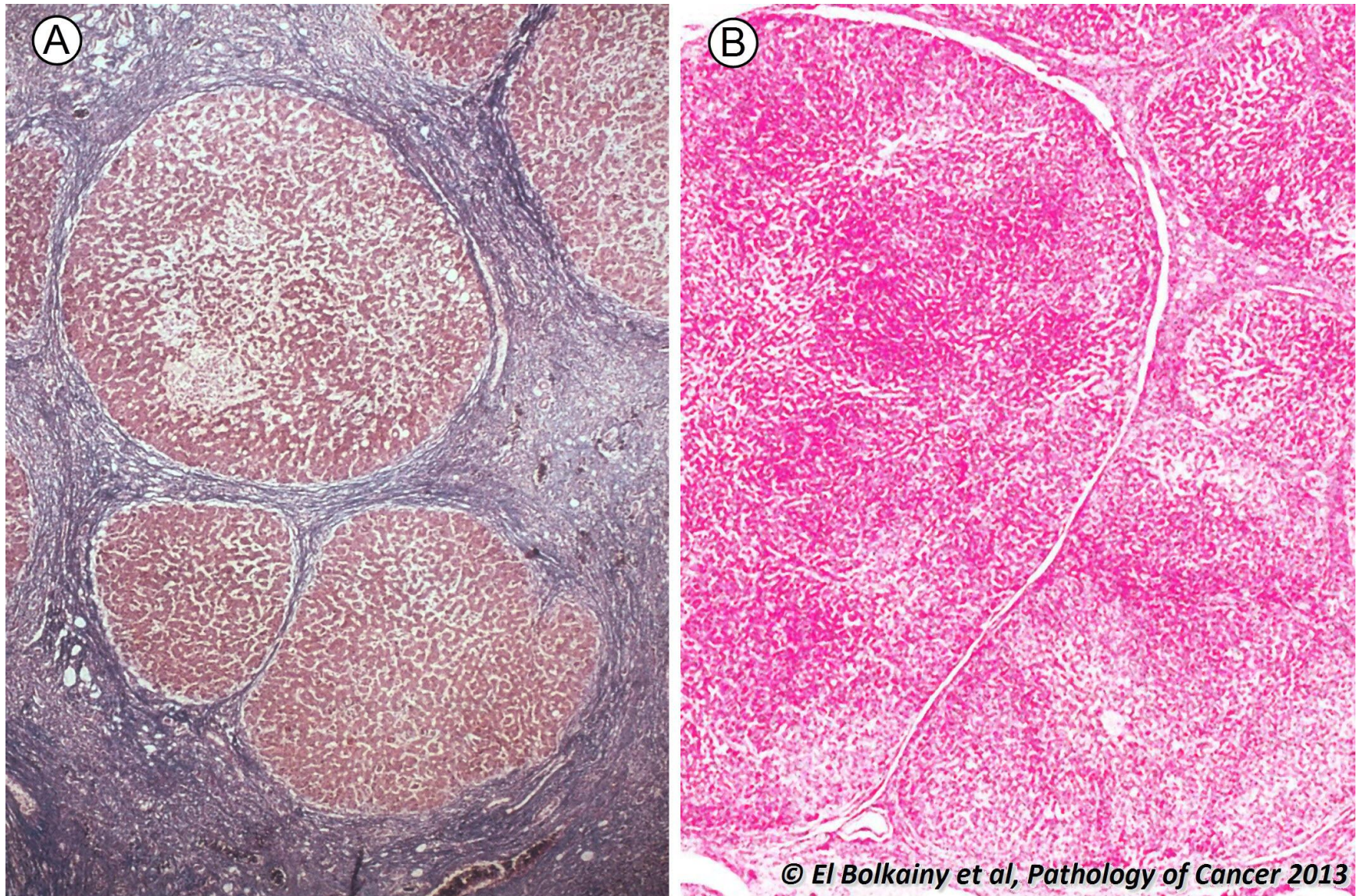


Chapter 14

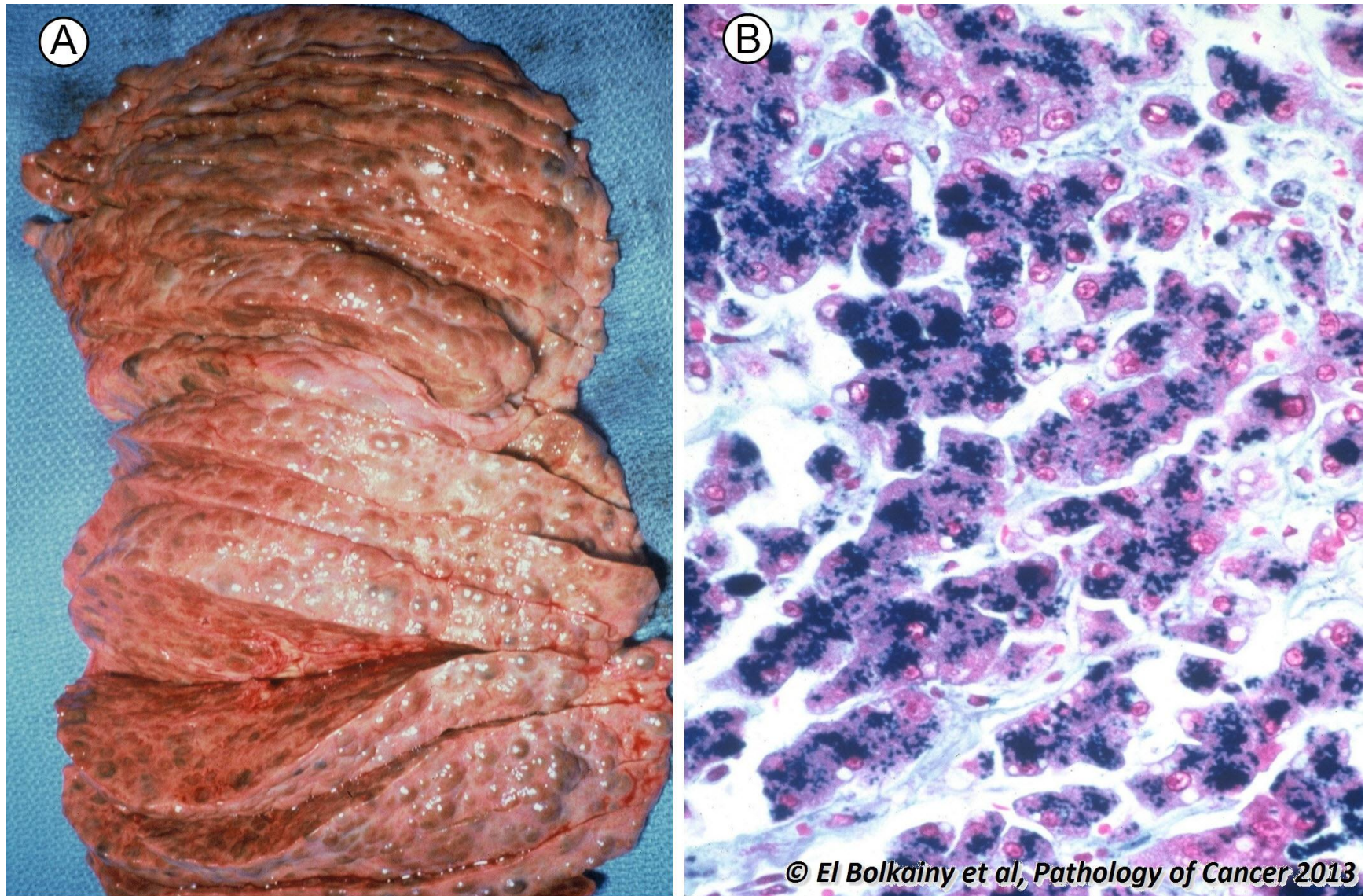
Hepatobiliary and pancreatic tumors

14.1 A virus-related cirrhosis, histology.



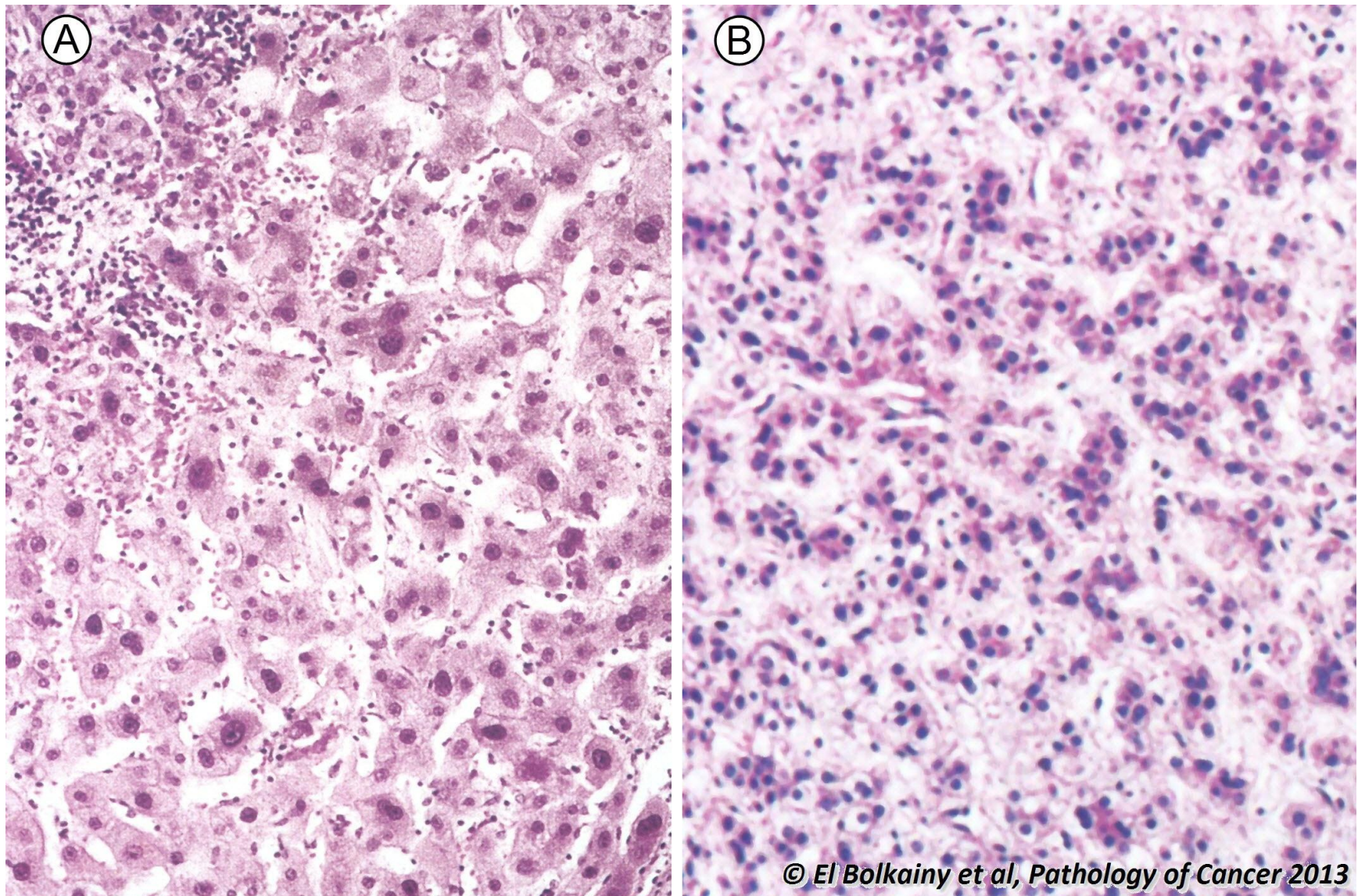
Picture 14-1 A virus-related cirrhosis, histology. **A** Microregenerative nodules, surrounded by fibrous tissue (blue colors), Masson trichrome stain. **B** Macroregenerative nodule associated with micronodular cirrhosis.

14.2 Hemochromatosis-associated liver cirrhosis.



Picture 14-2 Hemochromatosis-associated liver cirrhosis. **A** Gross appearance showing characteristic brownish color and micronodules of cirrhosis. **B** Histologically, the cytoplasm of hepatocytes are rich in hemosiderin pigment (Prussian blue stain).

14.3 Liver cell change (dysplasia), histology.



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Picture 14-3 Liver cell change (dysplasia), histology. **A** Large cell change, hepatocytes are large but with low N/C ratio. **B** Small cell change, hepatocytes are small, but, with high N/c ratio. The latter type has a high risk of progression to hepatocellular carcinoma.

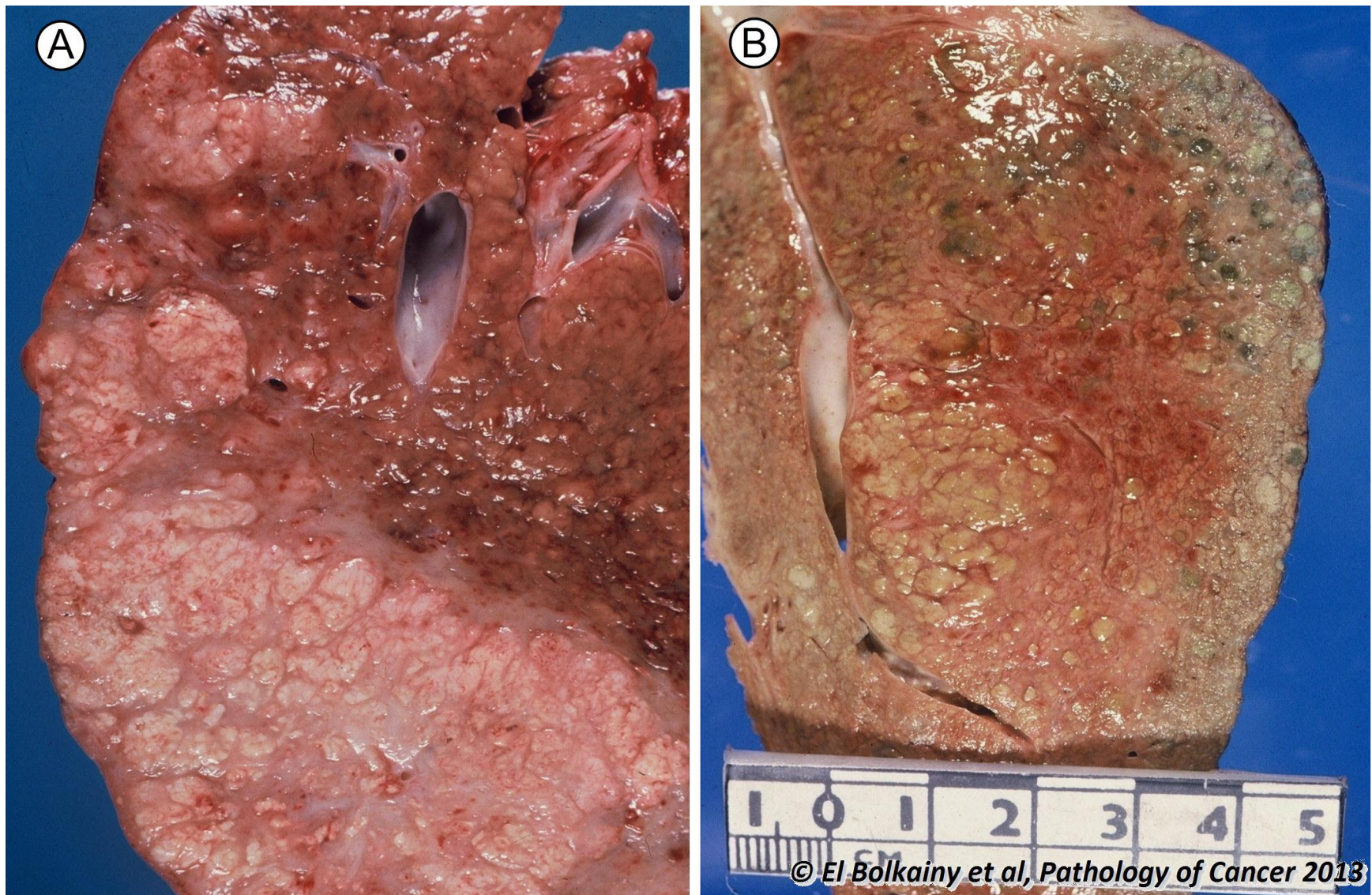
14.4 Hepatocellular carcinoma, gross features.



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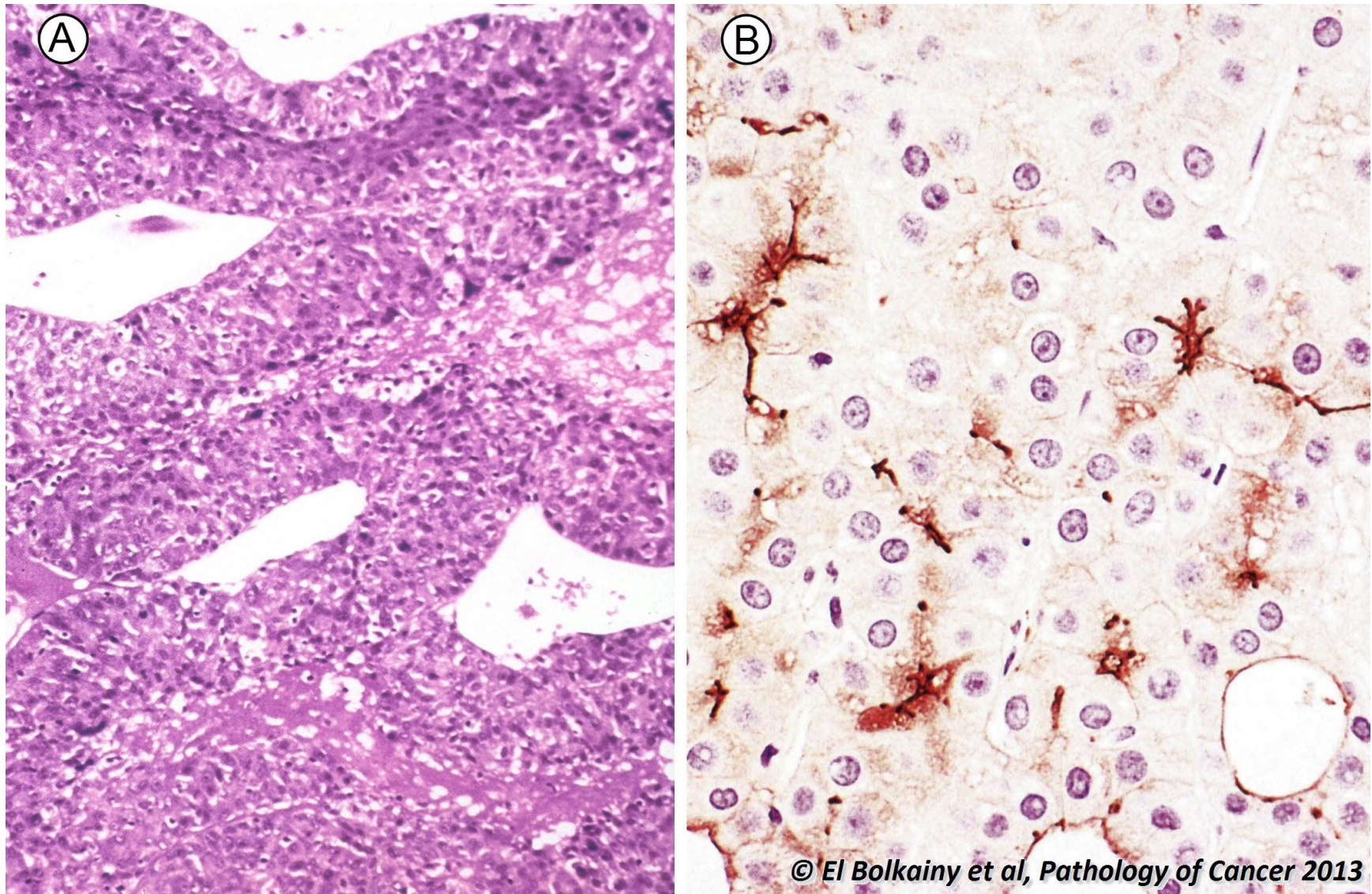
Picture 14-4 Hepatocellular carcinoma, gross features. A multinodular unifocal type, showing a nodule in a nodule pattern in the upper part of the tumor. The liver shows no cirrhosis.

