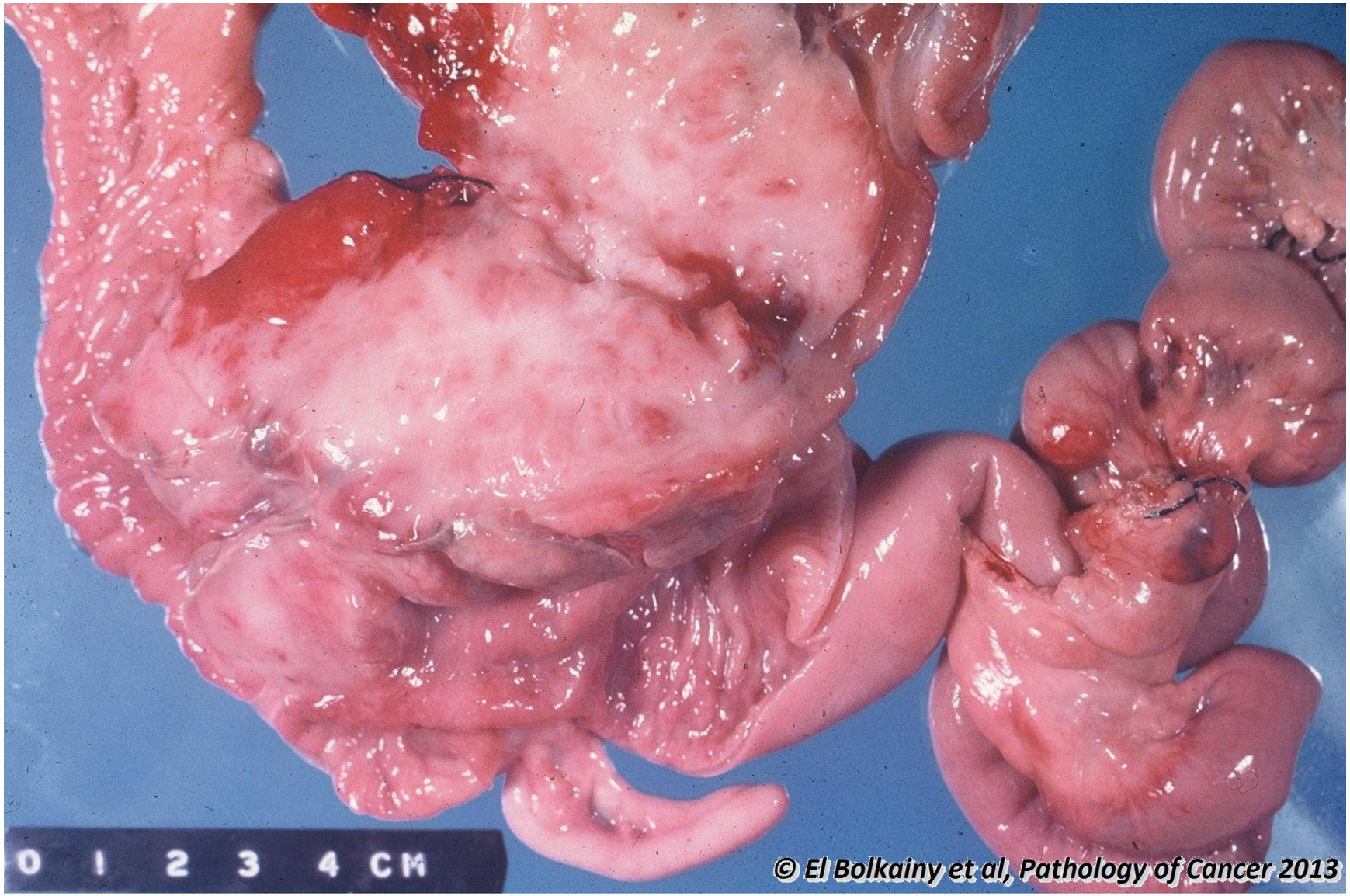
Picture 13-40 **Jejunum, IPSID. A** Early lymphoid hyperplasia stage with germinal centers. It appears confined to mucosa and covered by intact surface epithelium. **B** Lymphoma stage, dense infiltrate without germinal centers invading submucosa and muscle. Immunostains: positivity to CD20 and alpha heavy chain globulin.

13.41 Jejunum, IPSID, tumor stage, gross features.



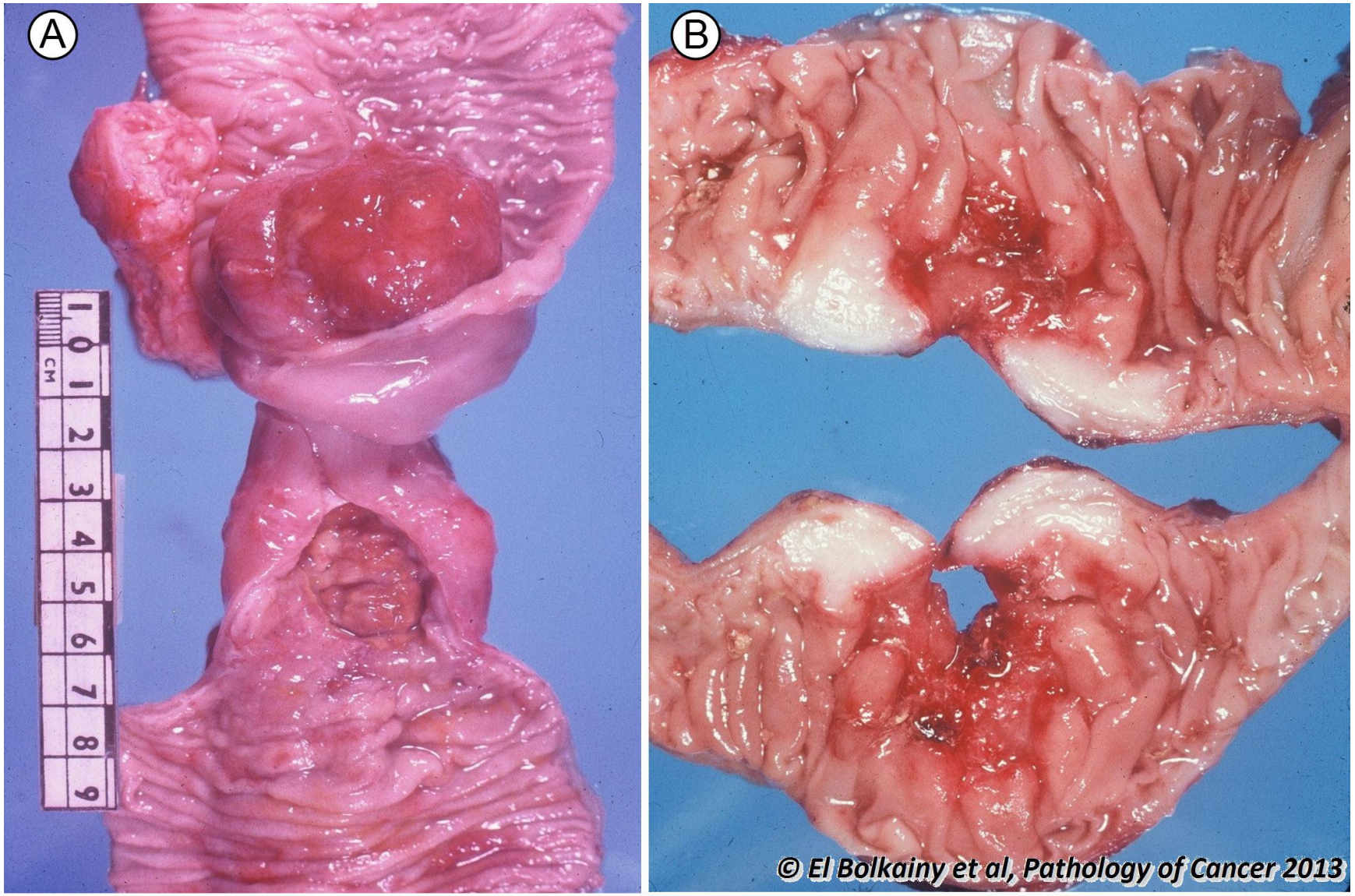
Picture 13-41 **Jejunum, IPSID, tumor stage, gross features.** There is marked thickening of the entire circumference of jejunum by an ulcerating mass.