14.5 Hepatocellular carcinoma, gross features.



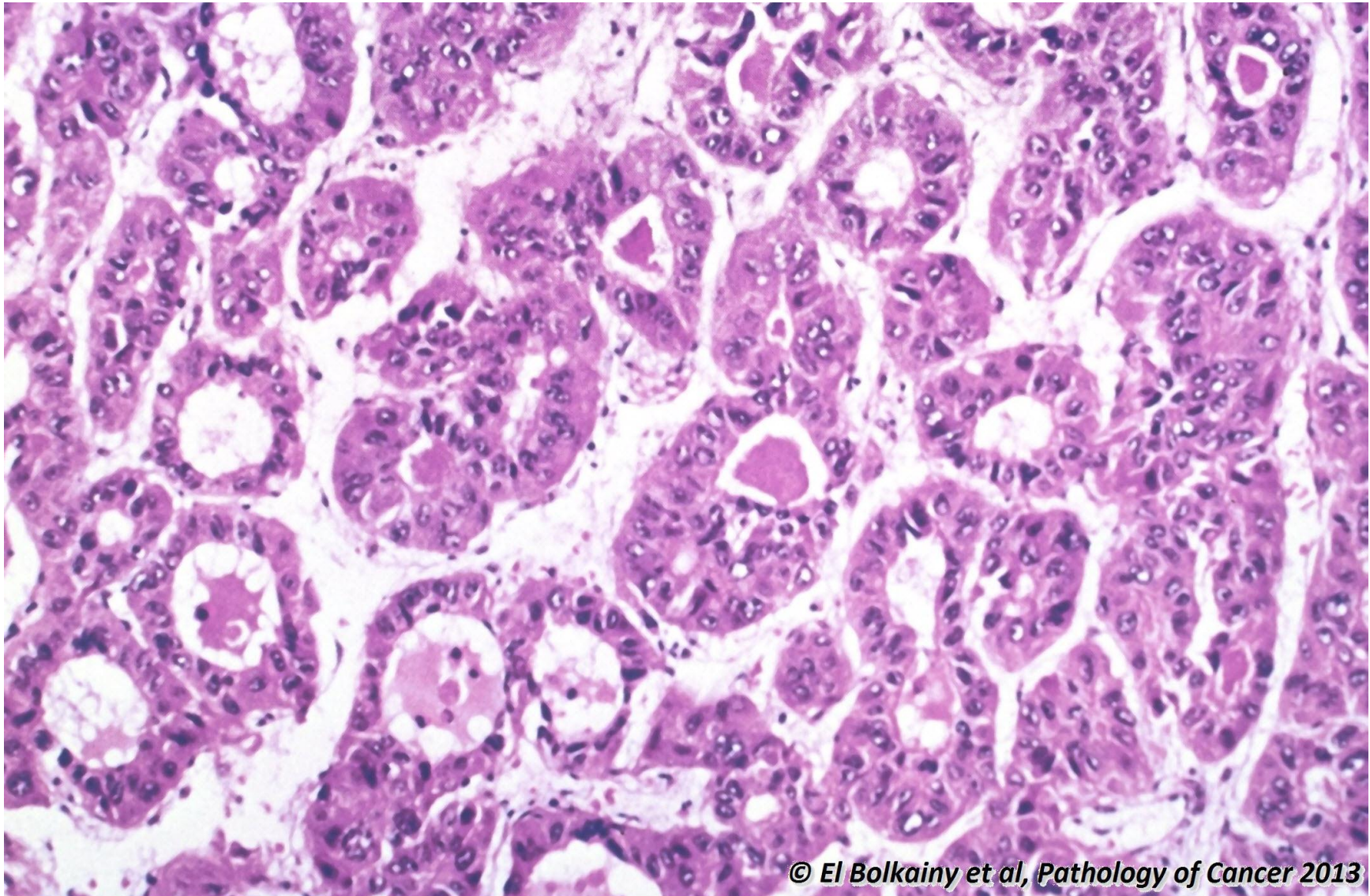
Picture 14-5 Hepatocellular carcinoma, gross features. A multicentric tumor showing tumor masses of variable size appearing paler than the surrounding liver tissue. There is associated macronodular cirrhosis **A**, and micronodular cirrhosis **B**.

14.6 Hepatocellular carcinoma, histology.



Picture 14-6 Hepatocellular carcinoma, histology. **A** Trabecular pattern composed of 3-5 cells in thickness and separated by sinusoids. Confirmatory immunostains: hepPar-1 & CEA. **B** Bile canaliculi are evident by polyclonal CEA immunostain.

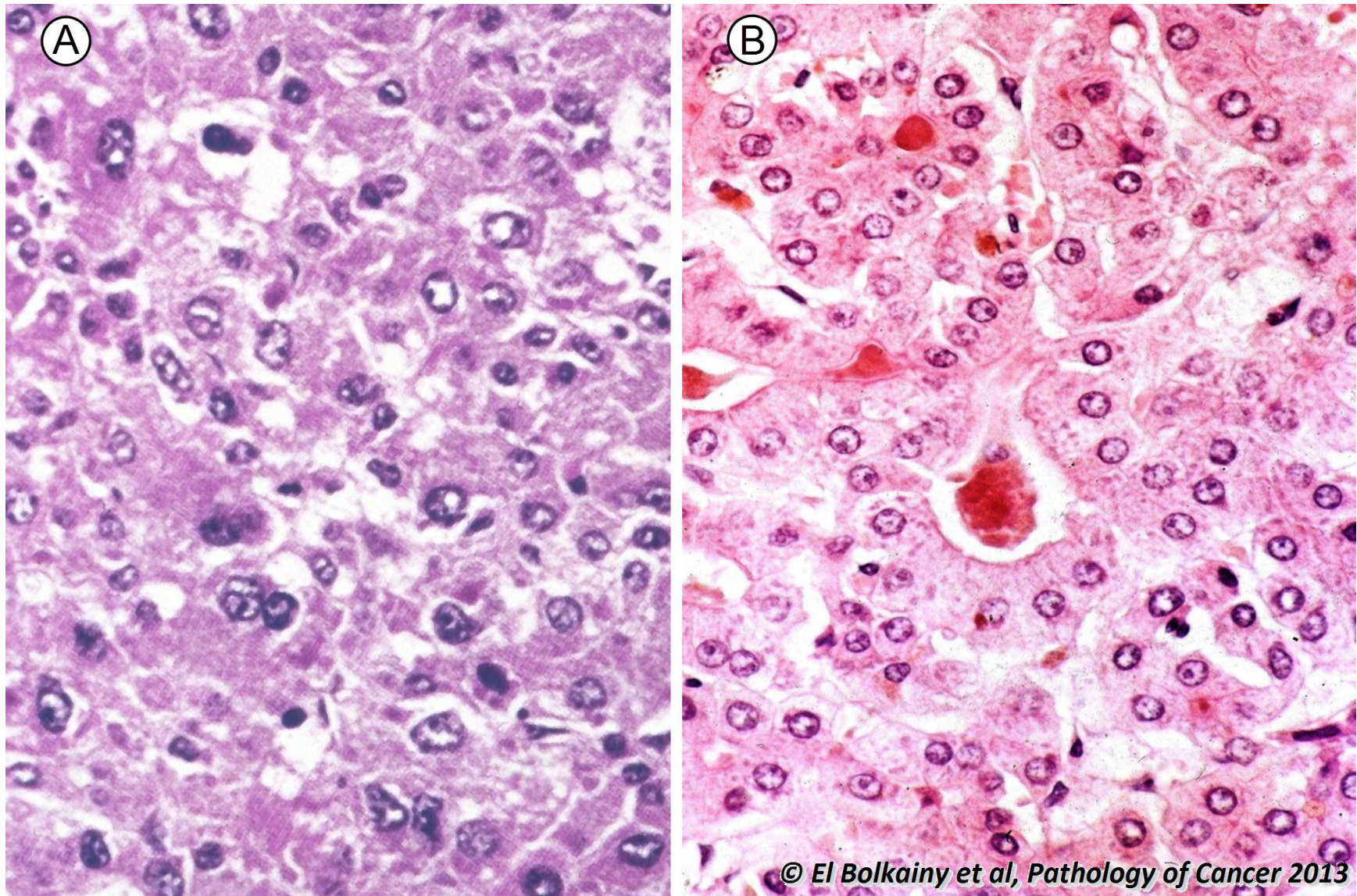
14.7 Hepatocellular carcinoma, histology.



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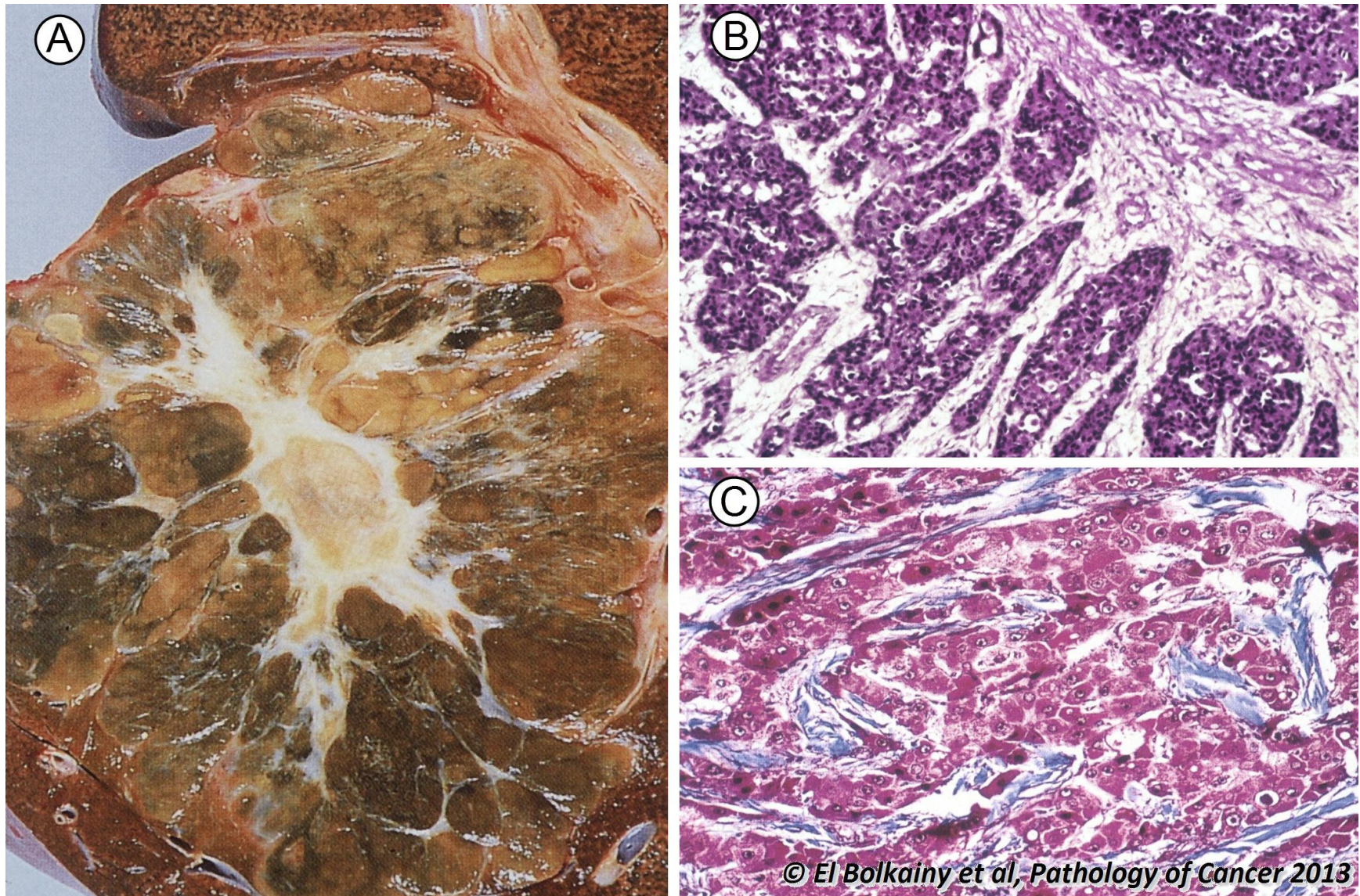
Picture 14-7 Hepatocellular carcinoma, histology. A predominantly acinar pattern. The abundant eosinophilic cytoplasm and bile content confirms the hepatocellular differentiation of tumor.

14.8 Hepatocellular carcinoma, histology.



Picture 14-8 Hepatocellular carcinoma, histology. **A** A predominantly solid pattern of hepatocytes. **B** A pseudoacinus containing bile in the lumen with a smaller bile canaliculi in the upper part of the picture.

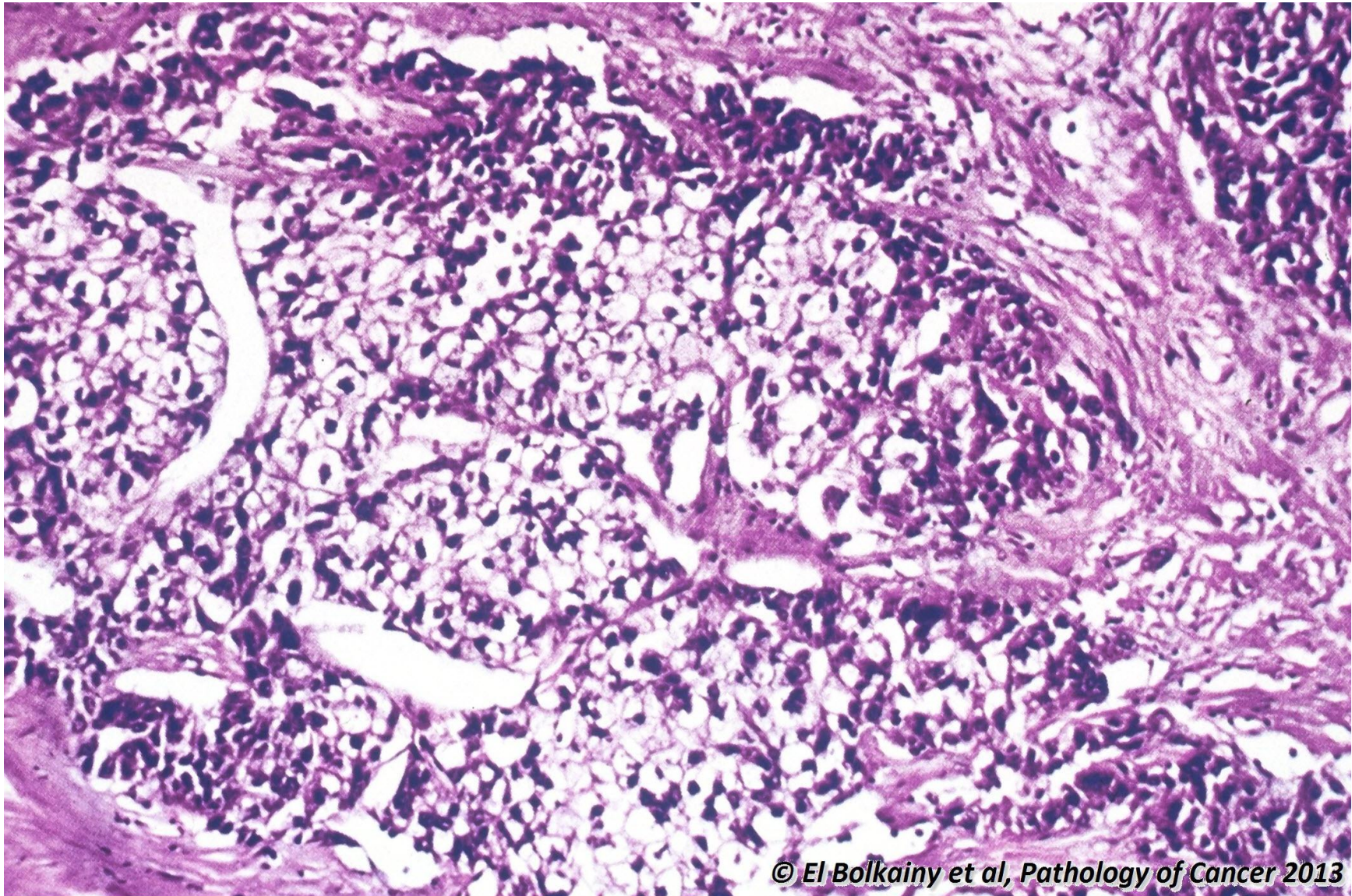
14.9 Hepatocellular carcinoma, fibrolamellar variant.