13.42 Caecum, Burkitt lymphoma, gross features.



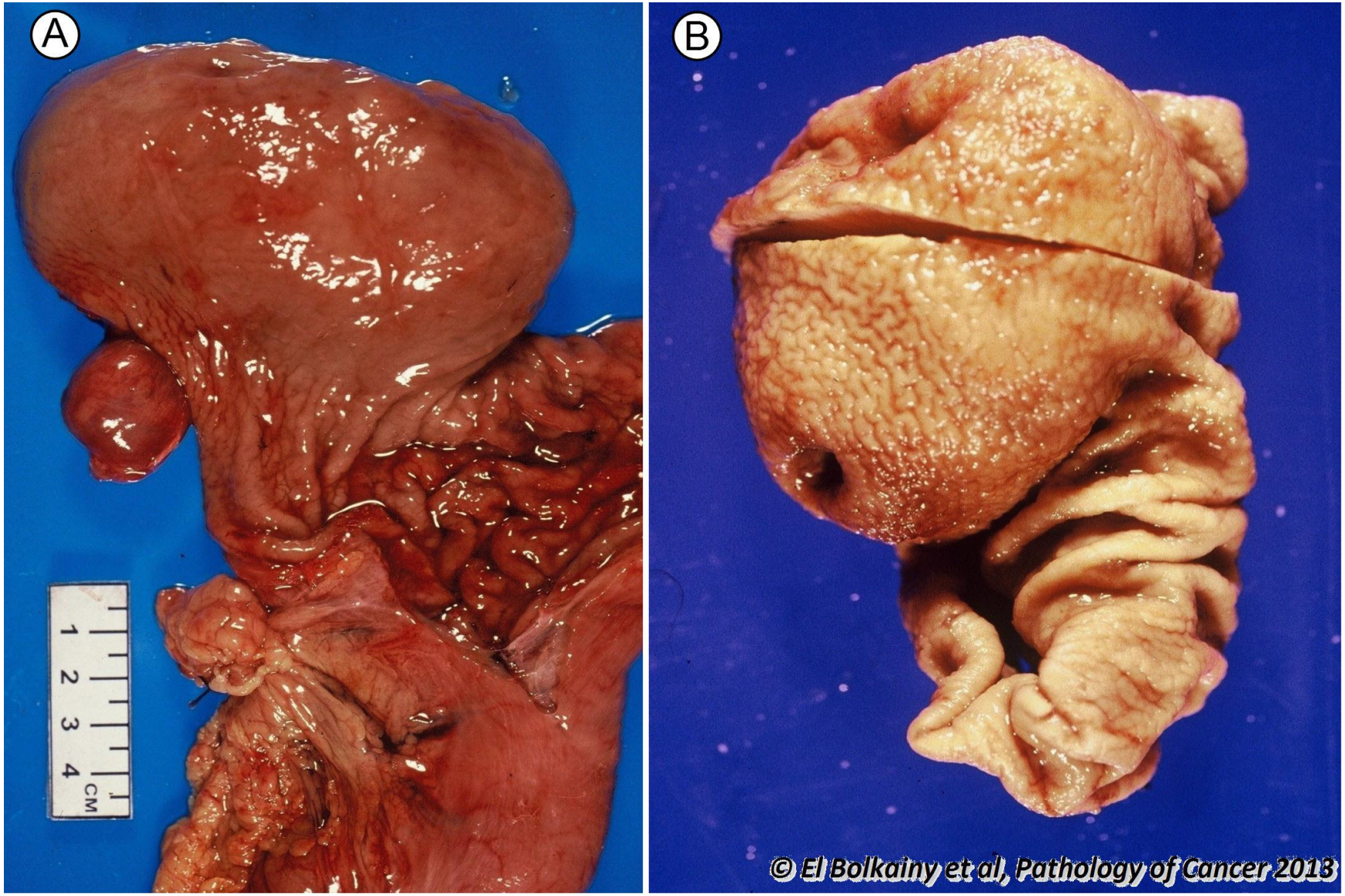
Picture 13-42 **Caecum, Burkitt lymphoma, gross features.** A Large mass of lymphoma involving the caecum with characteristic whitish color. Typically affecting children.

13.43 Small intestine, complicated lymphoma, gross features.



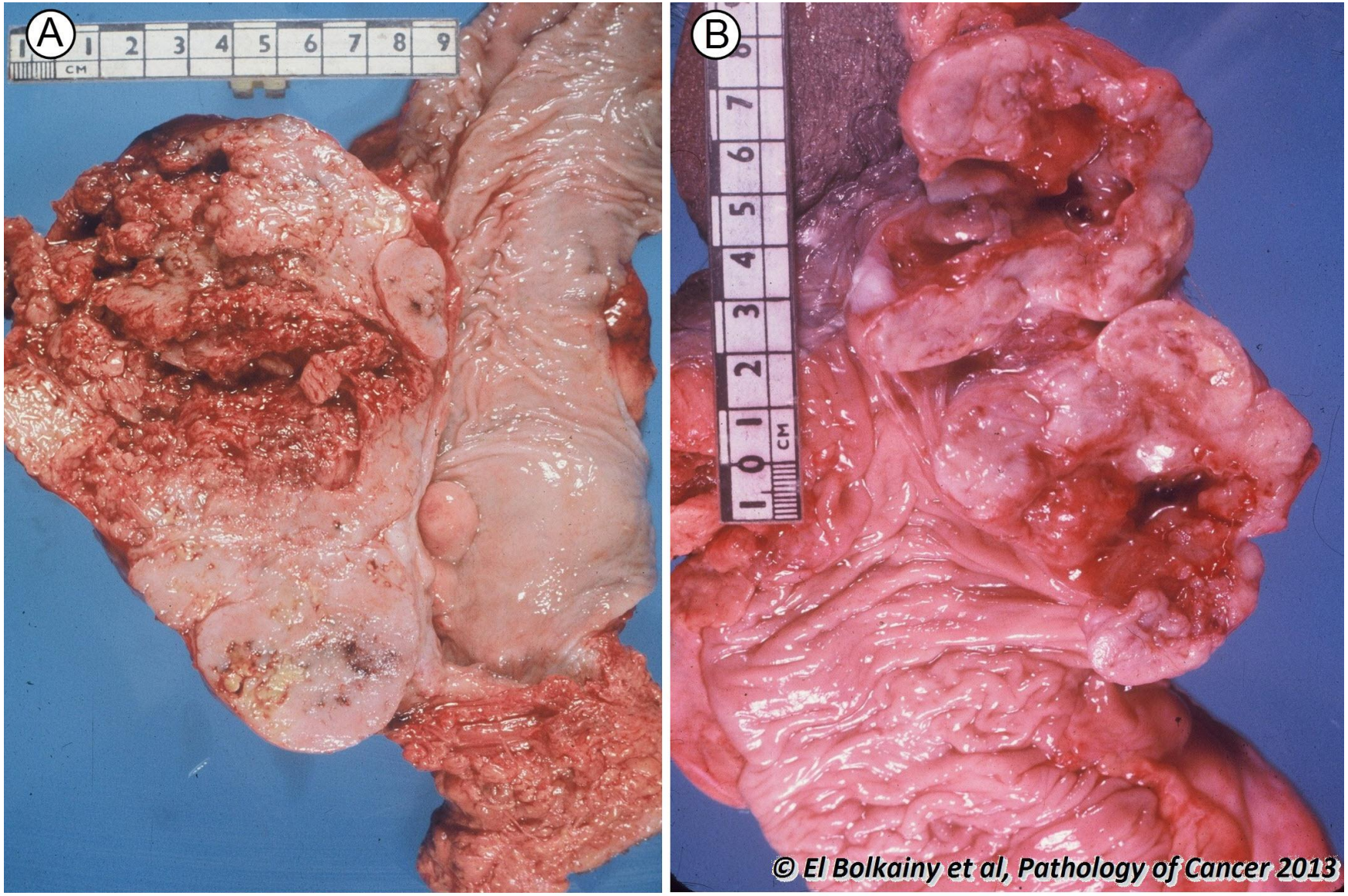
Picture 13-43 **Small intestine, complicated lymphoma, gross features. A** Intussusception induced by the tumor resulting in intestinal obstruction. **B** Perforation of the tumor and peritonitis, usually induced by chemotherapy.

13.44 Stomach, gastrointestinal stromal tumor (GIST), gross features.



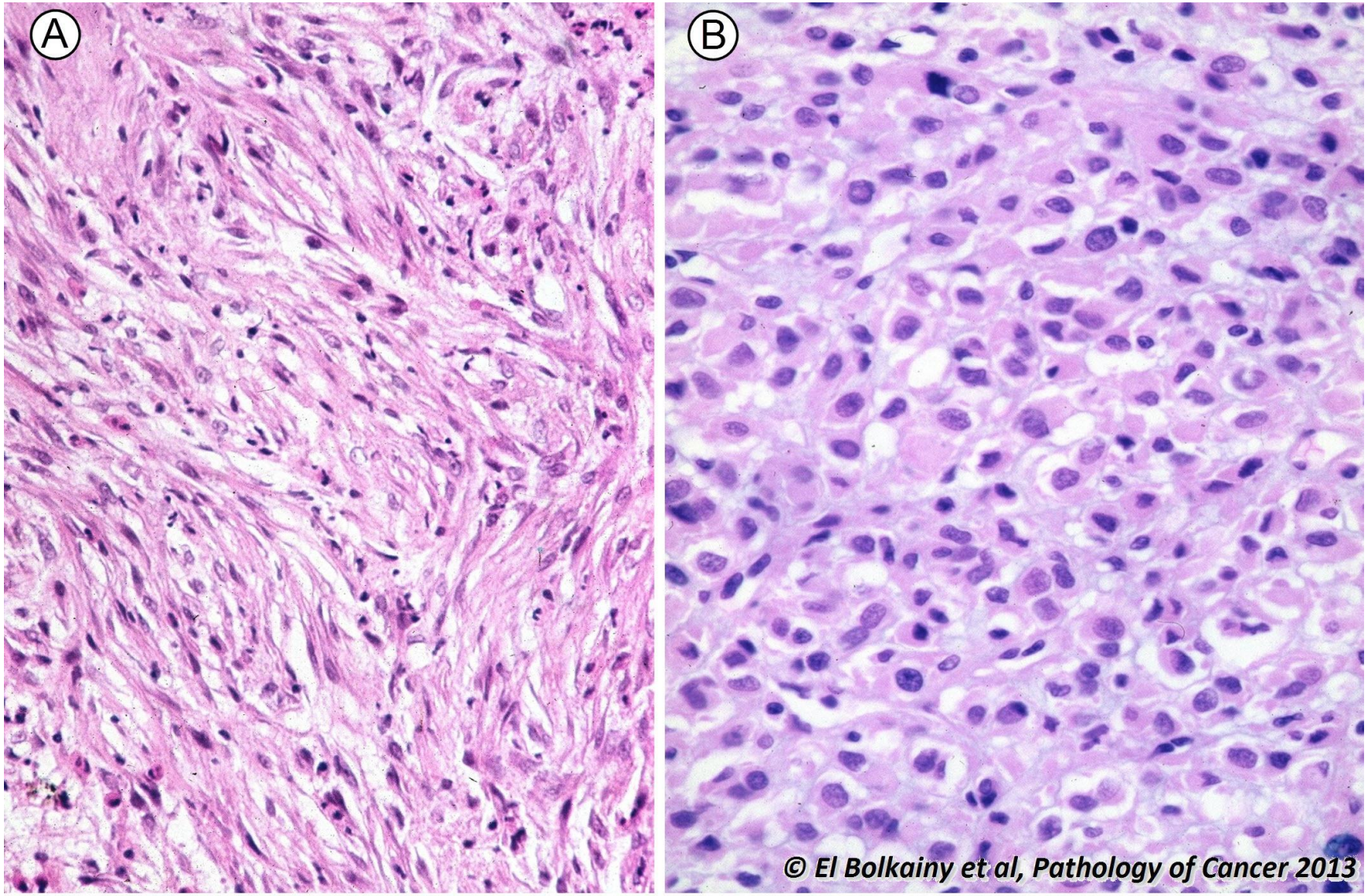
Picture 13-44 **Stomach, gastrointestinal stromal tumor (GIST), gross features. A** Extramural or exophytic type. **B** Endophytic type, projecting into the lumen, mostly covered by intact mucosa with only small ulcer in its upper part.

13.45 Rectum, gastrointestinal stromal tumor (GIST), gross features of mural type.



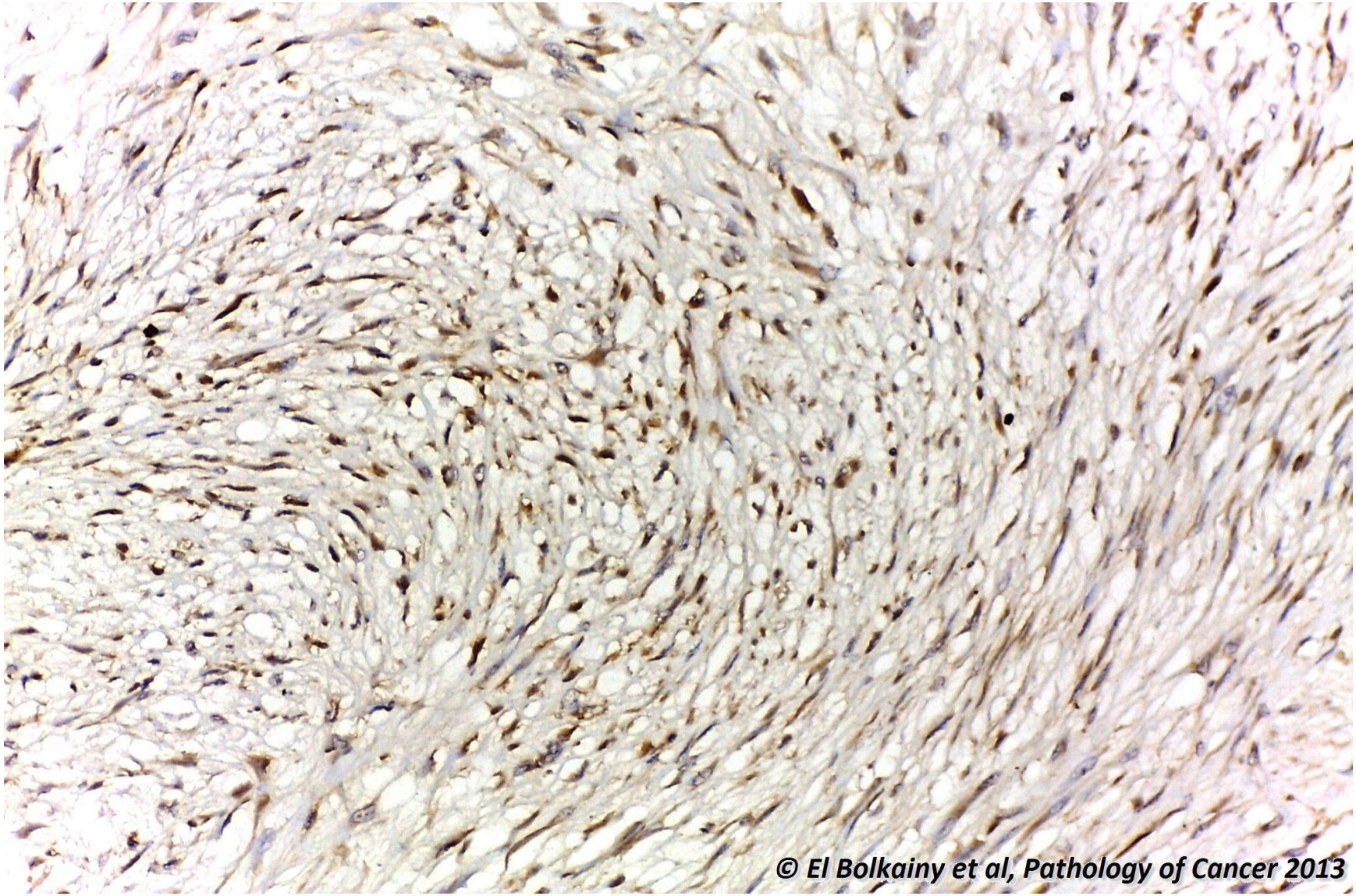
Picture 13-45 **Rectum, gastrointestinal stromal tumor (GIST), gross features of mural type. A** Note the gray white cut section with focal hemorrhage, cystic change and rounded circumscribed appearance. **B** The tumor is mostly coverd by intact mucosa.