Picture 14-9

Hepatocellular carcinoma, fibrolamellar variant. A Grossly, it shows central stellate scar and non-cirrhotic liver. B and C Histology shows insular (islands) pattern in a fibrotic stroma. Prognosis is more favorable

14.10 Hepatocellular carcinoma, histology.

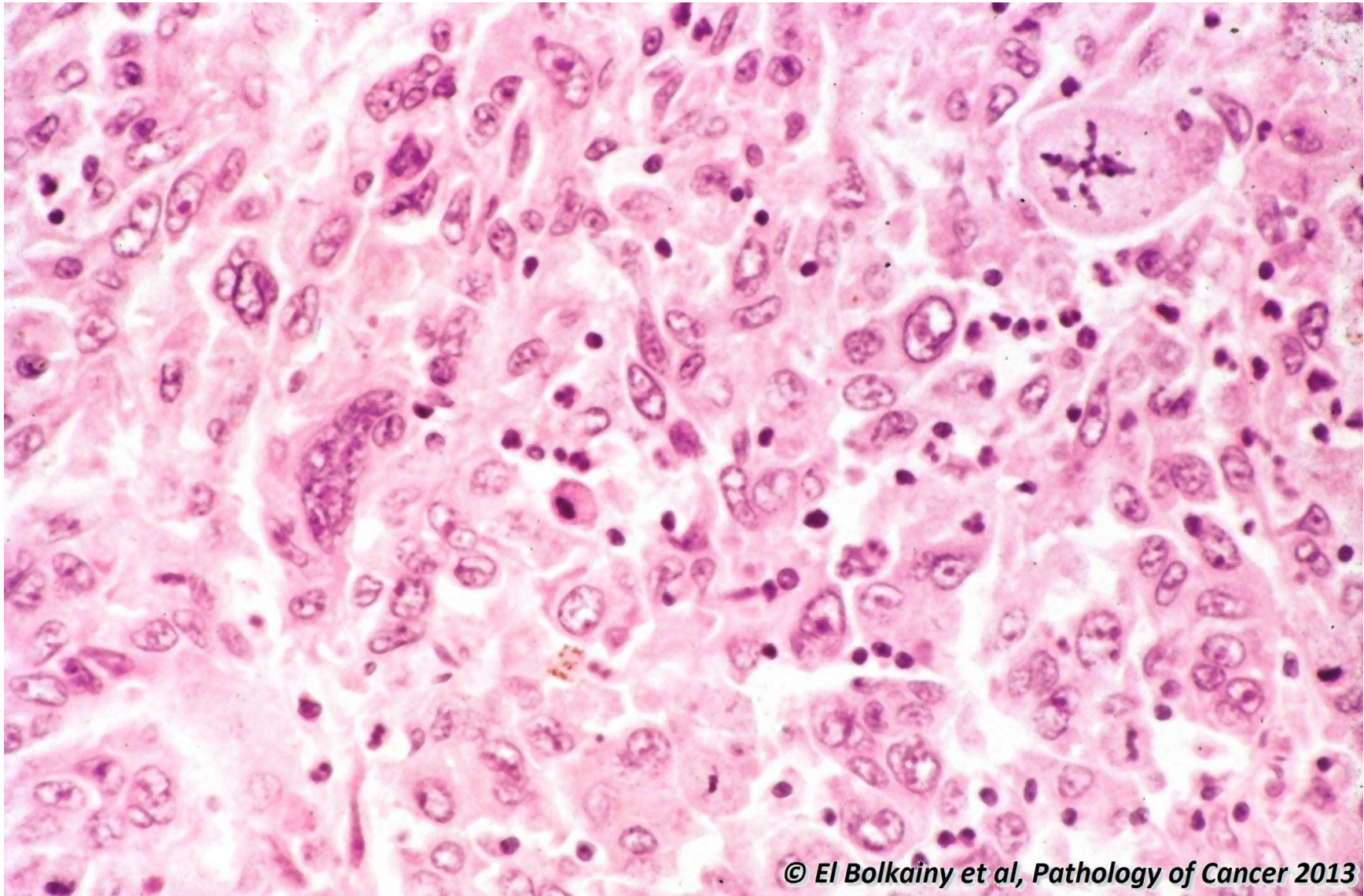


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**Picture
14-10**

Hepatocellular carcinoma, histology. The clear cell variant is due to high cytoplasmic glycogen. It must not be misdiagnosed as metastatic clear cell carcinoma.

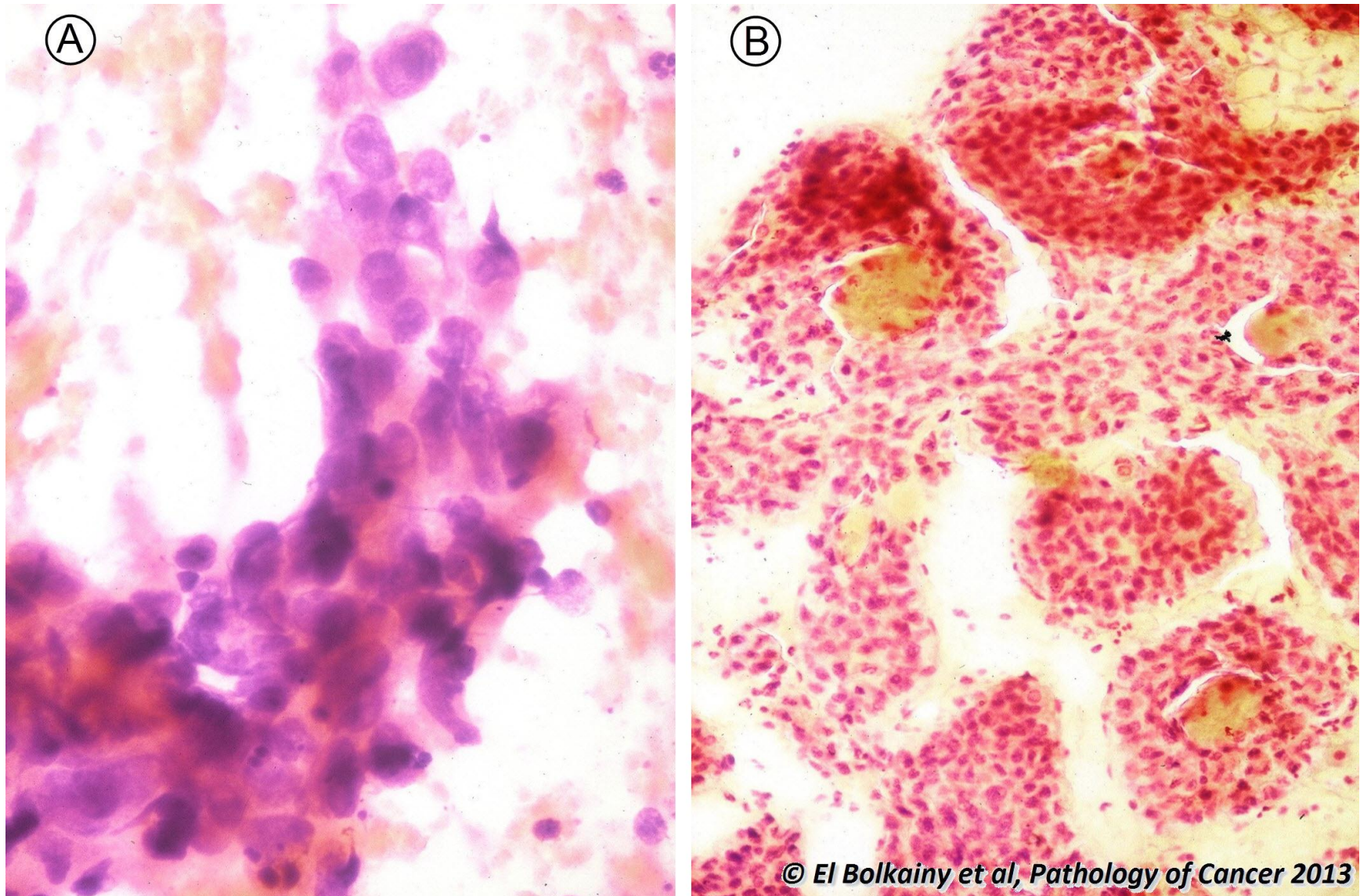
14.11 Hepatocellular carcinoma, histology.



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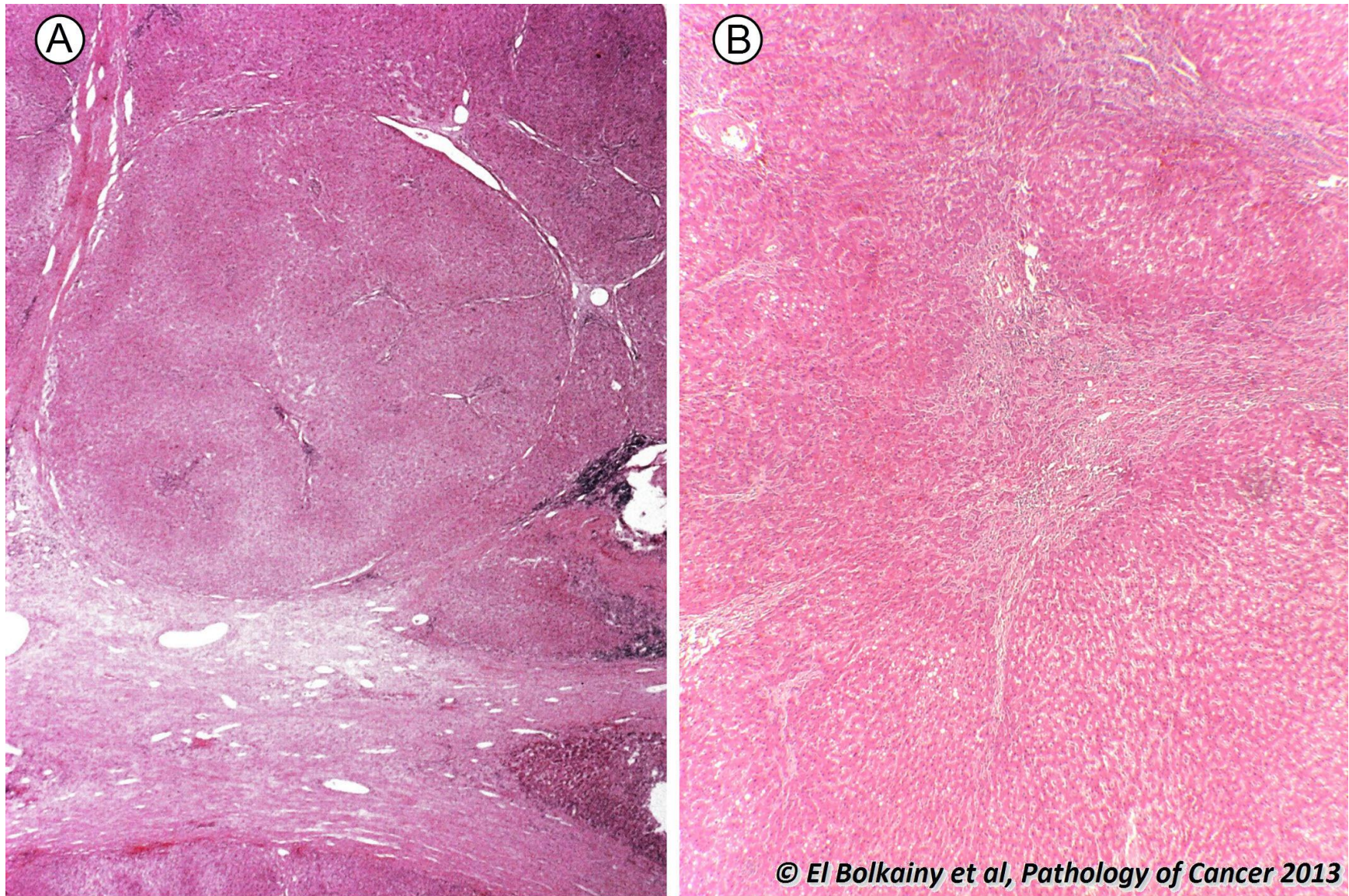
Picture 14-11 Hepatocellular carcinoma, histology. A Pleomorphic type showing variation of hepatocyte size and shape, with pleomorphic nuclei and abnormal mitotic figure.

14.12 Hepatocellular carcinoma, fine needle aspiration cytology.



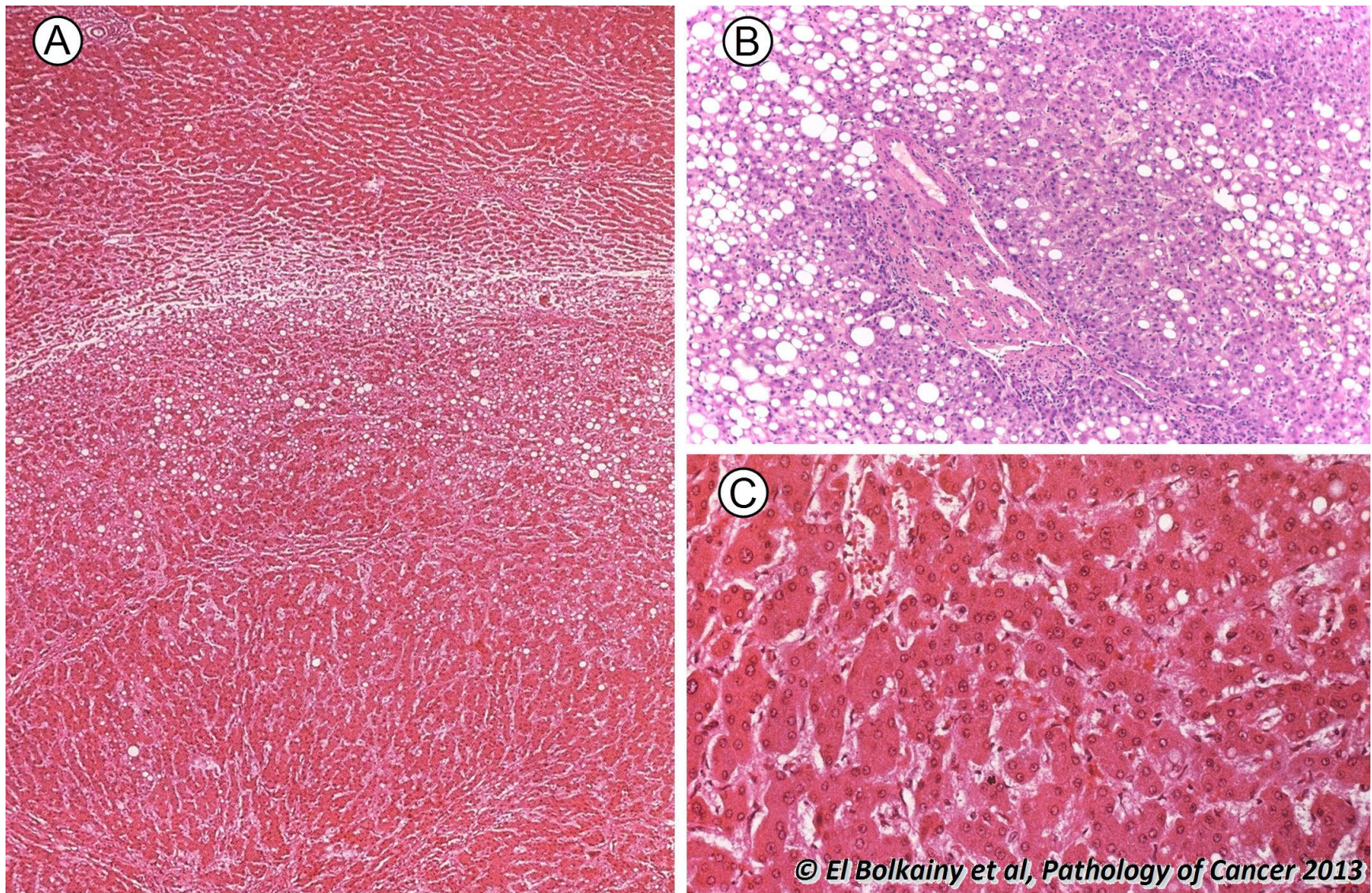
Picture 14-12 Hepatocellular carcinoma, fine needle aspiration cytology. **A** A characteristic trabecular pattern with large hepatocytes and increased N/C ratio. **B** Trabeculae show the intervening sinusoids as well as the greenish bile.

14.13 Focal nodular hyperplasia, histology.



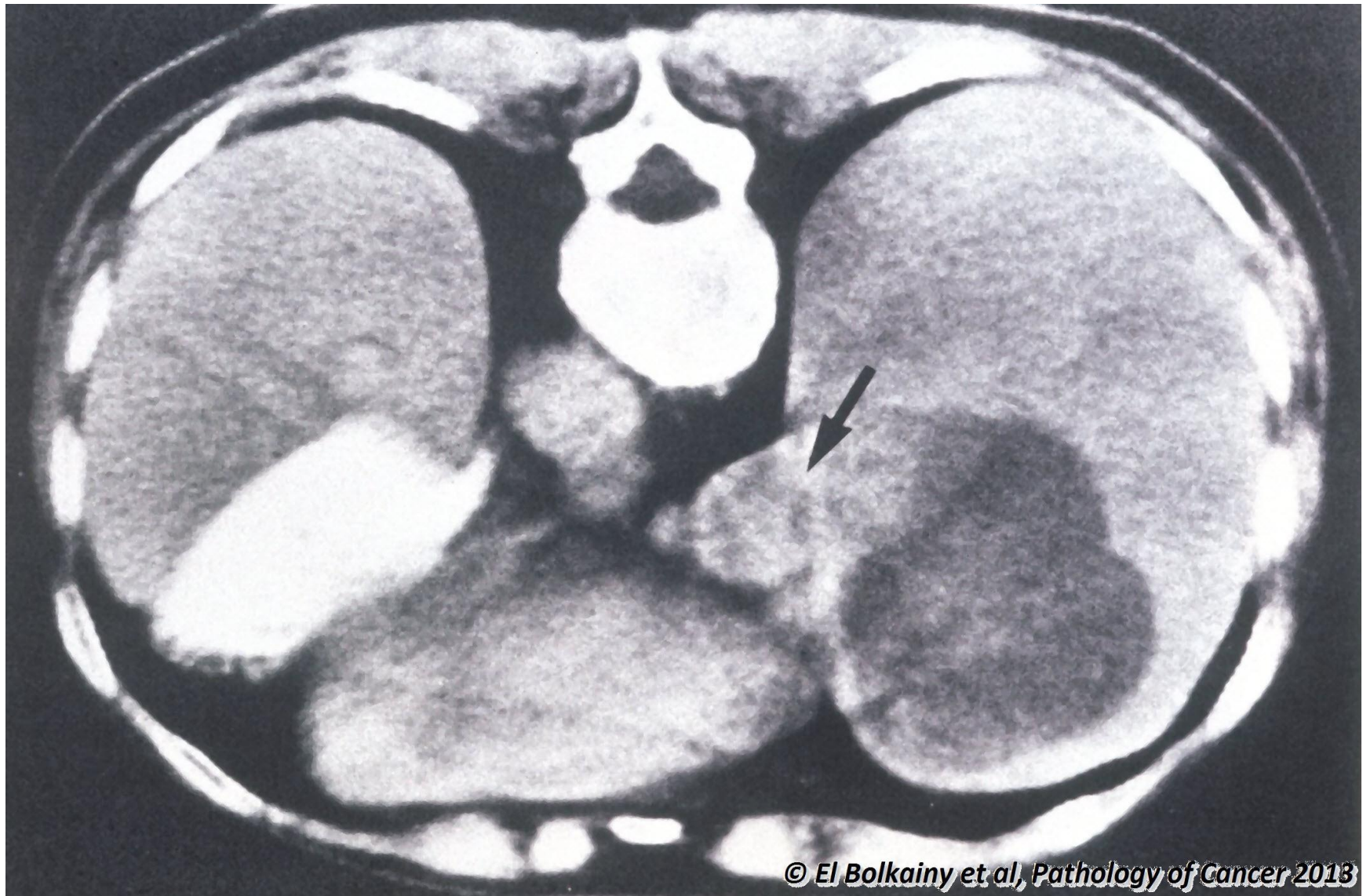
Picture 14-13 Focal nodular hyperplasia, histology. **A** Low power shows a central stellate scar containing blood vessels. **B** High power shows a preserved lobular pattern.