13.46 Gastrointestinal stromal tumor (GIST), histology.



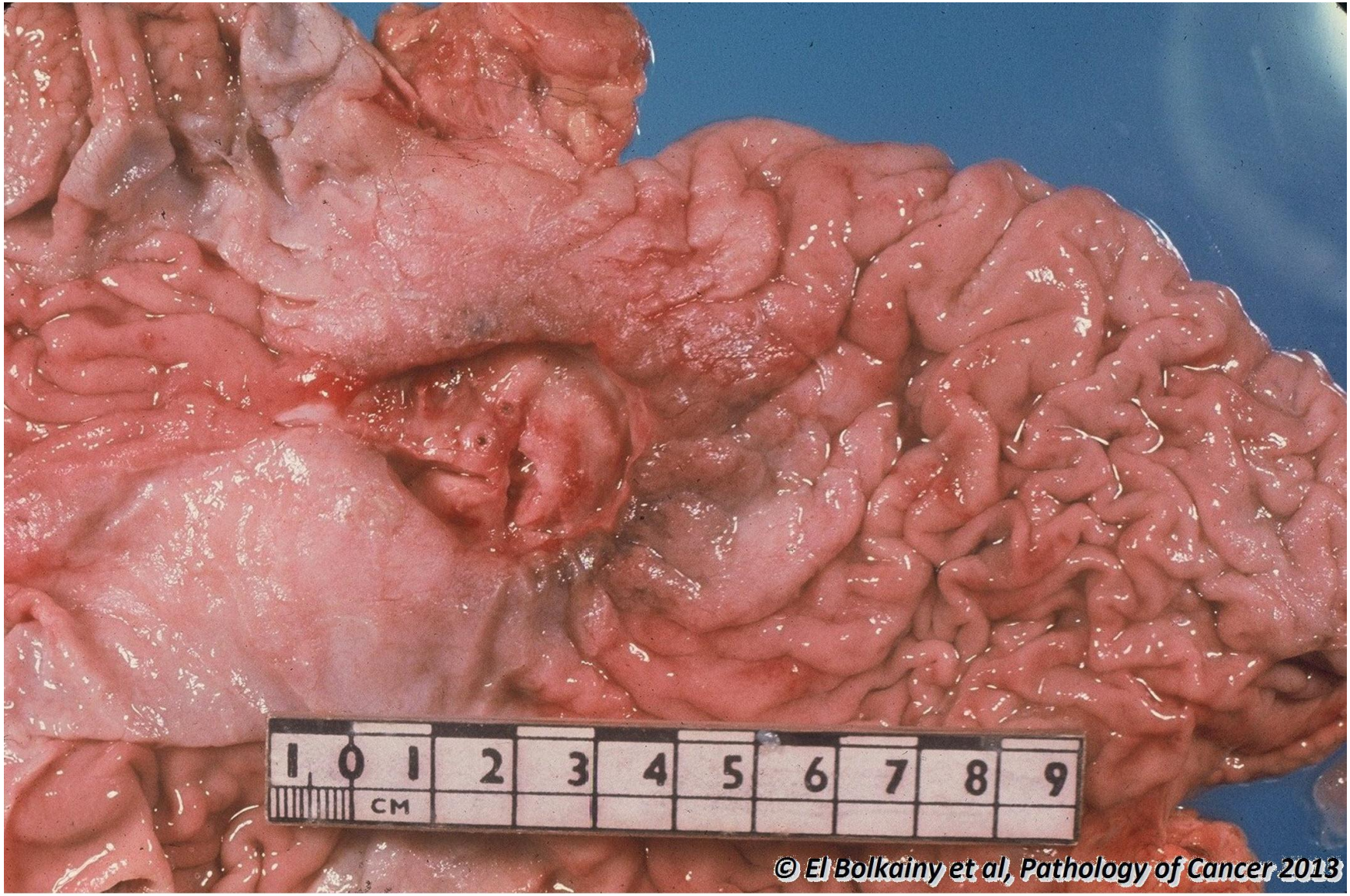
Picture 13-46 **Gastrointestinal stromal tumor (GIST), histology.** It is composed of **A** spindle cells arranged in bundles, **B** less commonly nested epithelioid cells with cytoplasmic vacuoles. Aggressive behavior is dependant on location (highest risk in small intestine and lowest risk in colorectal tumors), as well as, tumor size and mitotic rate.

13.47 Gastrointestinal stromal tumor (GIST), immunoreactivity.



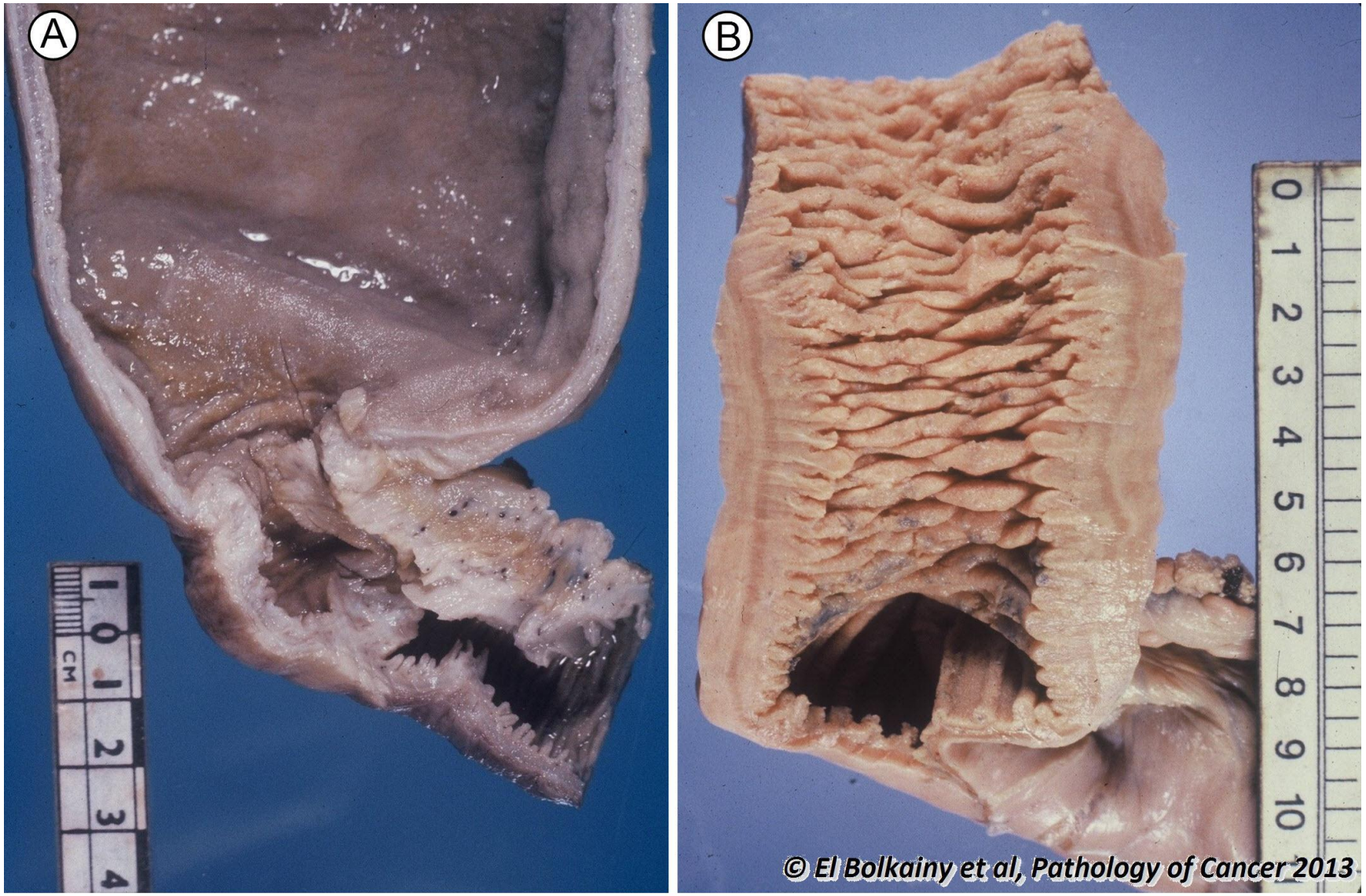
Picture 13-47 **Gastrointestinal stromal tumor (GIST), immunoreactivity.** About 95% of GISTs are positive for c-Kit (CD117) and 5% to platelet-derived growth factor receptor (PDGFR). Such tumors are responsive to anti-tyrosine kinase targeted therapy (Gleevec).

13.48 Stomach, penetrating giant ulcer (pseudotumor), gross features.



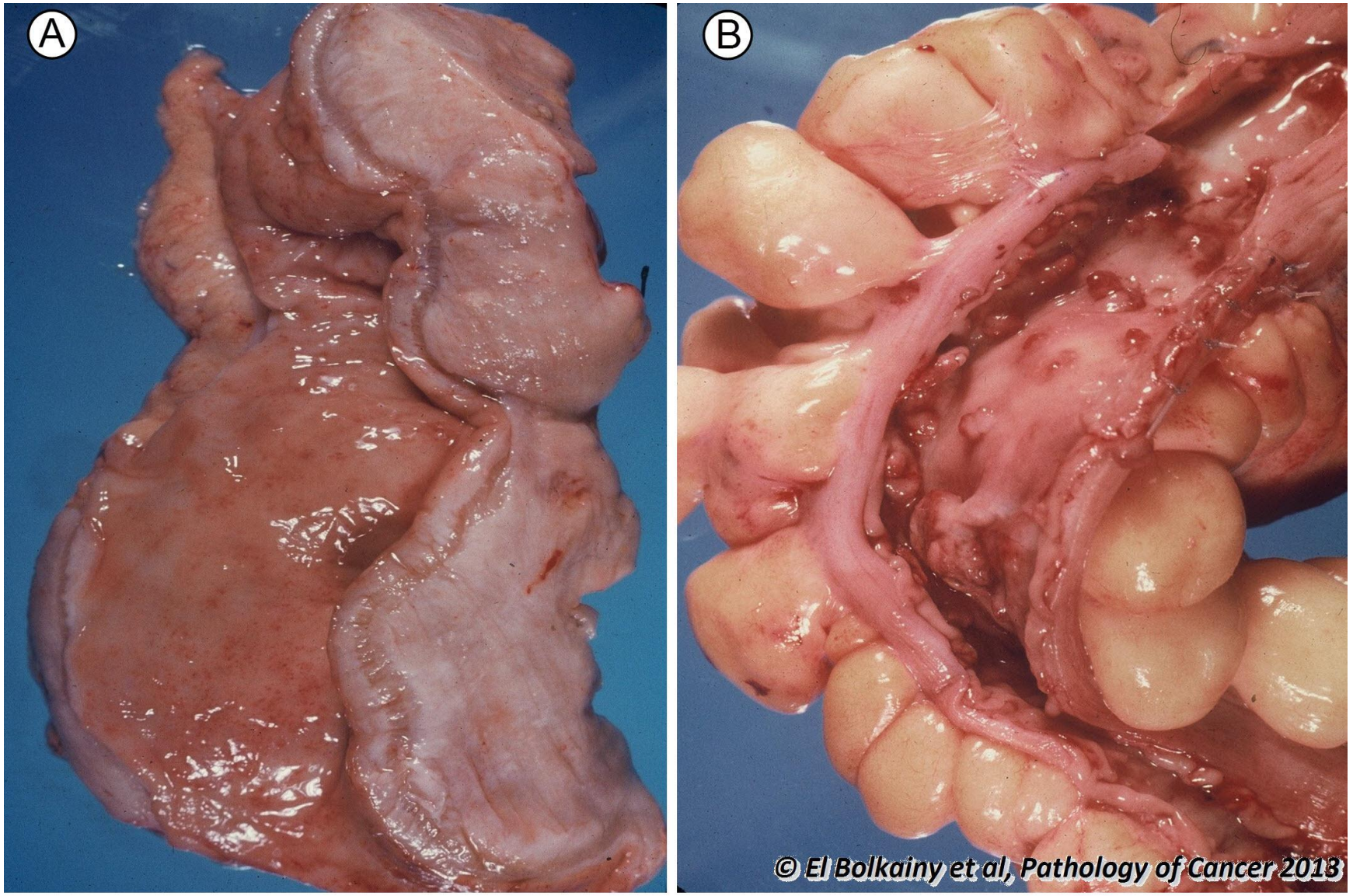
Picture 13-48 **Stomach, penetrating giant ulcer (pseudotumor), gross features.** A very large inflammatory ulcer with punched edge and dense fibrotic floor. A similar ulcer may affect the rectum. These should not be confused with malignancy.

13.49 Jejunum, bilharzial stricture, gross features.



Picture 13-49 **Jejunum, bilharzial stricture, gross features. A** An annular stricture with proximal dilatation of intestine. **B** Diffuse bilharzial granuloma showing marked thickening of the wall of intestine, grossly simulates diffuse carcinomas.

13.50 Colon, bilharzial pericolic mass, gross features.

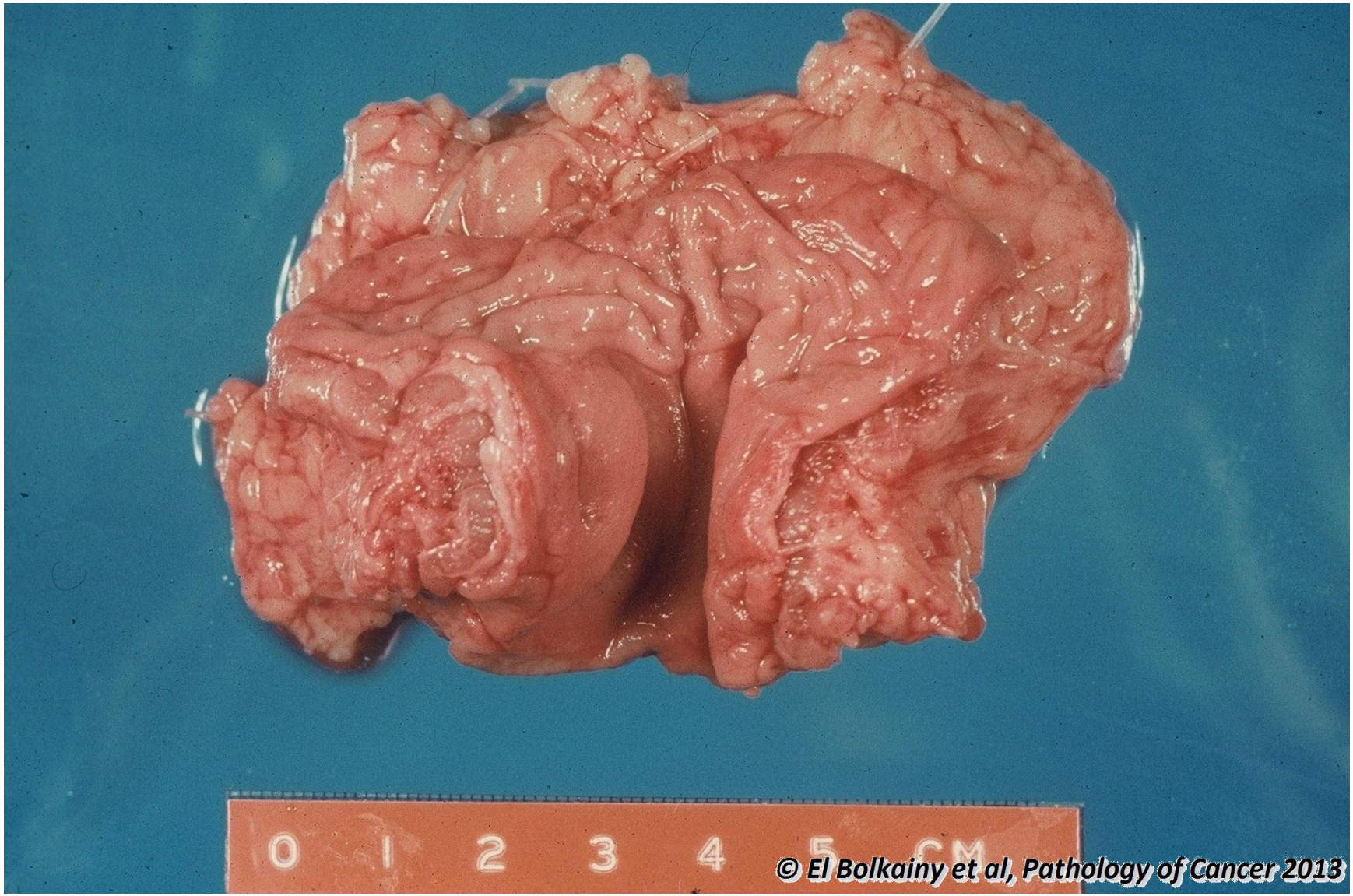


Picture 13-50 **Colon, bilharzial pericolic mass, gross features.** There are multiple bilharzial granulomatous polyps in the lumen, but large pericolic mass around sigmoid colon. **A** Surface view. **B** Cut section.

13.51 Colon, bilharzial granuloma, histology.

Picture 13-51 **Colon, bilharzial granuloma, histology. A** Granulomatous reaction rich in histiocytes and eosinophils, around a viable bilharzia egg. **B** Schistosoma mansoni egg with subterminal spine.

13.52 Rectum, inflammatory stricture, gross features.



Picture 13-52 **Rectum, inflammatory stricture, gross features.** A non-specific inflammatory stricture may simulate malignant stricture. Also, idiopathic giant rectal ulcer may cause a serious diagnostic pitfall of malignancy.