14.14 Liver adenoma, histology.



Picture 14-14 Liver adenoma, histology. Hepatocytes are arranged in sheets with lack of portal tracts or bile ducts. The hepatocytes are rich in glycogen, well-differentiated with absence of mitoses. **A** Low power. **B** and **C** High power.

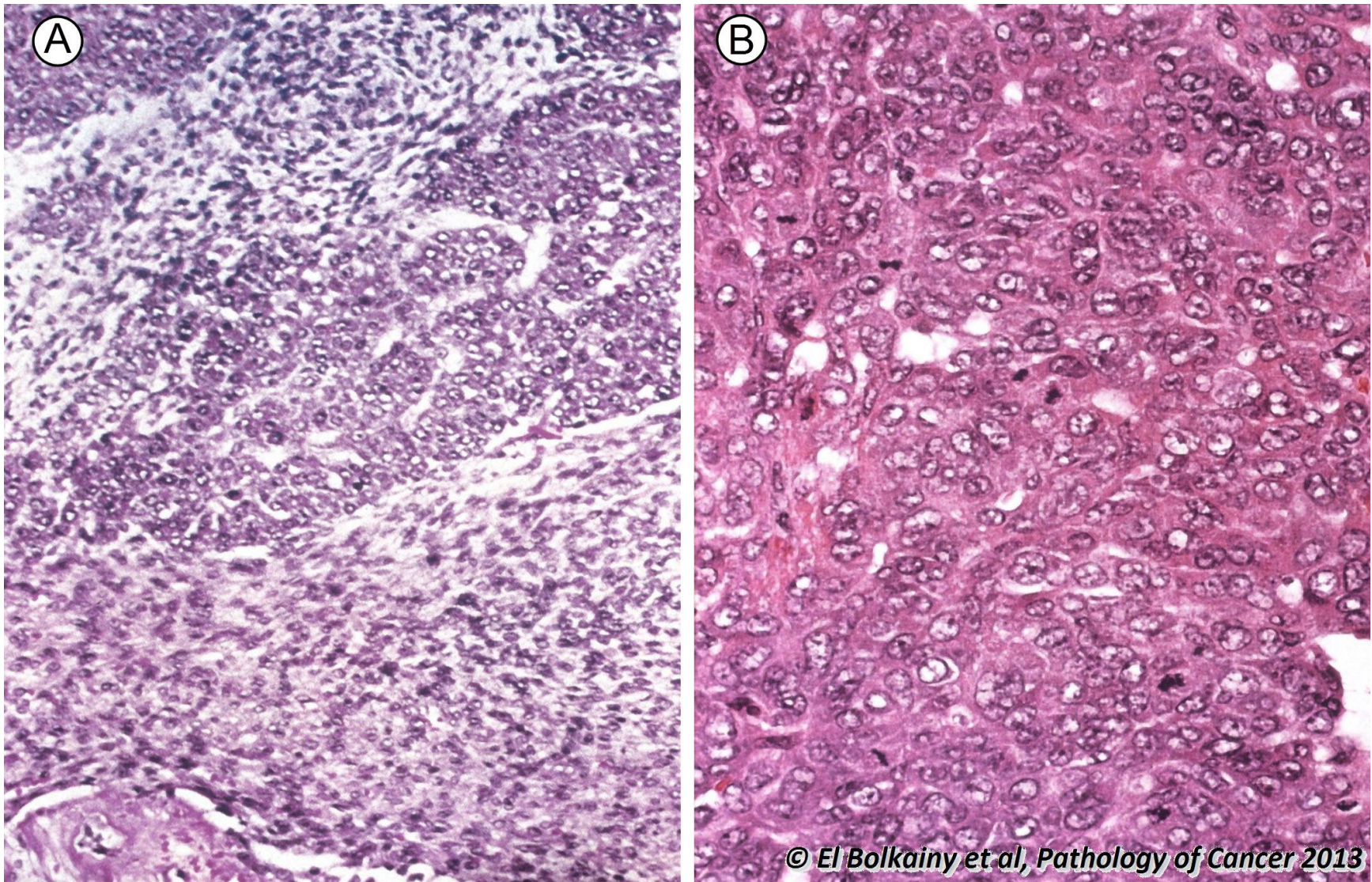
14.15 Hepatocellular carcinoma, CT image,



**Picture
14-15**

Hepatocellular carcinoma, CT image, a workup for staging. There is invasion of hepatic vein (stage III) (arrow).

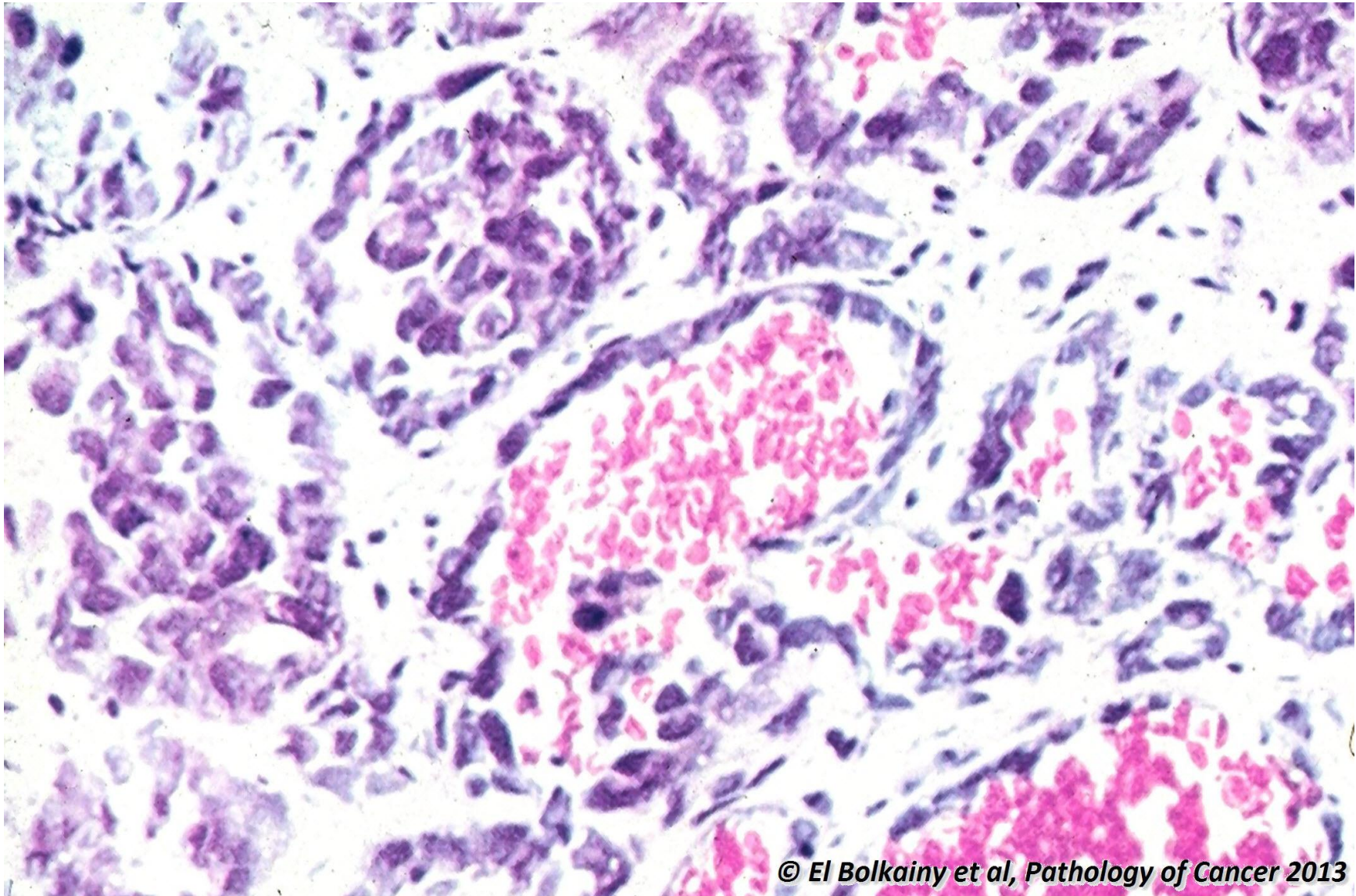
14.16 Hepatoblastoma, histology.



Picture 14-16

Hepatoblastoma, histology. Fetal subtype (most favorable) is composed of polygonal and cuboidal cells arranged in a trabecular pattern and showing alternating pale areas (glycogen and lipid rich) with dark areas. Tumor cells are immunoreactive to alpha- feto-protein (α FP)) and (β -catenin). **A** Low power. **B** High power. Other subtypes (not shown) are the embryonal, undifferentiated small and the mixed epithelial and mesenchymal cell.

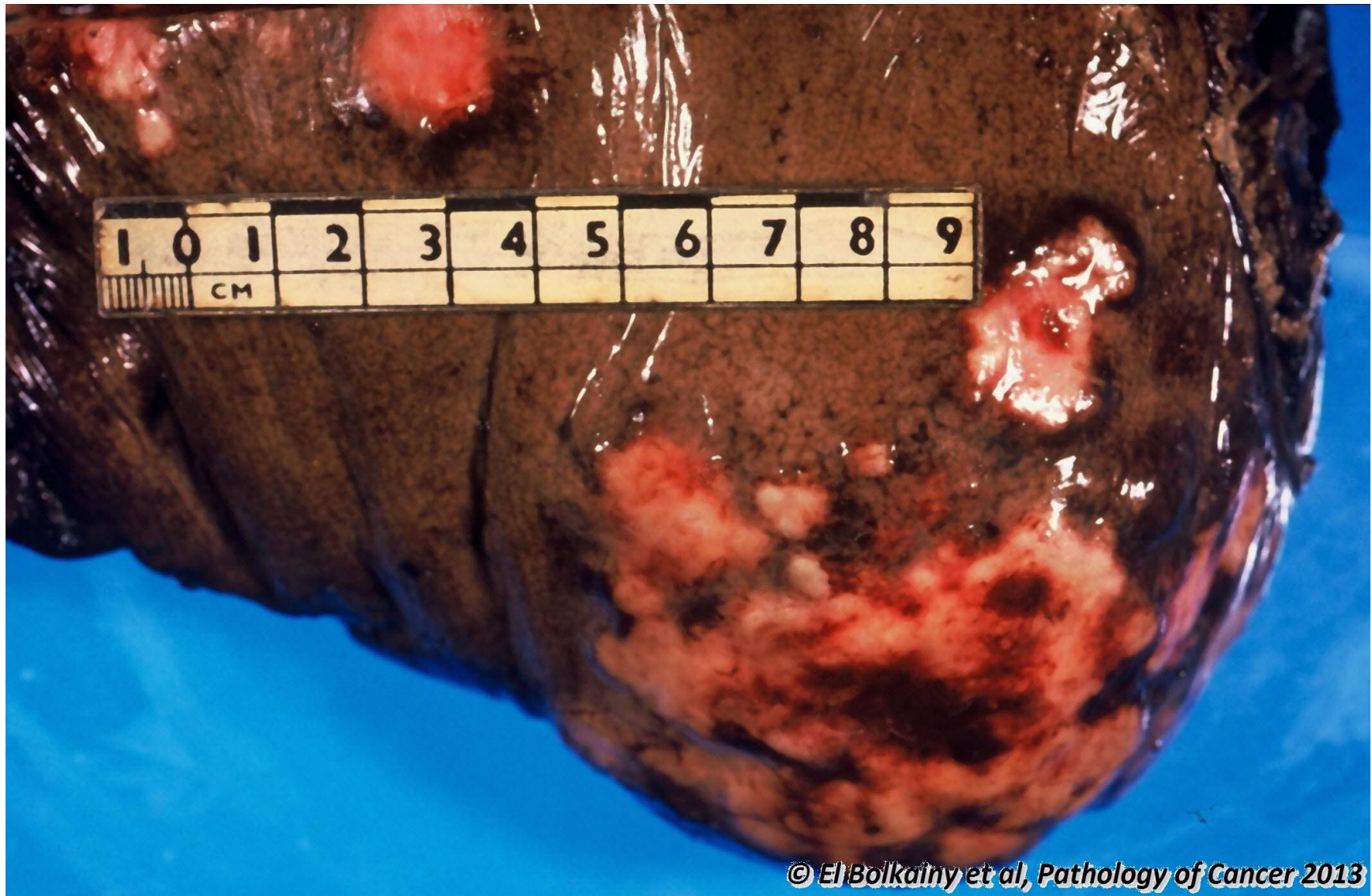
14.17 Hepatic angiosarcoma, histology.



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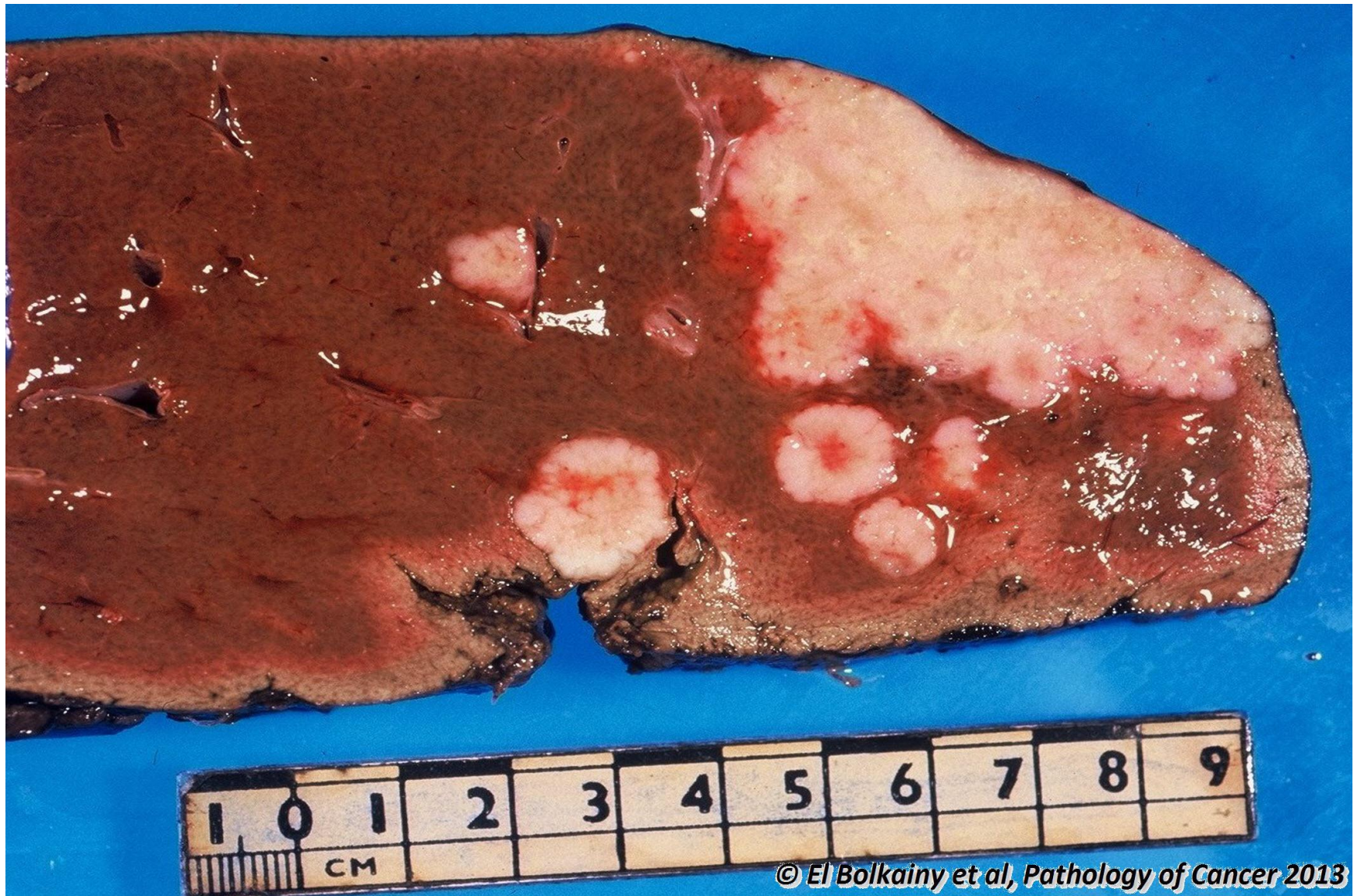
Picture 14-17 Hepatic angiosarcoma, histology. A malignant vasoformative tumor lined by pleomorphic endothelial cells with hyperchromatic nuclei, immunoreactive to CD34+.

14.18 Liver metastases from gastric carcinoma, gross surface view.



Picture 14-18 Liver metastases from gastric carcinoma, gross surface view. Note multiplicity of secondary tumors with umbilicated (depressed) surface of nodules due to necrosis and shrinkage.

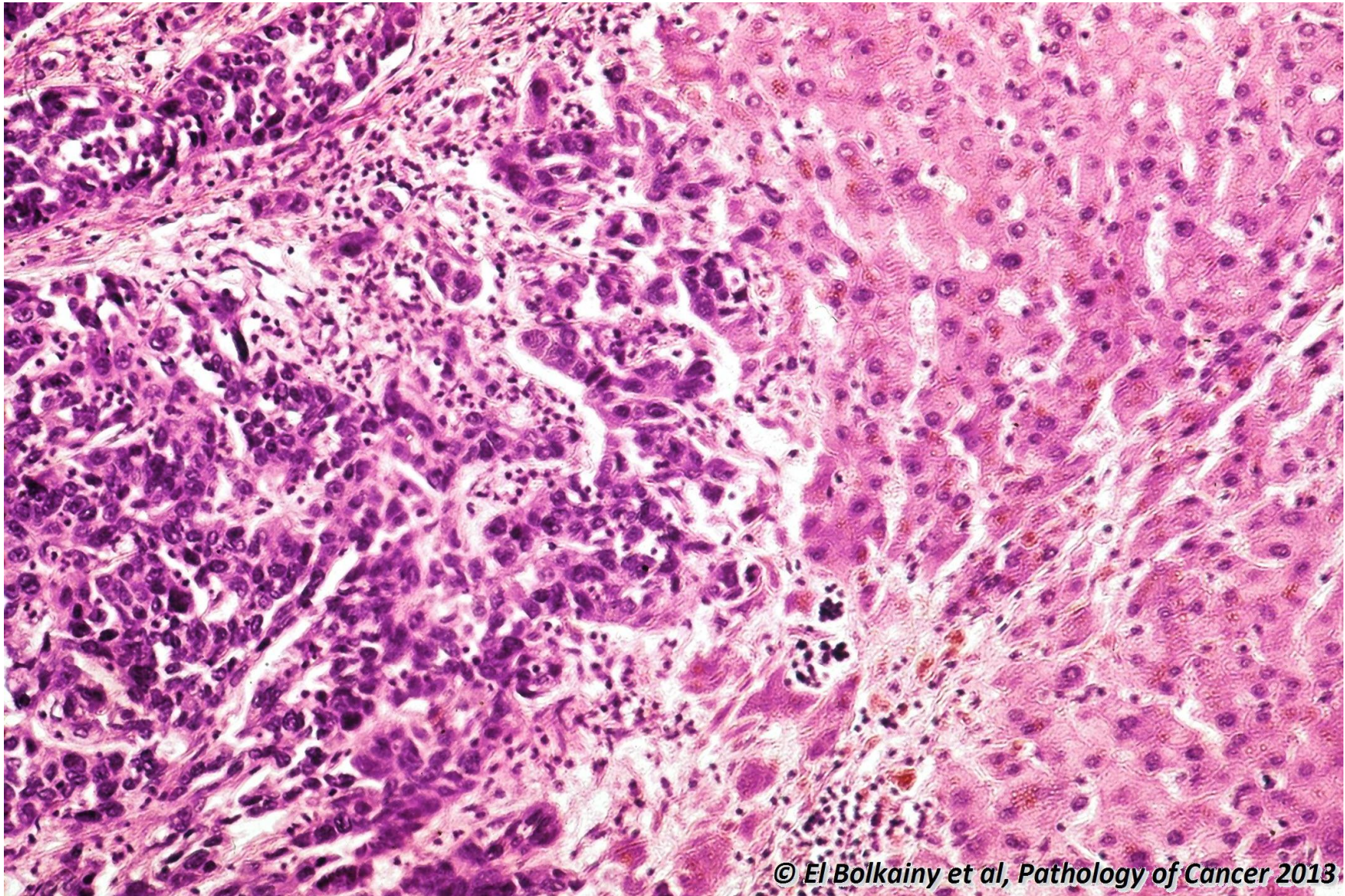
14.19 Liver metastases from gastric carcinoma, gross view of the cut section.



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Picture 14-19 Liver metastases from gastric carcinoma, gross view of the cut section. Note multiplicity, necrosis and umbilication of metastatic nodules.

14.20 Liver metastases from pancreatic carcinoma, histology.

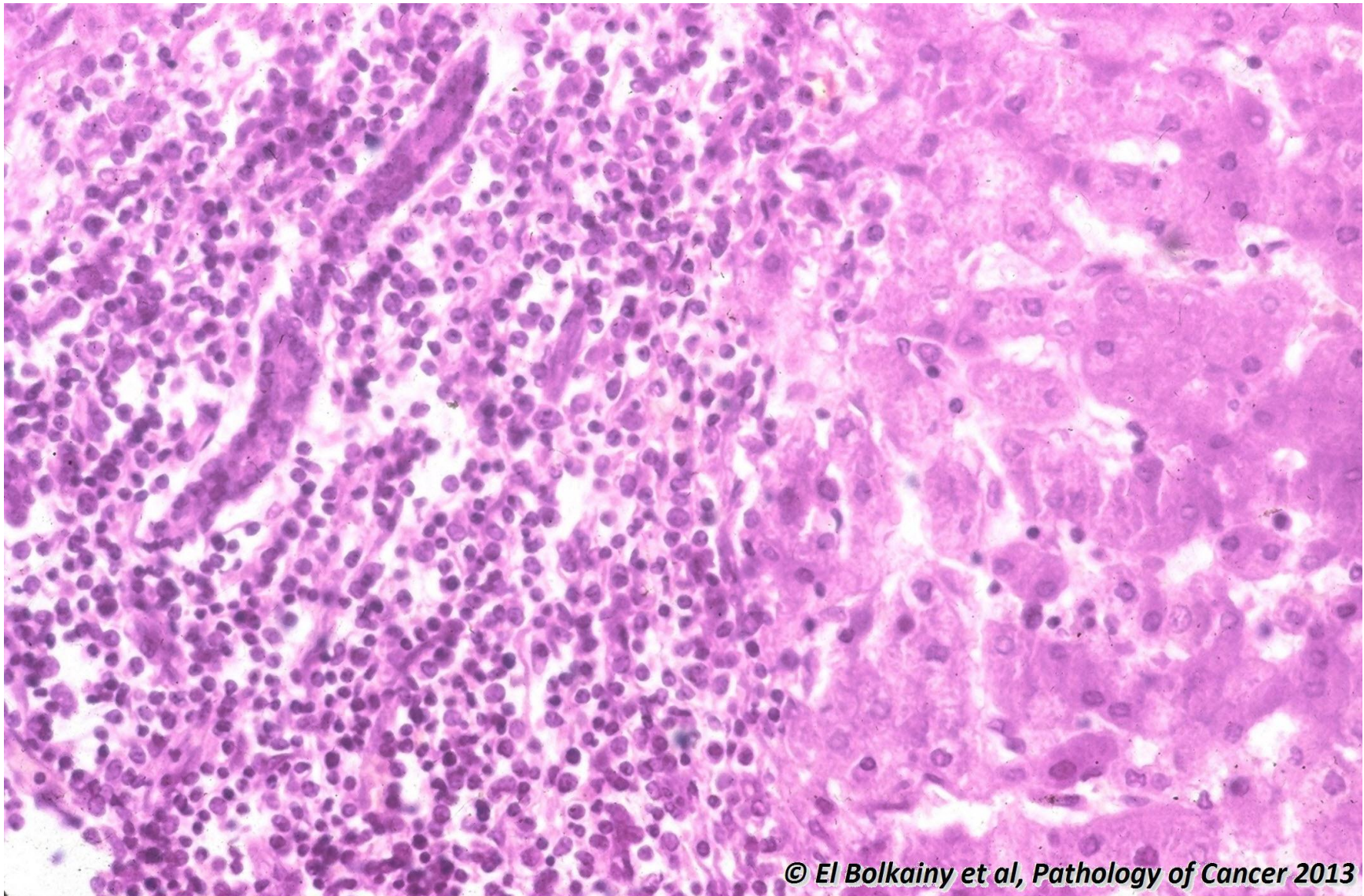


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**Picture
14-20**

Liver metastases from pancreatic carcinoma, histology. Note that the malignant ducts with desmoplasia are impossible to distinguish from intrahepatic cholangiocarcinoma (even by using immunostains). CT of pancreas is the only way to make this distinction.

14.21 Liver infiltrate by chronic lymphocytic leukemia (CLL), histology.



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**Picture
14-21**

Liver infiltrate by chronic lymphocytic leukemia (CLL), histology. There is dense small lymphocytic infiltrate in portal tracts (immunoreactive to LCA and CD 20). Small lymphocytic lymphoma and small cell lung cancer also produce a similar pattern of infiltration.

14.22 Carcinoma of gall bladder, gross features.



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Picture 14-22 Carcinoma of gall bladder, gross features. A mass lesion infiltrating the entire wall of gall bladder, associated with regional lymph node and omental metastases.

14.23 Carcinoma of the cystic duct associated with mucocele of the gall bladder.

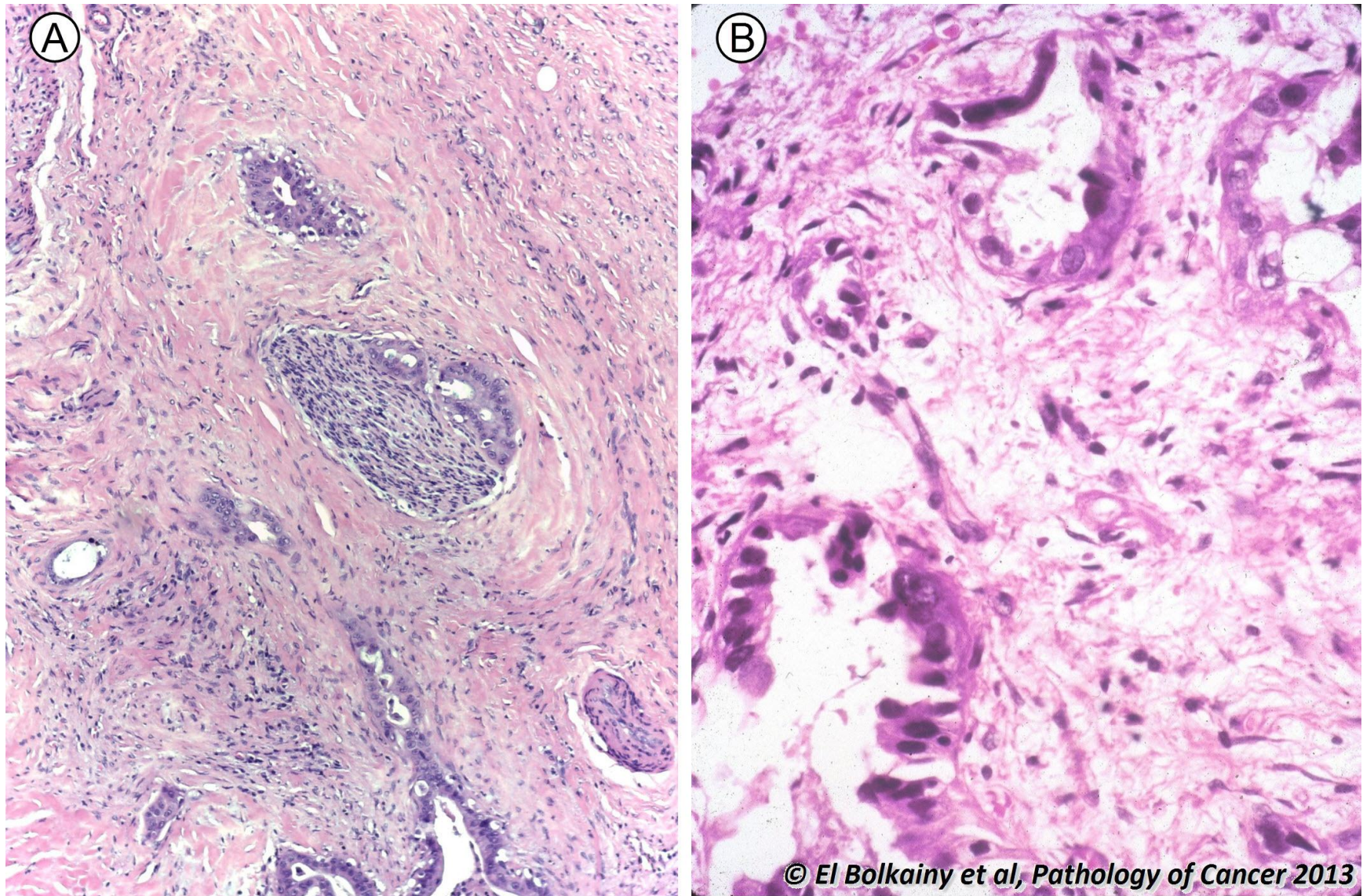


**Picture
14-23**

Carcinoma of the cystic duct associated with mucocele of the gall bladder. A small stenosing carcinoma of the cystic duct, results in obstruction and distension of gall bladder with mucin. Rupture will result in pseudomyxoma peritonei.

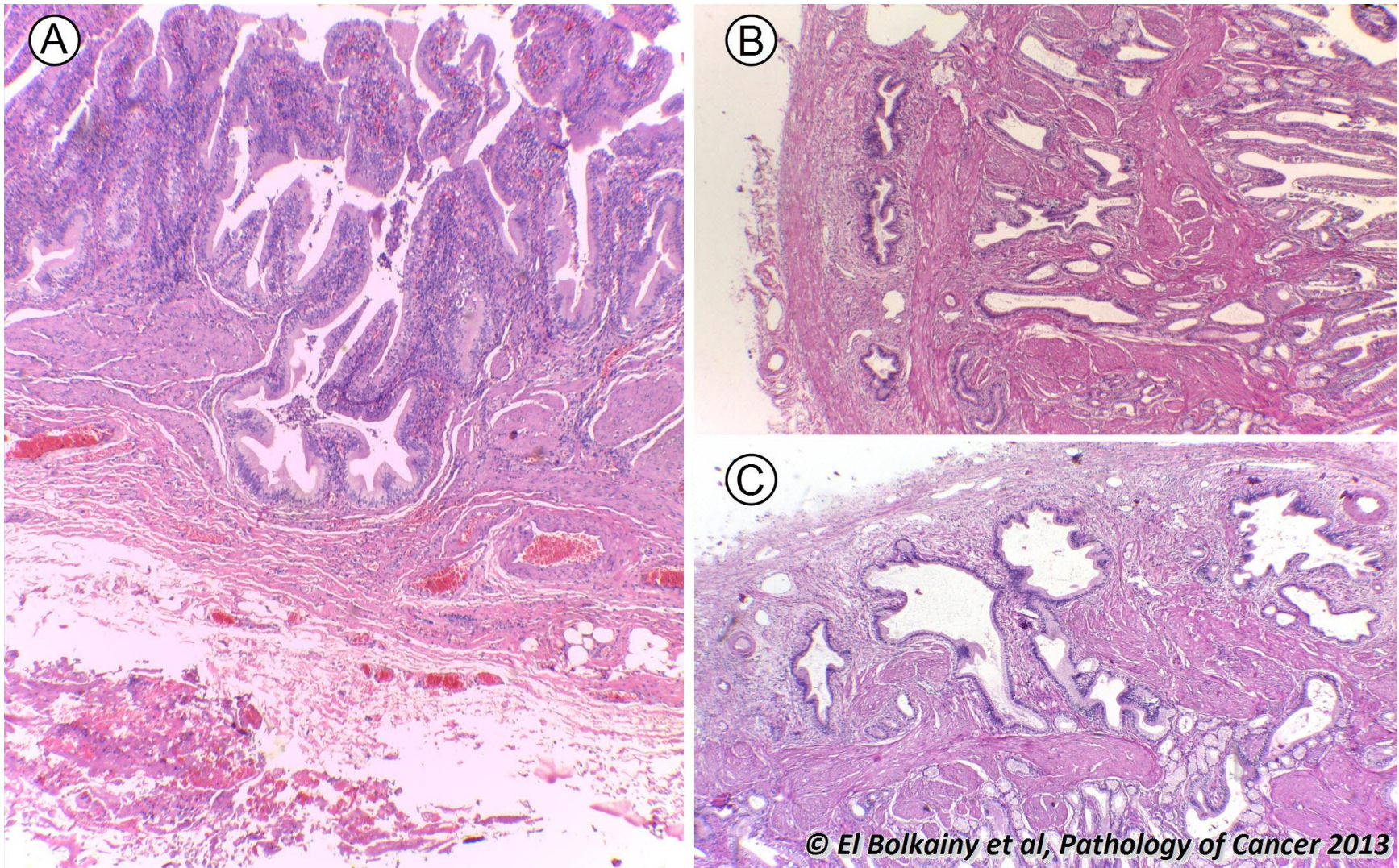
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14.24 Adenocarcinoma of gall bladder, histology.



Picture 14-24 Adenocarcinoma of gall bladder, histology. Irregular invasive glands vary in size and shape and lined by stratified columnar epithelium with active mitosis. (Immunoreactive to CK7 and CK19). **A** Low power. **B** High power.

14.25 Rokitansky- Aschoff sinuses of the gall bladder, histology.



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**Picture
14-25**

Rokitansky- Aschoff sinuses of the gall bladder, histology. **A** These are crypts of mucosa communicating with the lumen of bladder, are thought to represent diverticulae resulting from increased intraluminal pressure. **B** The sinuses are penetrating inbetween muscle layers. **C** Sinuses reach up to subserosa. They must not be misdiagnosed as adenocarcinoma. The crypts are lined by a single layer of normal epithelium which communicates with the lumen.

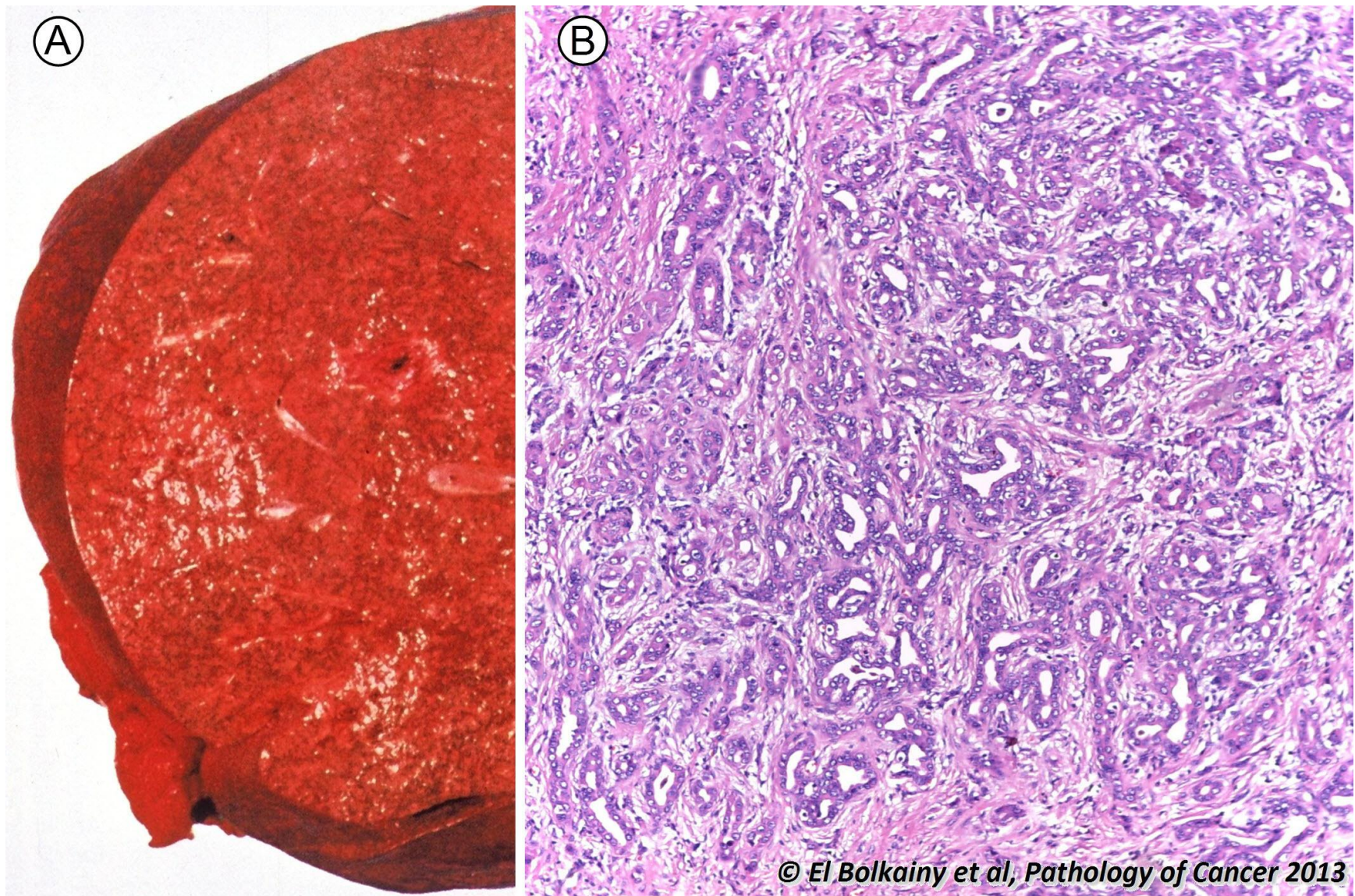
14.26 Cholecystitis glandularis proliferans, gross features.