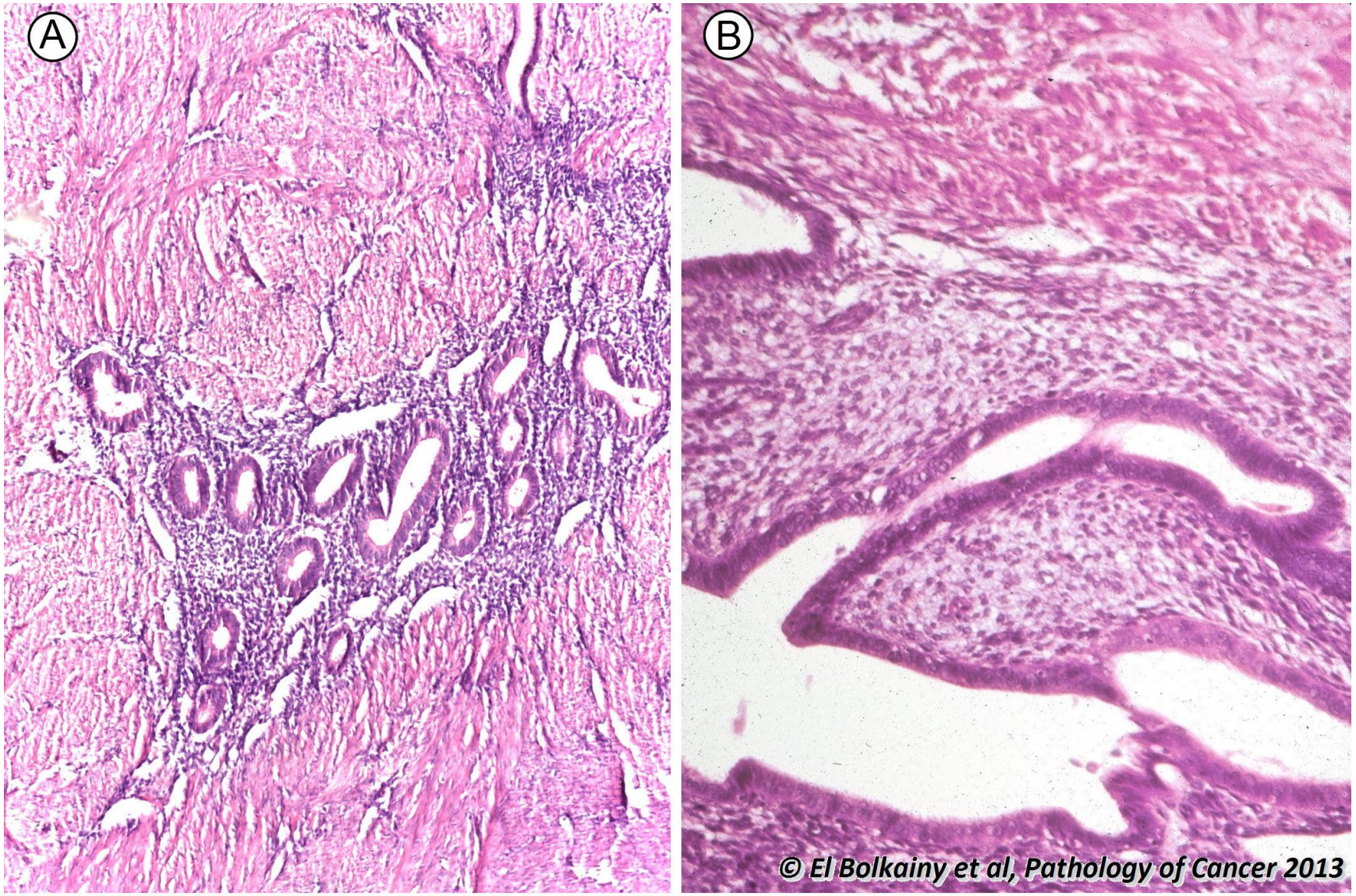
13.53 Transverse colon and greater omentum, bilharzial mass, gross features.

Picture 13-53 **Transverse colon and greater omentum, bilharzial mass, gross features.** Extensive granuloma in the omentum may produce large firm masses which may be confused with omental metastases or soft tissue sarcomas. It is always safe to do frozen section for such cases.

13.54 Pelvic peritoneum, endometriosis, gross features.

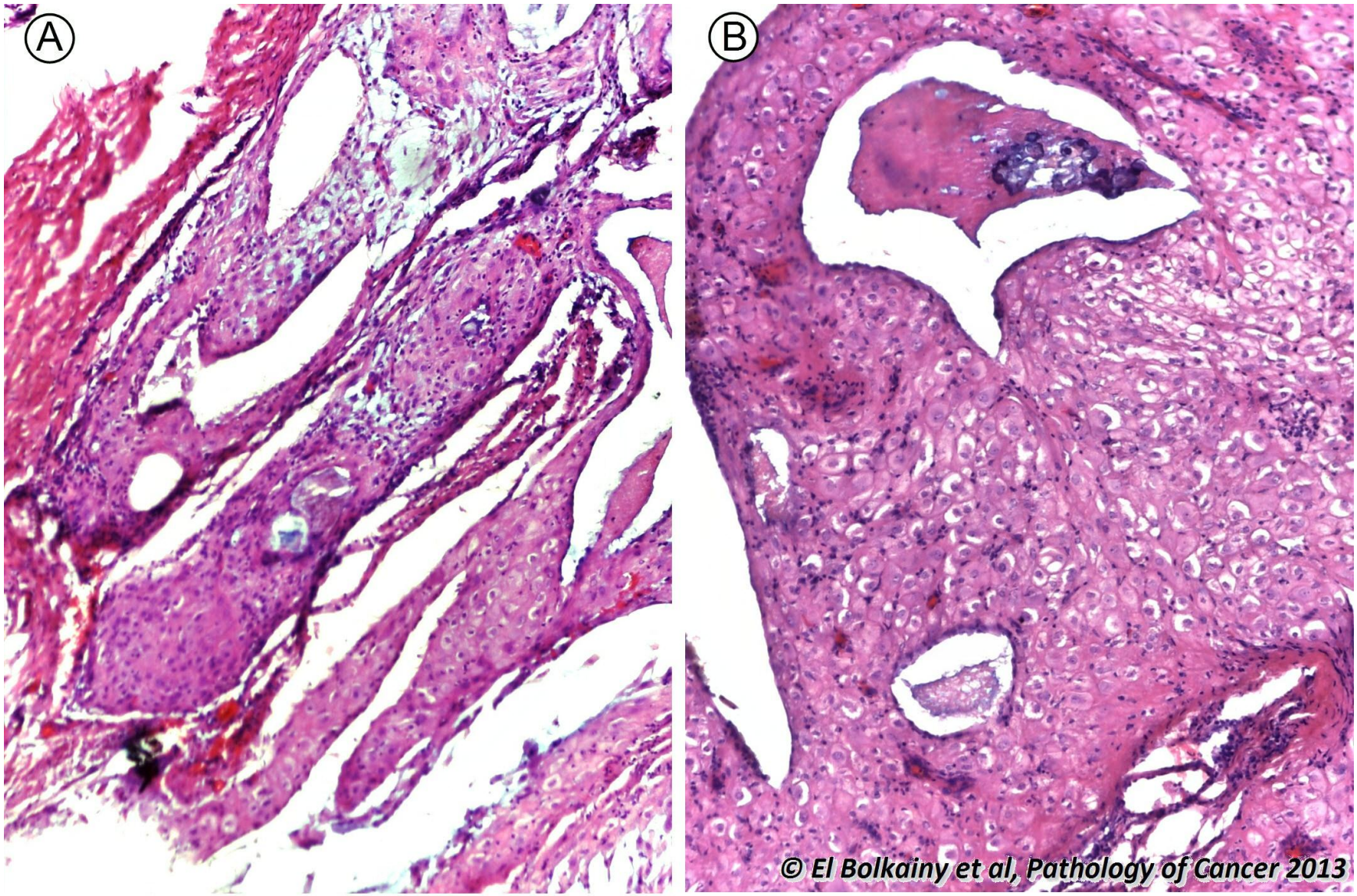
Picture 13-54 **Pelvic peritoneum, endometriosis, gross features.** This lesion affects mainly the ovaries and uterine tube, presents as multiple hemorrhagic cysts with adhesions which may involve the small intestine as in this case.