Picture 14-26 Cholecystitis glandularis proliferans, gross features. This may complicate chronic cholecystitis. The gall bladder wall is thickened by fibrosis and contains multiple cysts and diverticulæ, producing a tumor-like lesion.

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14.27 Intrahepatic cholangiocarcinoma.

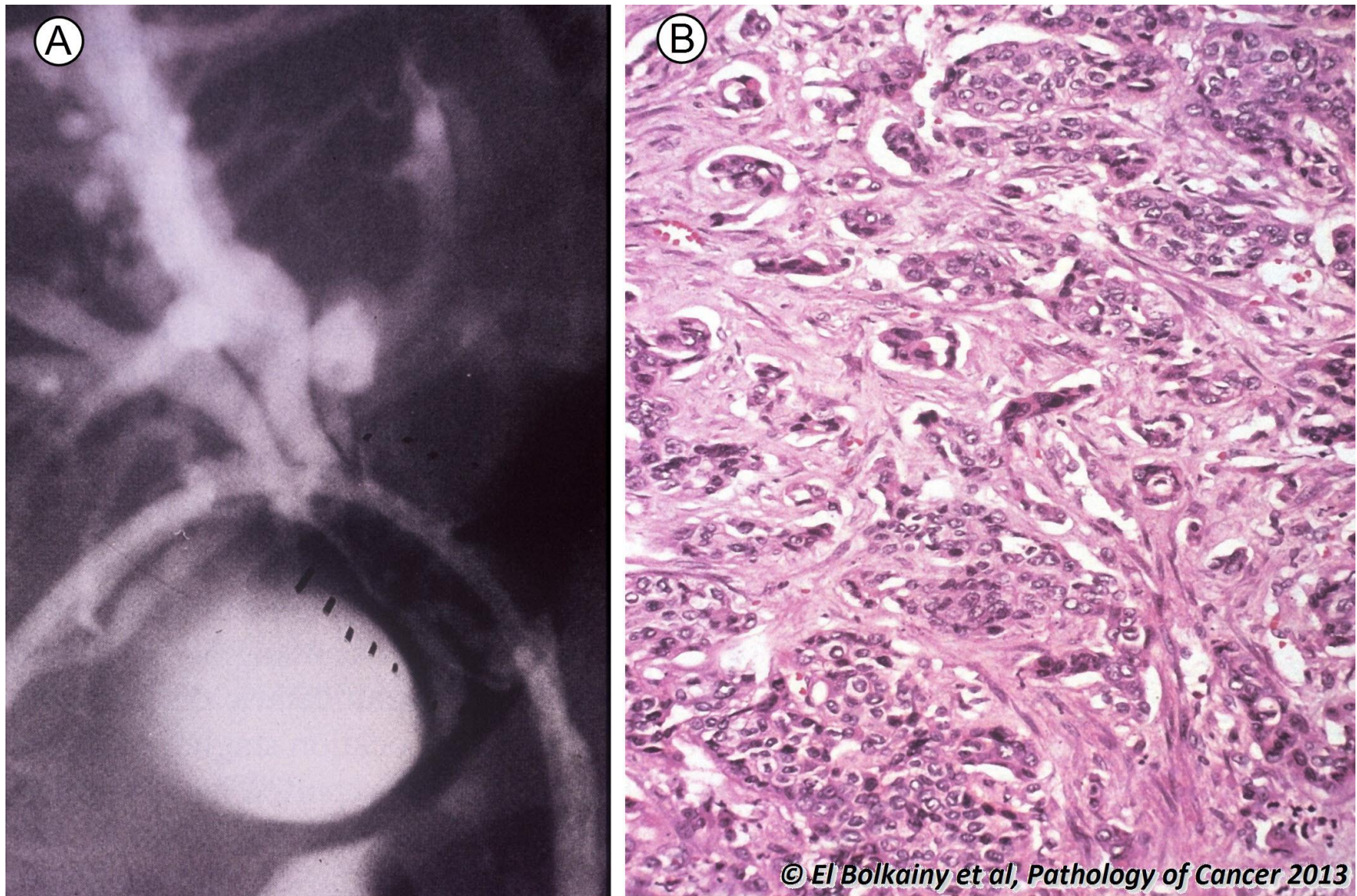


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Picture 14-27

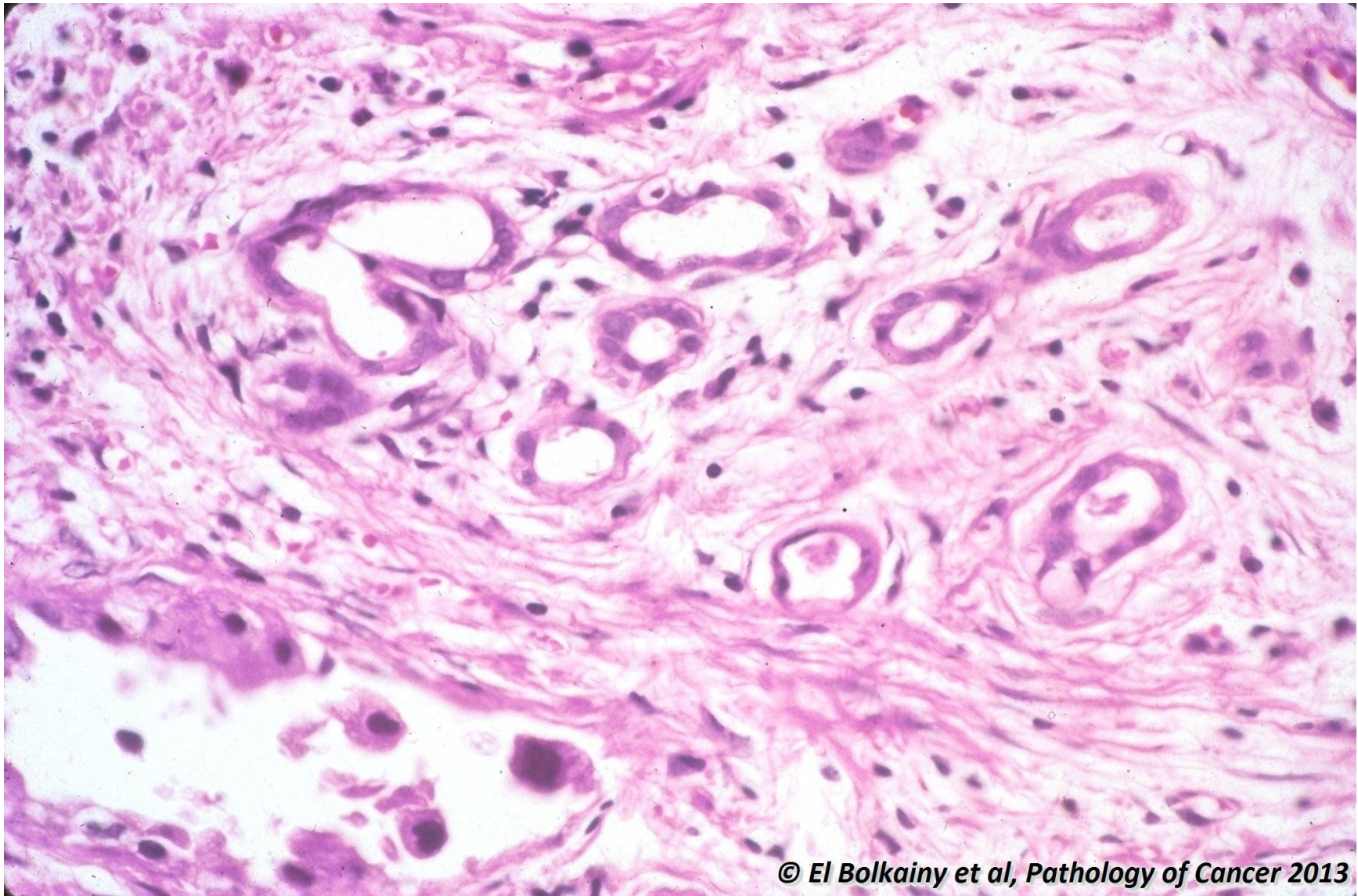
Intrahepatic cholangiocarcinoma. **A** Grossly a large tumor mass appear paler than the rest of liver. **B** Histology shows invasive adenocarcinoma, easily distinguished from hepatocellular carcinoma but impossible to differentiate from gastrointestinal metastases due to common marker profile (CEA, Moc-31 and CK7)

14.28 Hilar cholangiocarcinoma (Klatiskin tumor).



Picture 14-28 Hilar cholangiocarcinoma (Klatiskin tumor). **A** Cholangiogram showing a malignant stricture causing dilatation of proximal ducts. **B** Histology showing an invasive adenocarcinoma with ductal pattern.

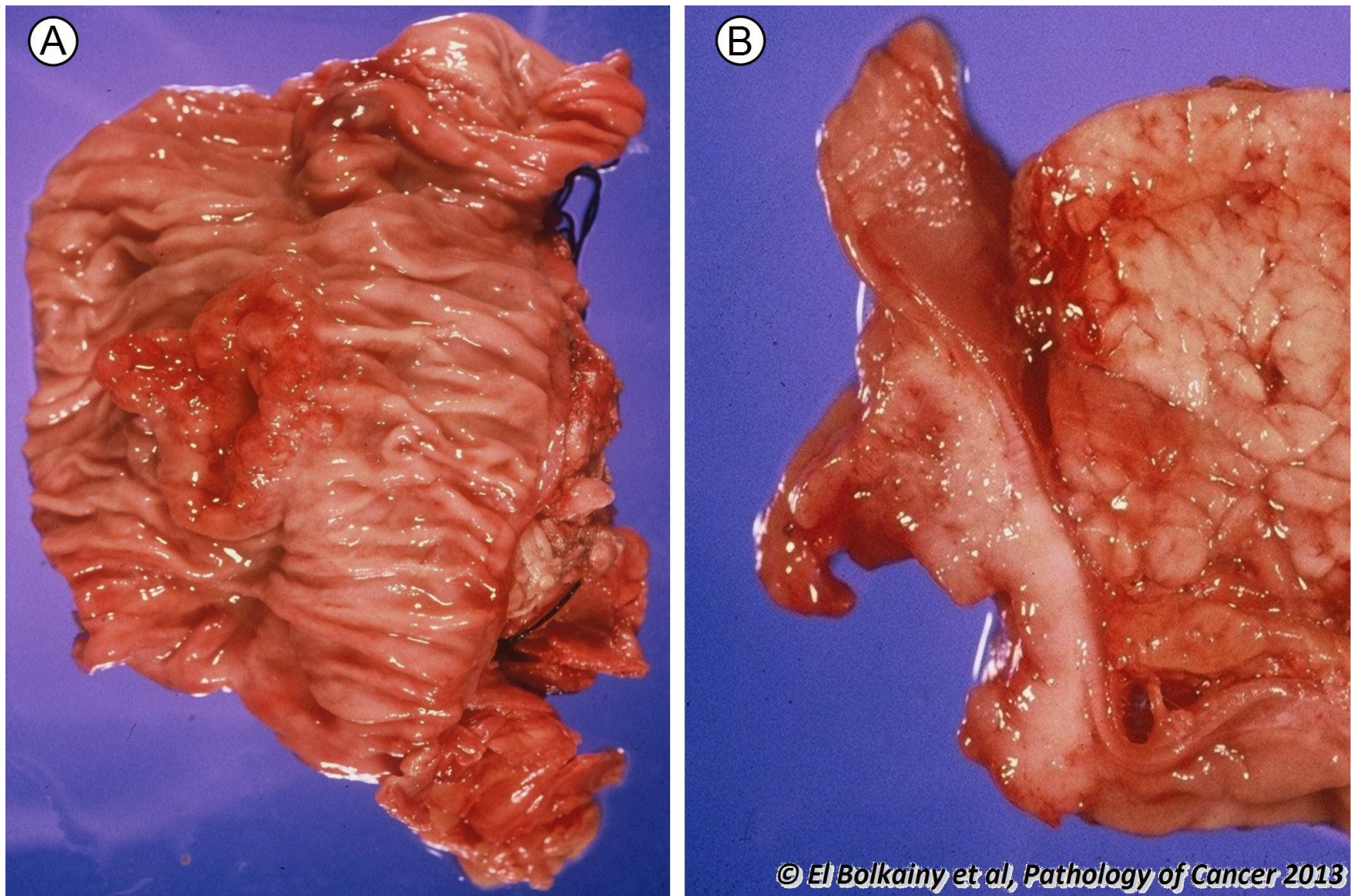
14.29 Hilar cholangiocarcinoma (Klatiskin tumor), histology.



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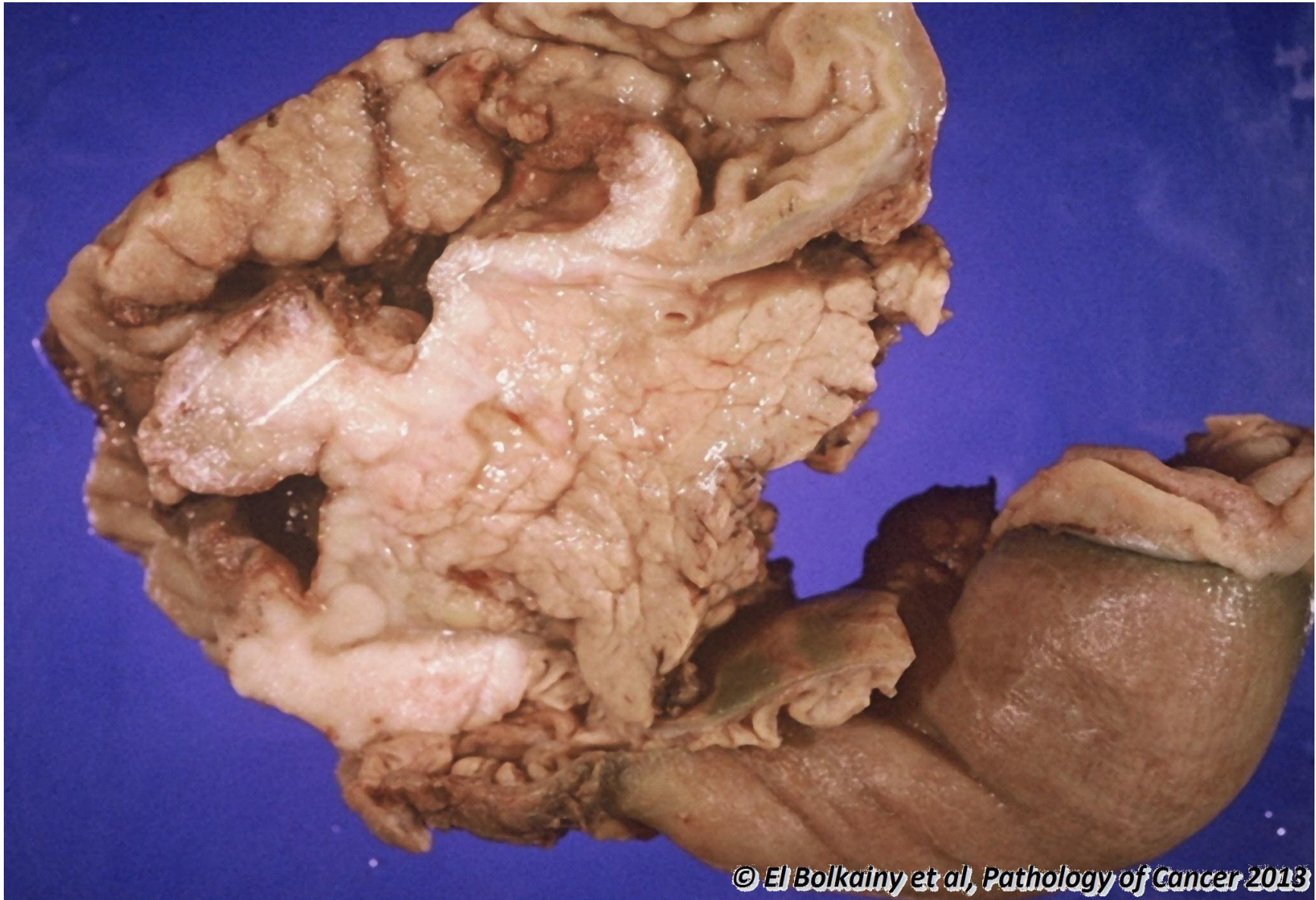
Picture 14-29 Hilar cholangiocarcinoma (Klatiskin tumor), histology. The carcinoma (lower left part of the picture) must be distinguished from hyperplastic periductal glands normally present in this location. Nuclear pleomorphism and hyperchromasia as well as irregular glandular shape help to make this distinction.

14.30 Periapillary carcinoma, gross features.



Picture 14-30 Periapillary carcinoma, gross features. **A** Surface view of a tumor invading and ulcerating into the duodenum (stage IB). **B** Cut section of the tumor.

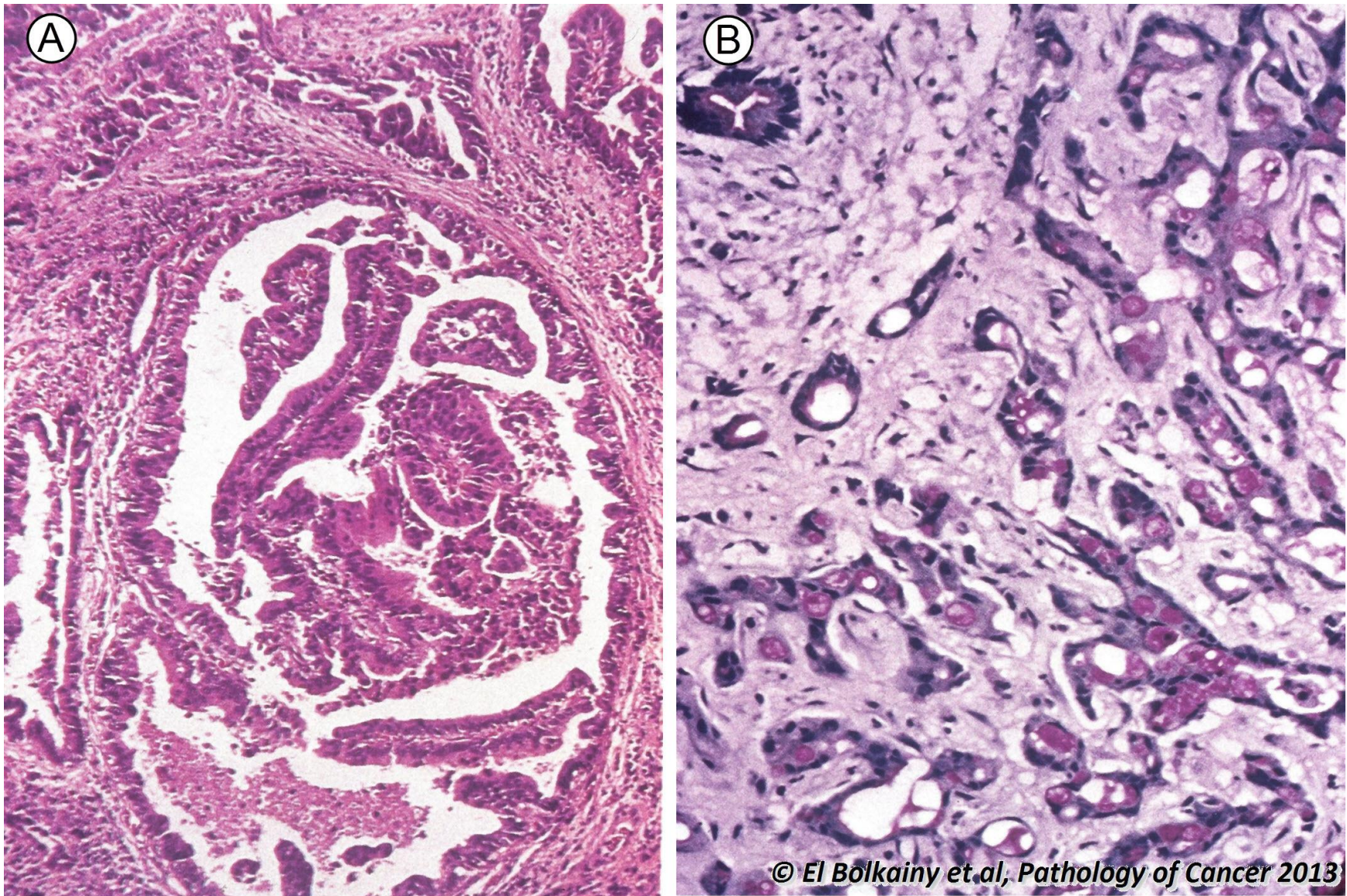
14.31 Periampullary carcinoma, gross features.



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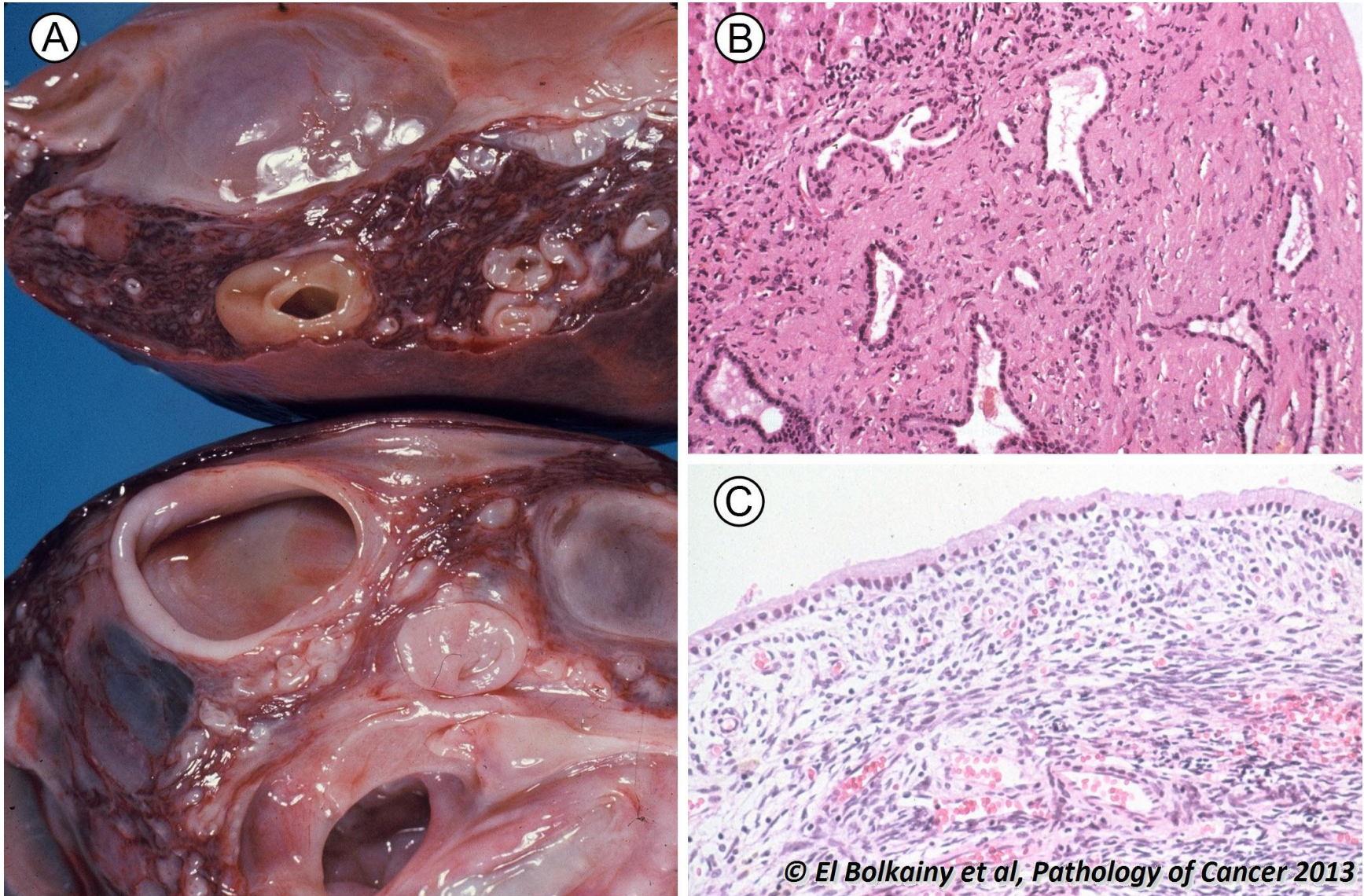
Picture 14-31 Periampullary carcinoma, gross features. A pancreatoduodenectomy specimen (Whipple operation) showing invasion of pancreas (stage IIA).

14.32 Periapillary adenocarcinoma, histology.



Picture 14-32 Periapillary adenocarcinoma, histology. **A** Papillary adenocarcinoma with invasion of stroma. **B** Gland-forming adenocarcinoma, note the marked variation in gland size and shape as well as presence of small abortive glands without a lumen.

14.33 Bile duct hamartoma.

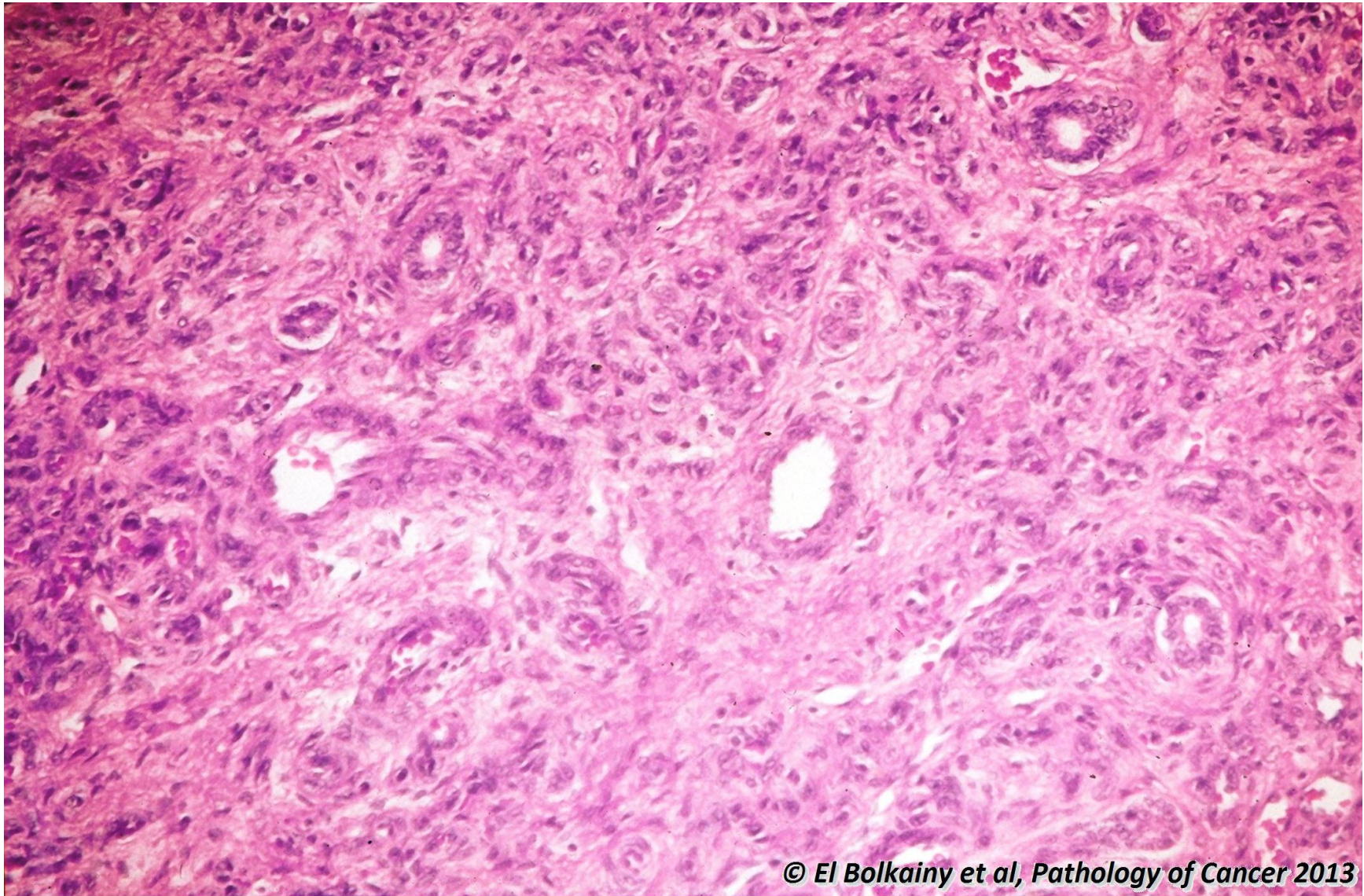


Picture 14-33

Bile duct hamartoma. **A** Grossly, it shows solid and cystic structures. **B** Histologically, it is composed of both epithelial and mesenchymal components, both are formed of mature cells. **C** It may present as a cyst with single mucinous columnar cell lining.

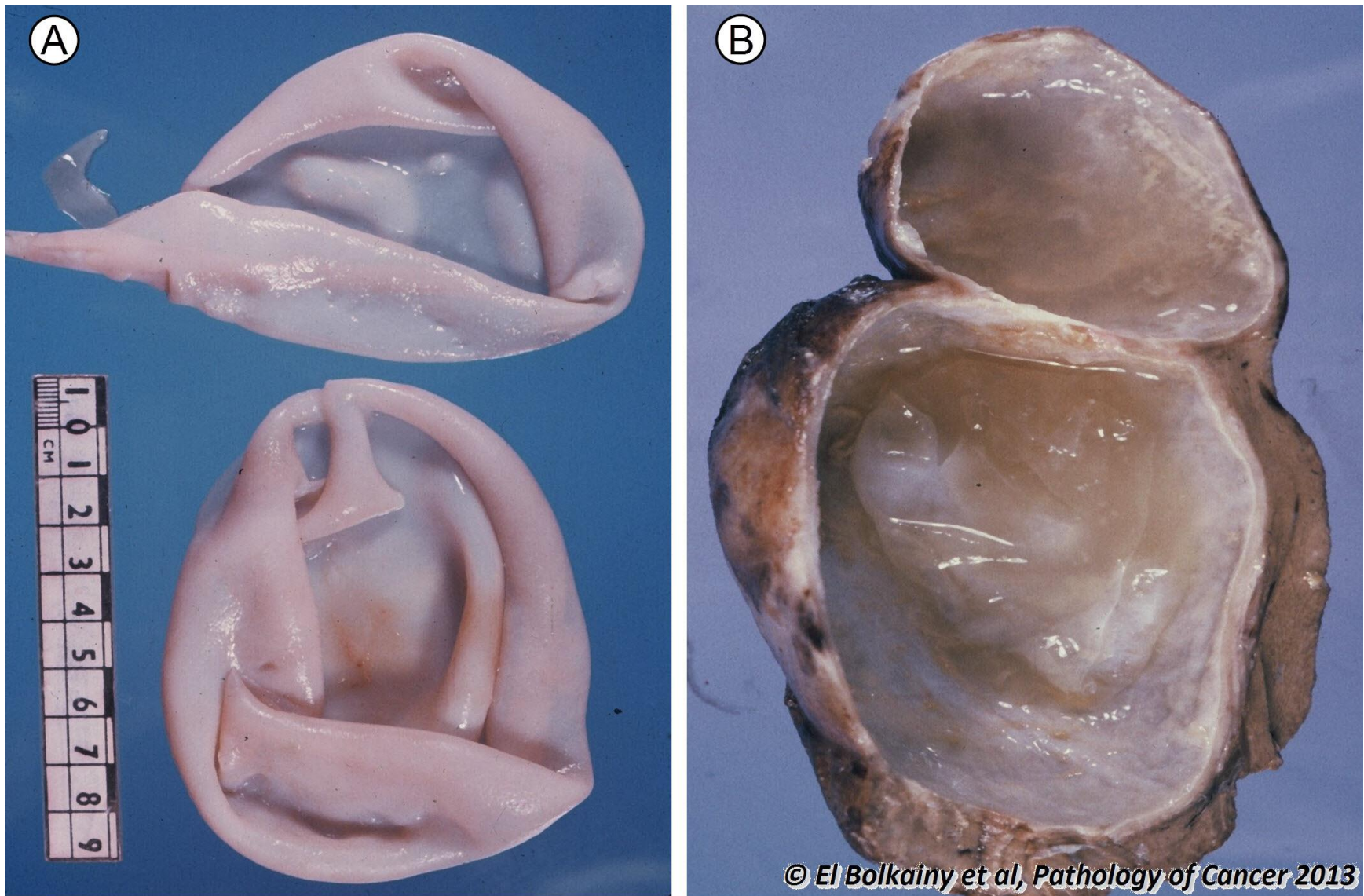
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14.34 Bile duct adenoma, histology.



Picture 14-34 Bile duct adenoma, histology. It is a small benign tumor (< 1 cm) composed of small branching bile ducts with preserved lobular pattern. It arises close to portal tracts which appear preserved and not invaded by the tumor.

14.35 Hydatid cyst of the liver (*Echinococcus granulosum*), gross features.



Picture 14-35 Hydatid cyst of the liver (*Echinococcus granulosum*), gross features. The liver is the most common site affected (70%). **A** The endocyst or laminated membrane containing scolices (embryonic stage of the parasite). **B** The fibrous ectocyst.

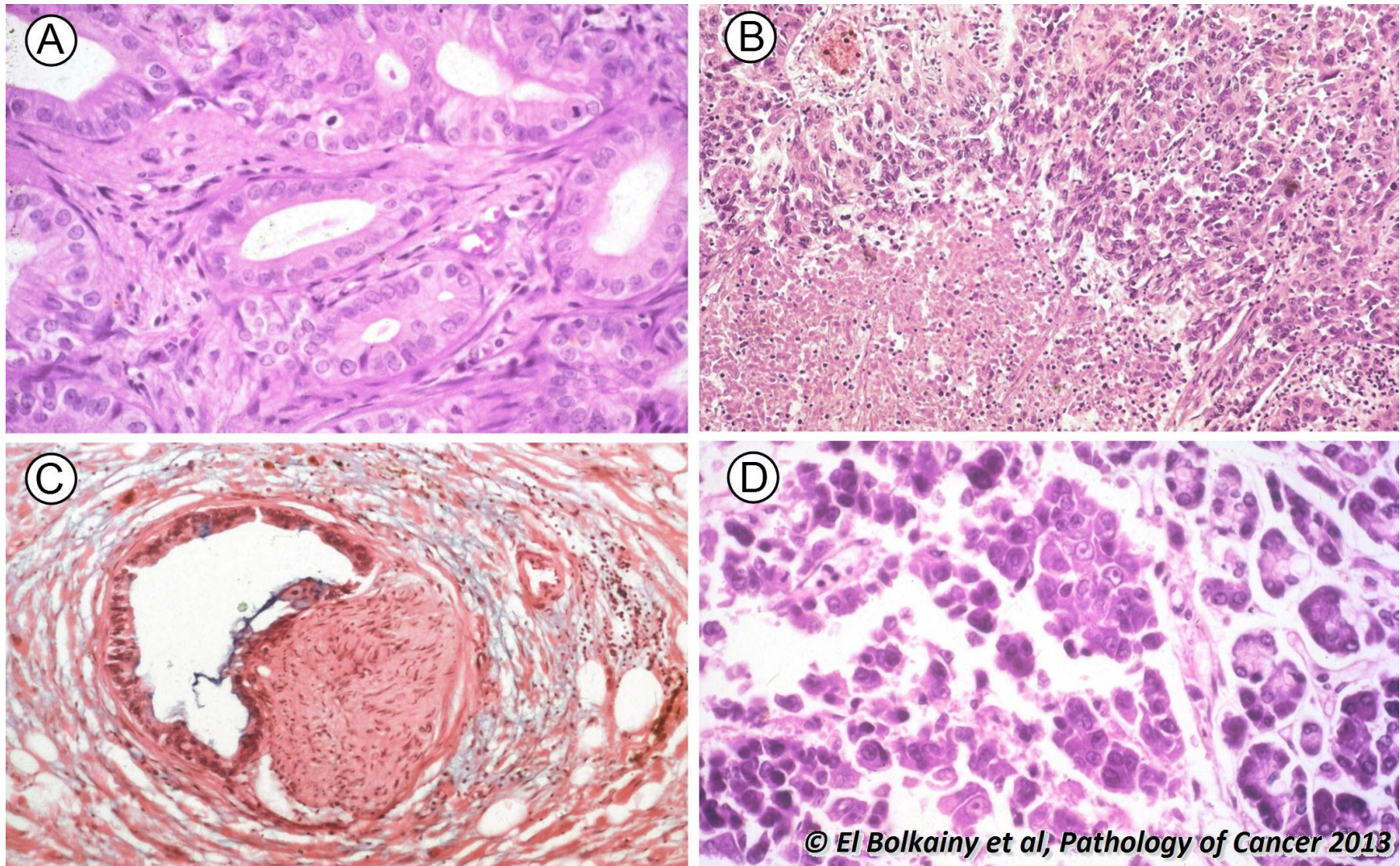
14.36 Carcinoma of head of pancreas, pancreatico-duodenectomy specimen (Whipple operation).