13.55 Peritoneal endometriosis, histology.



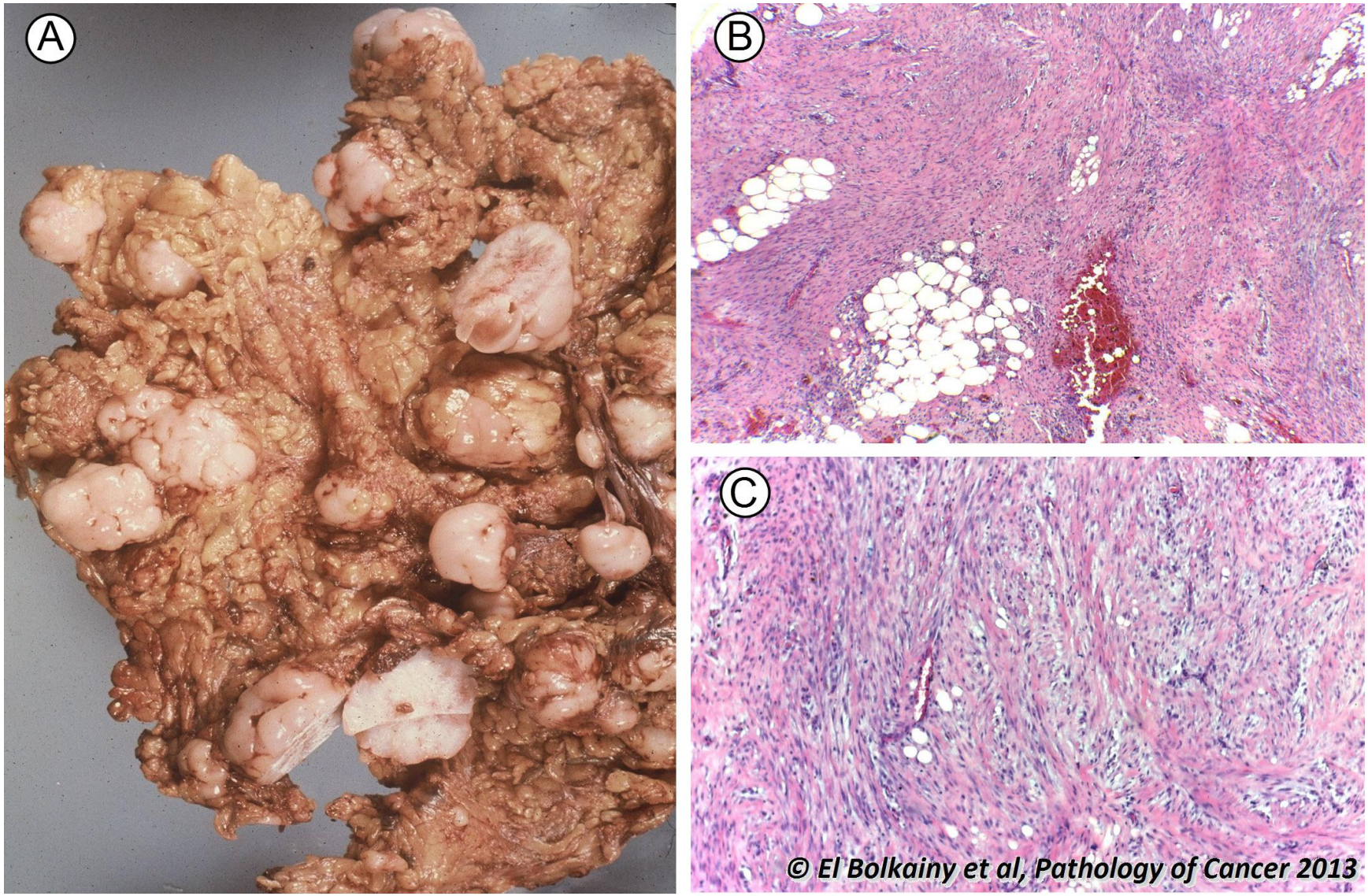
Picture 13-55 **Peritoneal endometriosis, histology.** Ectopic endometrial glands and stroma are evident. The presence of hyperplastic endometrial stroma helps to avoid the misdiagnosis of adenocarcinoma. **A** Low power. **B** High power.

13.56 Anterior abdominal wall, endometriosis, secretory pseudodecidual change in stroma, histology.



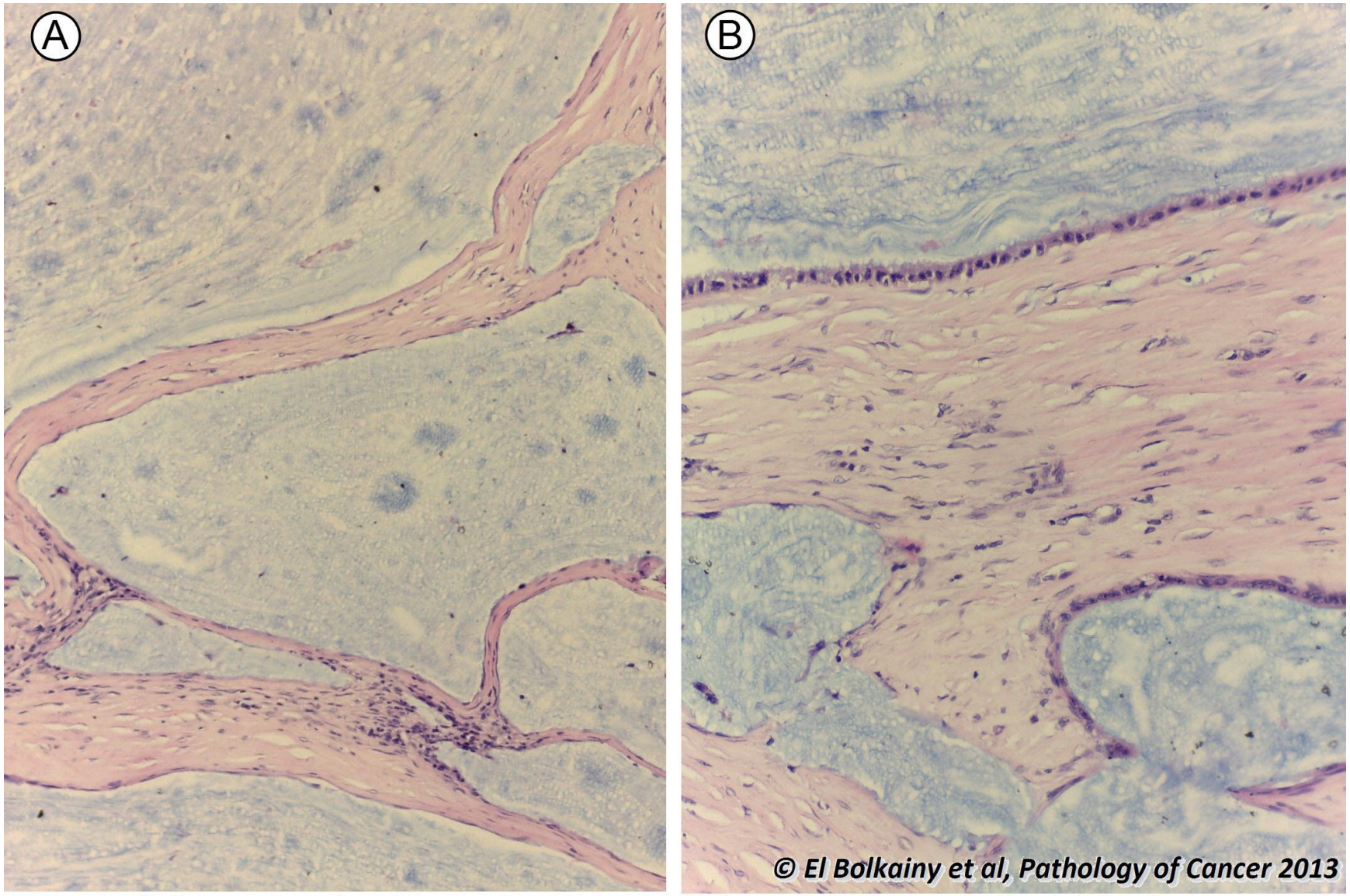
Picture 13-56 **Anterior abdominal wall, endometriosis, secretory pseudodecidual change in stroma, histology.** In this case the patient was given progesterone therapy, hence, the marked pseudodecidual reaction in stromal cells of endometriosis. This change must not be misdiagnosed as a malignant tumor. **A** Low power. **B** High power.