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Picture 14-36 Carcinoma of head of pancreas, pancreatico-duodenectomy specimen (Whipple operation). Grossly, an ill-defined invasive gray-white tumor mass is evident.

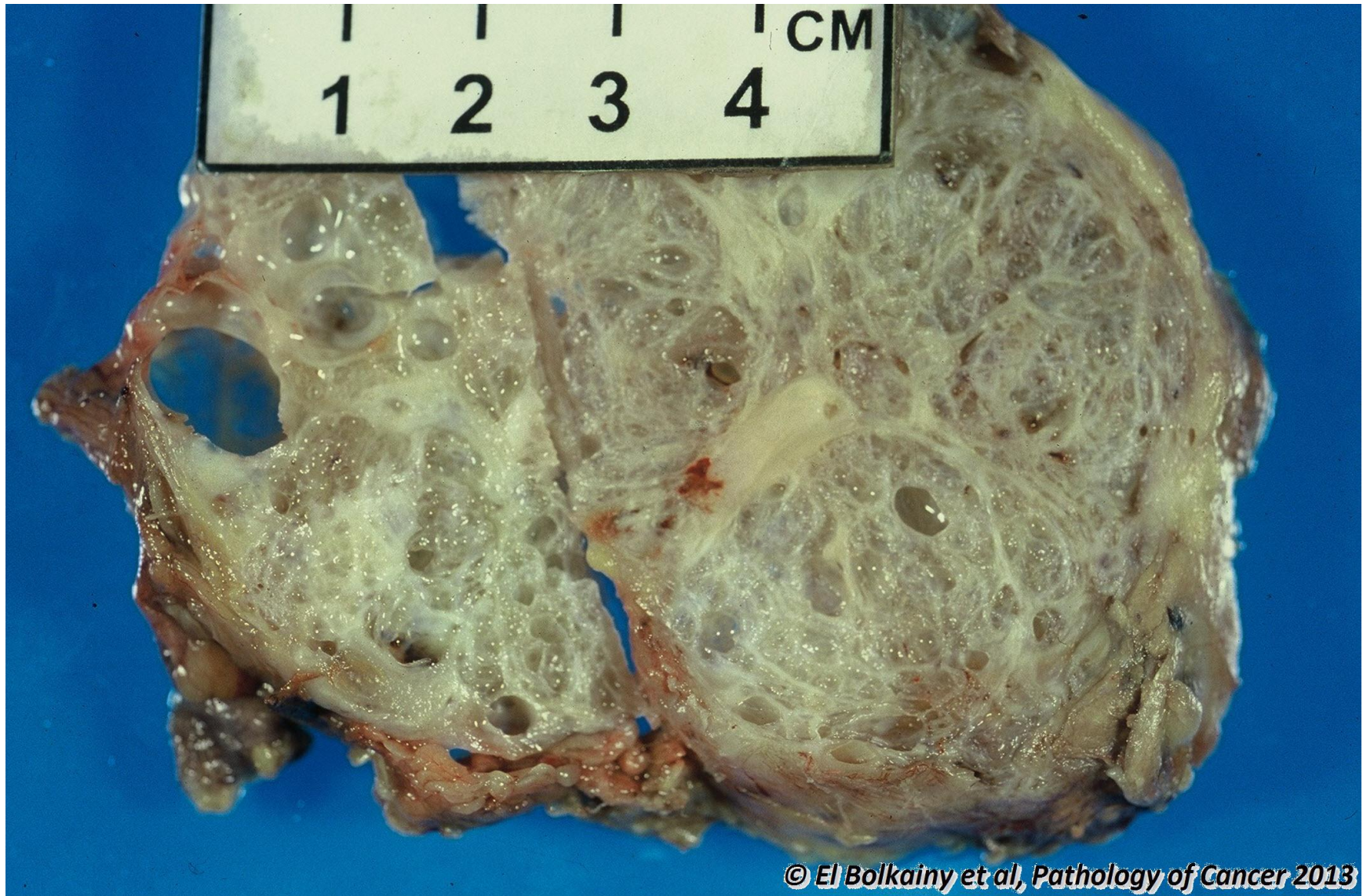
14.37 Adenocarcinoma of the pancreas, histology.



Picture
14-37

Adenocarcinoma of the pancreas, histology. **A** Ductal subtype with stratified back-to-back glands. **B** With focal necrosis. **C** With perineural invasion. **D** Acinar type is less common (2-5%), but highly aggressive (5-year survival 6%) as the ductal type. It is composed of cellular lobules with acinar differentiation and active mitosis. The cytoplasm is eosinophilic and granular (zymogen granules) positive for PAS and resistant to diastase digestion. The tumor may show focal neuroendocrine differentiation.

14.38 Microcystic serous neoplasm, gross features.



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Picture 14-38 **Microcystic serous neoplasm, gross features.** This spongy tumor is composed of microcysts (< 1cm) lined by flattened and cuboidal non-mucoid epithelium, separated by fibrous stroma. Intracystic papillary formations may be seen. The majority of these tumors are benign.

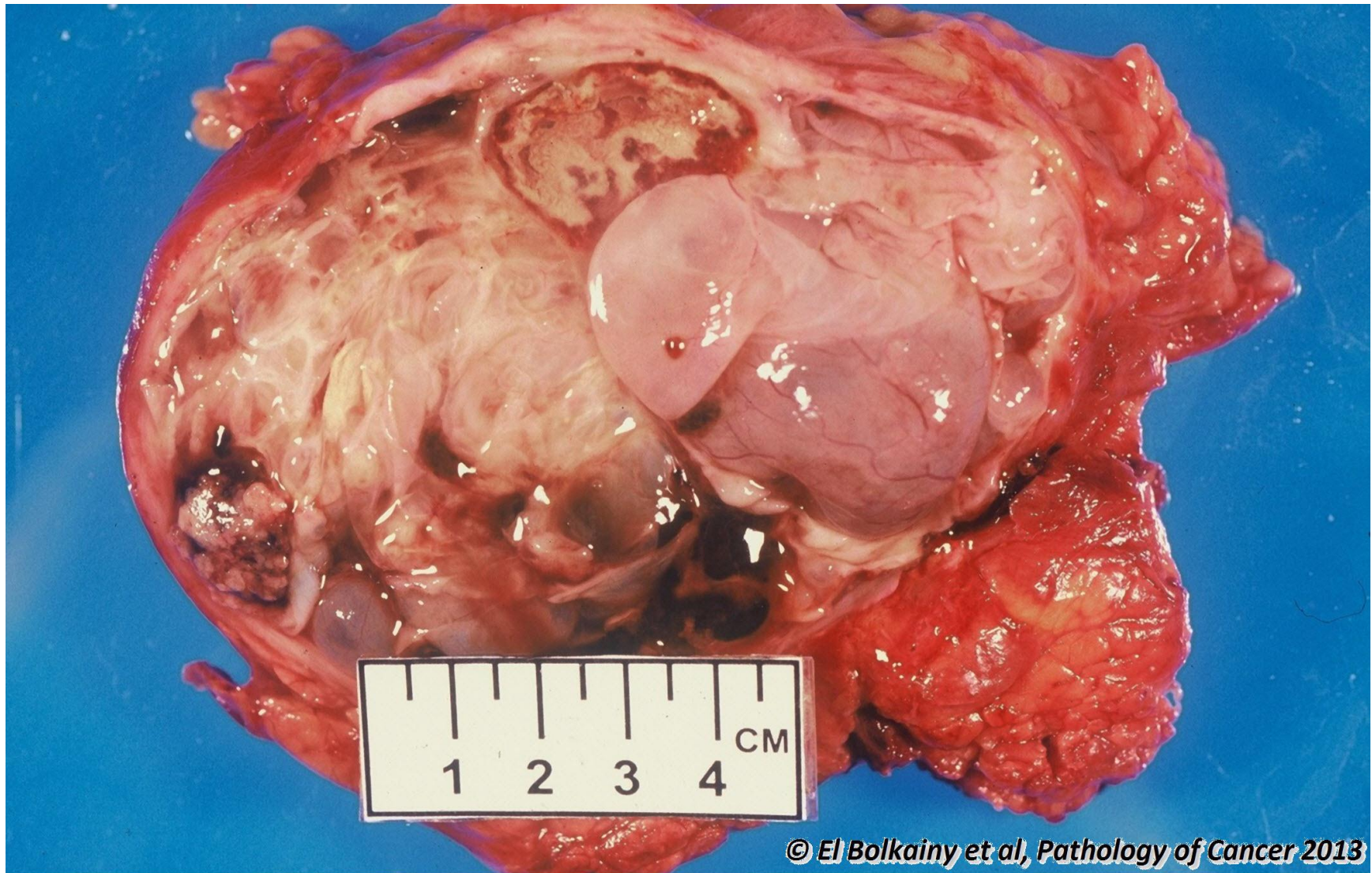
14.39 Intraduct papillary mucinous neoplasm, gross features.



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Picture 14-39 Intraduct papillary mucinous neoplasm, gross features. This tumor is more common in men (3:2) and more common in head of pancreas (70%). The pancreatic duct is dilated, filled with mucin, with papillae in its wall. Invasive areas are found in 35% of cases and 5-year survival is 55%.

14.40 Mucinous cystic neoplasm, gross features.

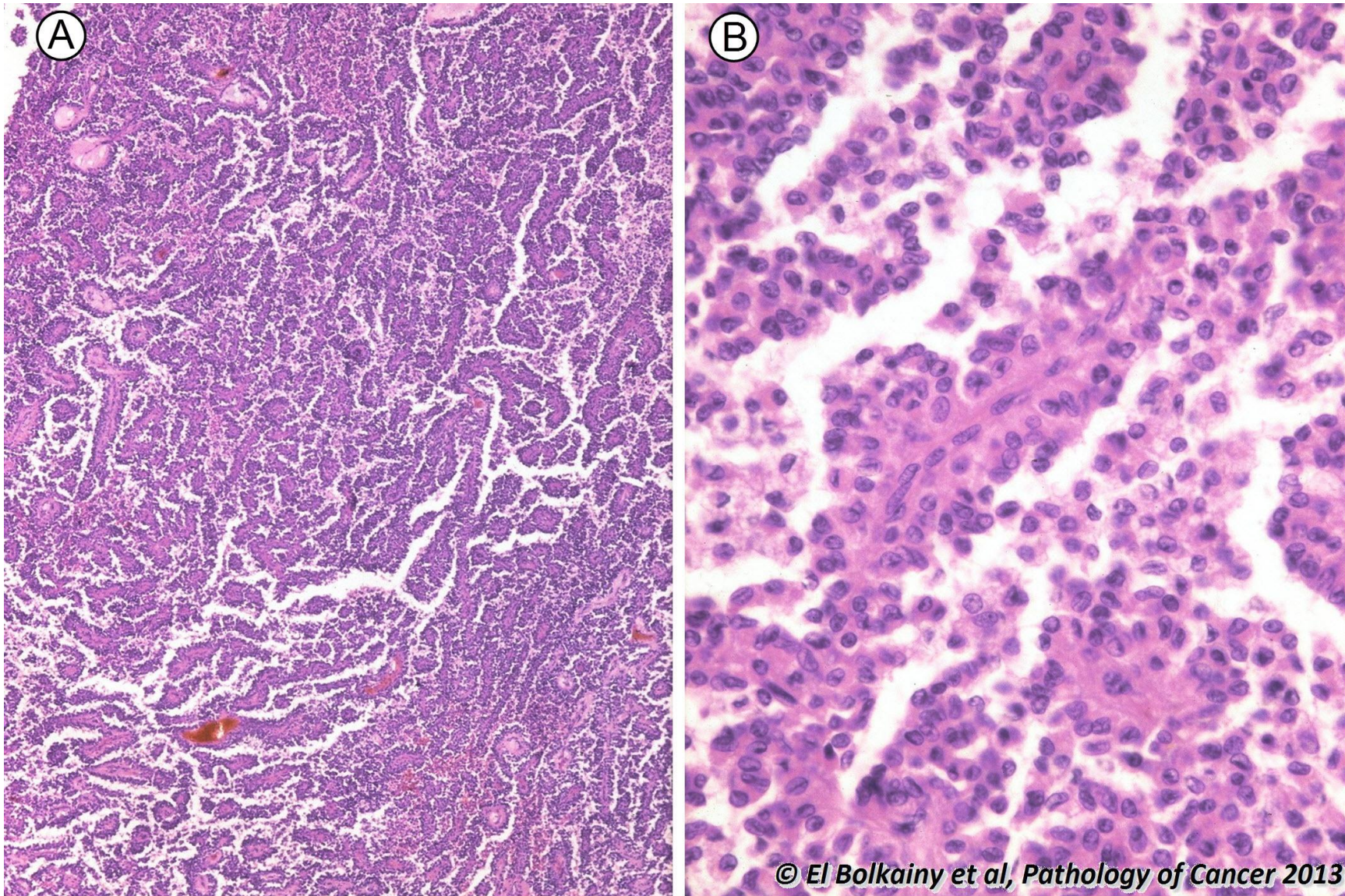


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**Picture
14-40**

Mucinous cystic neoplasm, gross features. It appears as well circumscribed multilocular cysts, filled with mucin, surrounded by thick fibrous pseudocapsule. It is lined by columnar mucinous cells, may show invasive areas (35%) or ovarian-like stroma. Ninety% of patients are females, 90% affect body and tail of pancreas and 90% of patients survive 5 years.

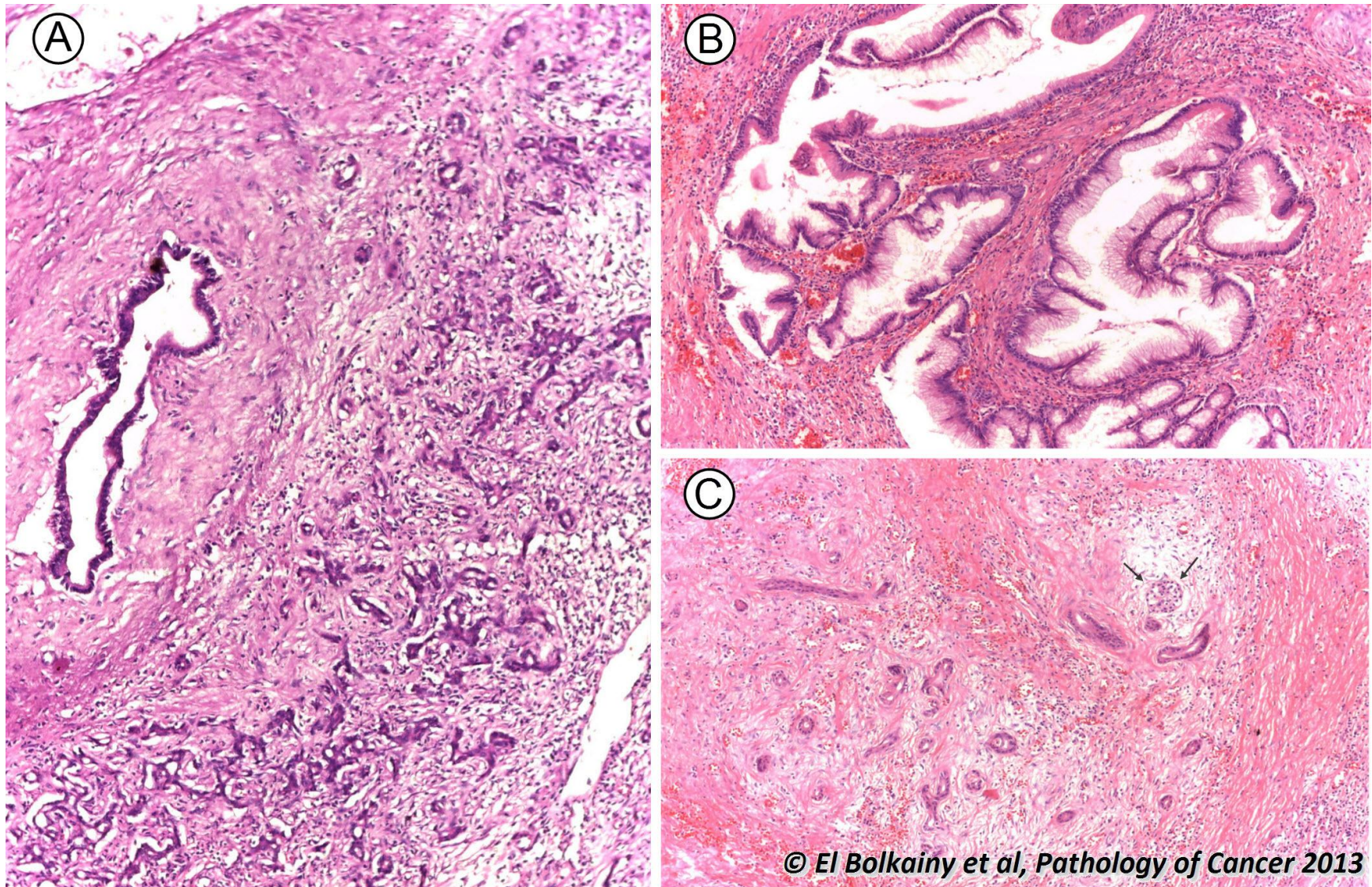
14.41 Solid-pseudopapillary neoplasm (solid cystic or Frantz tumor).



Picture 14-41

Solid-pseudopapillary neoplasm (solid cystic or Frantz tumor). Tumor tissue close to vessels appears solid, whereas, that away from vessels show loose cells and undergoes cystic change. Immunophenotype is complex, but, the tumor is positive for CD 56, vimentin and α 1- antitrypsin. No sex or pancreatic site predilection and 5-year survival is 90%.

14.42 Chronic pancreatitis.



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**Picture
14-42**

Chronic pancreatitis. It results from several causes (alcohol-related, hereditary or autoimmune), may present by mass lesion or biliary obstruction. The histology of needle biopsy shows some features distinctive from carcinoma such as **A** lobular pattern with large ducts surrounded by small ducts, **B** large well-differentiated duct, and **C** small ducts and a nest of islet cells (arrows).