13.57 Greater omentum, disseminated leiomyomatosis.



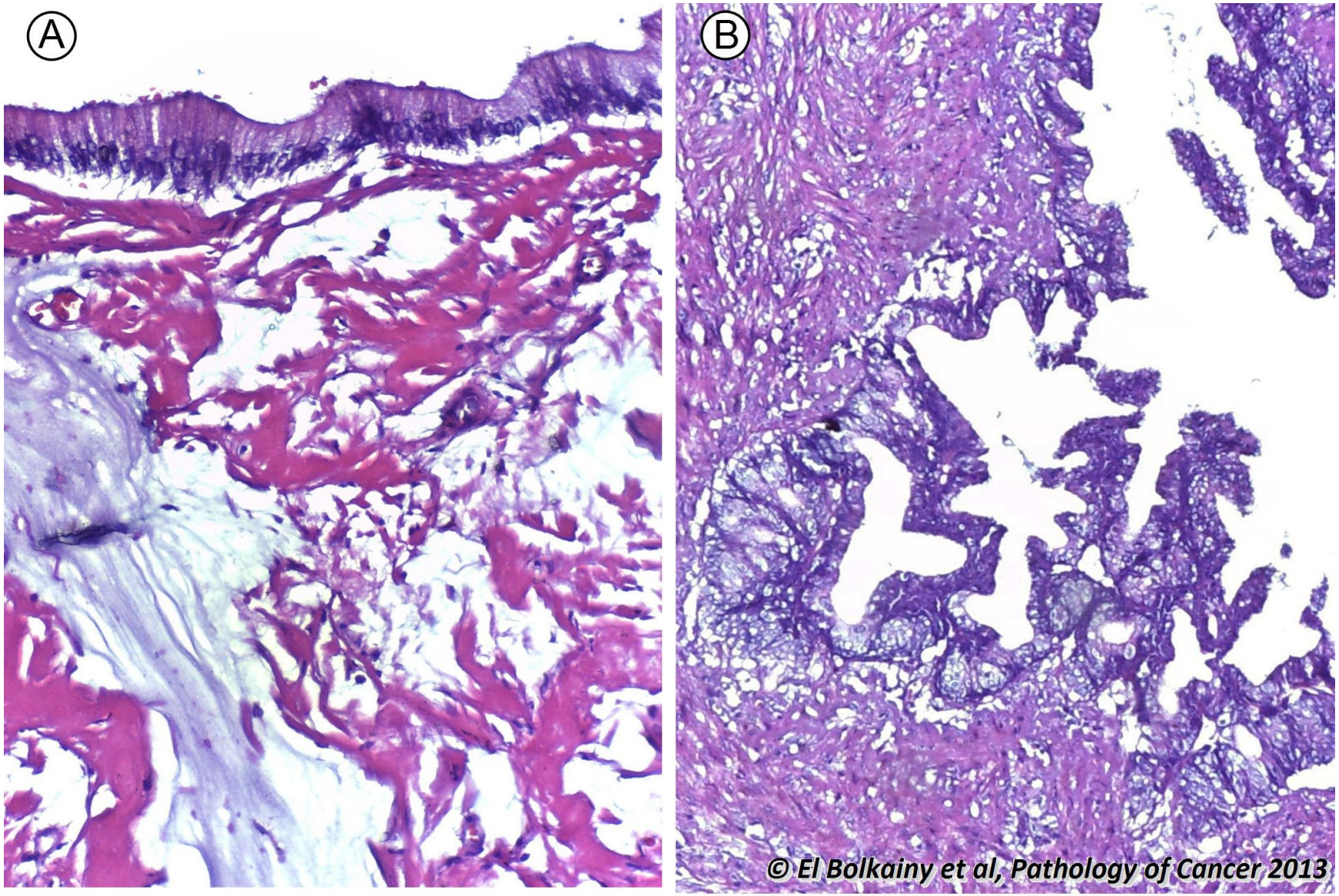
Picture 13-57 **Greater omentum, disseminated leiomyomatosis. A** Gross, multiple small round firm nodules in omentum. **B** and **C** Histology, benign smooth muscle bundles are evident. This lesion may rarely complicate pregnancy, caeserian section or ruptured teratoma.

13.58 Peritoneum, pseudomyxoma peritonei, low grade, histology.



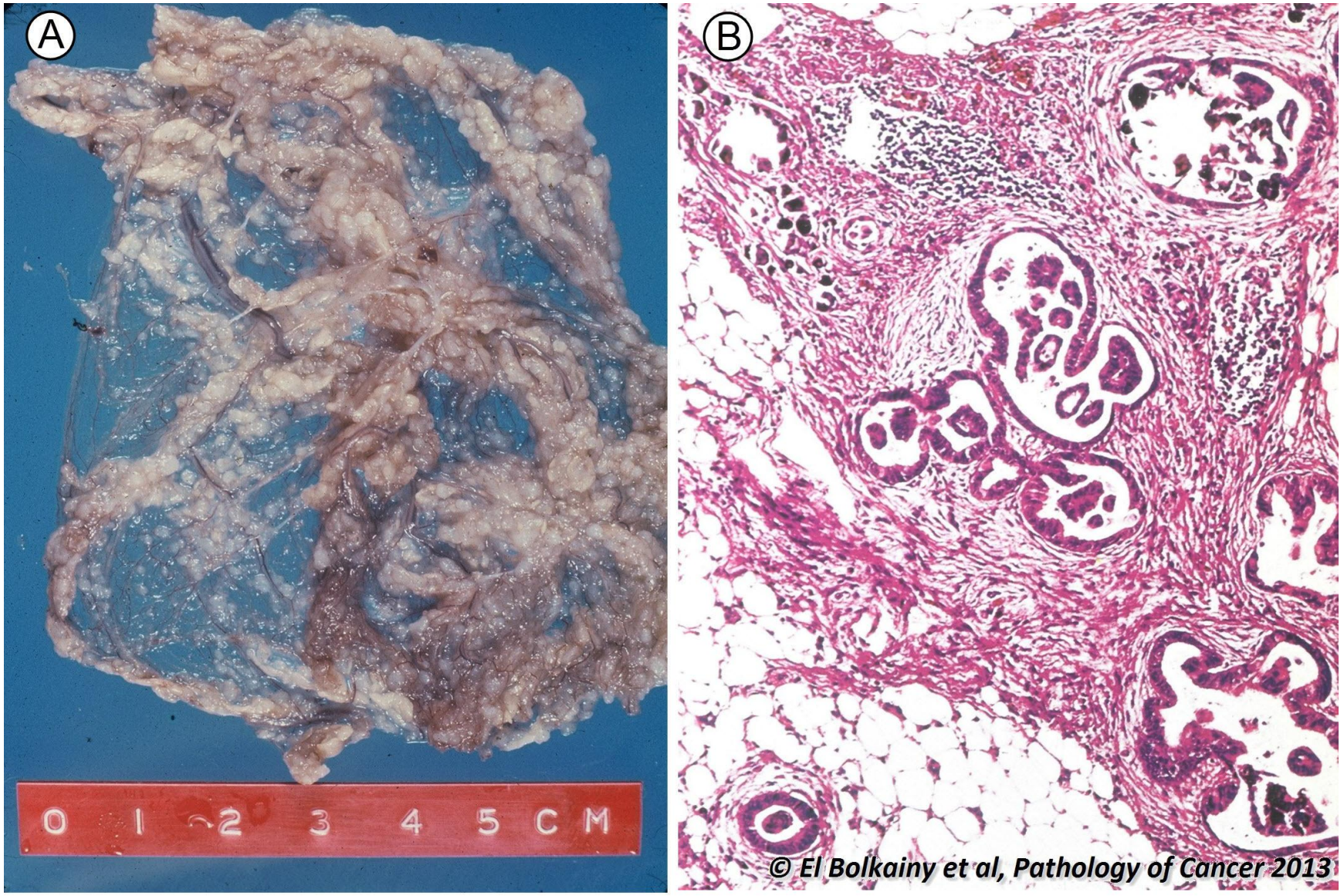
Picture 13-58 **Peritoneum, pseudomyxoma peritonei,low grade, histology. A** Acellular pools of mucin in the stroma, or **B** mucin containing few bland, mono-layered mucin secreting epithelium. These changes are usually associated with benign adenomas, commonly in appendix.

13.59 Peritoneum, pseudomyxoma peritonei, high grade, histology.



Picture 13-59 **Peritoneum, pseudomyxoma peritonei,high grade , histology. A** and **B** In addition to pools of mucin in the stroma, there are many malignant glands or signet-ring cells. These changes indicates malignant mucinous tumor in appendix, colon, gall bladder, pancreas or ovary.

13.60 Greater omentum, multiple metastases from colonic carcinoma.



Picture 13-60 **Greater omentum, multiple metastases from colonic carcinoma. A** Multiple small nodules, whitish and firm. **B** Histology, metastatic adenocarcinoma of colonic origin.