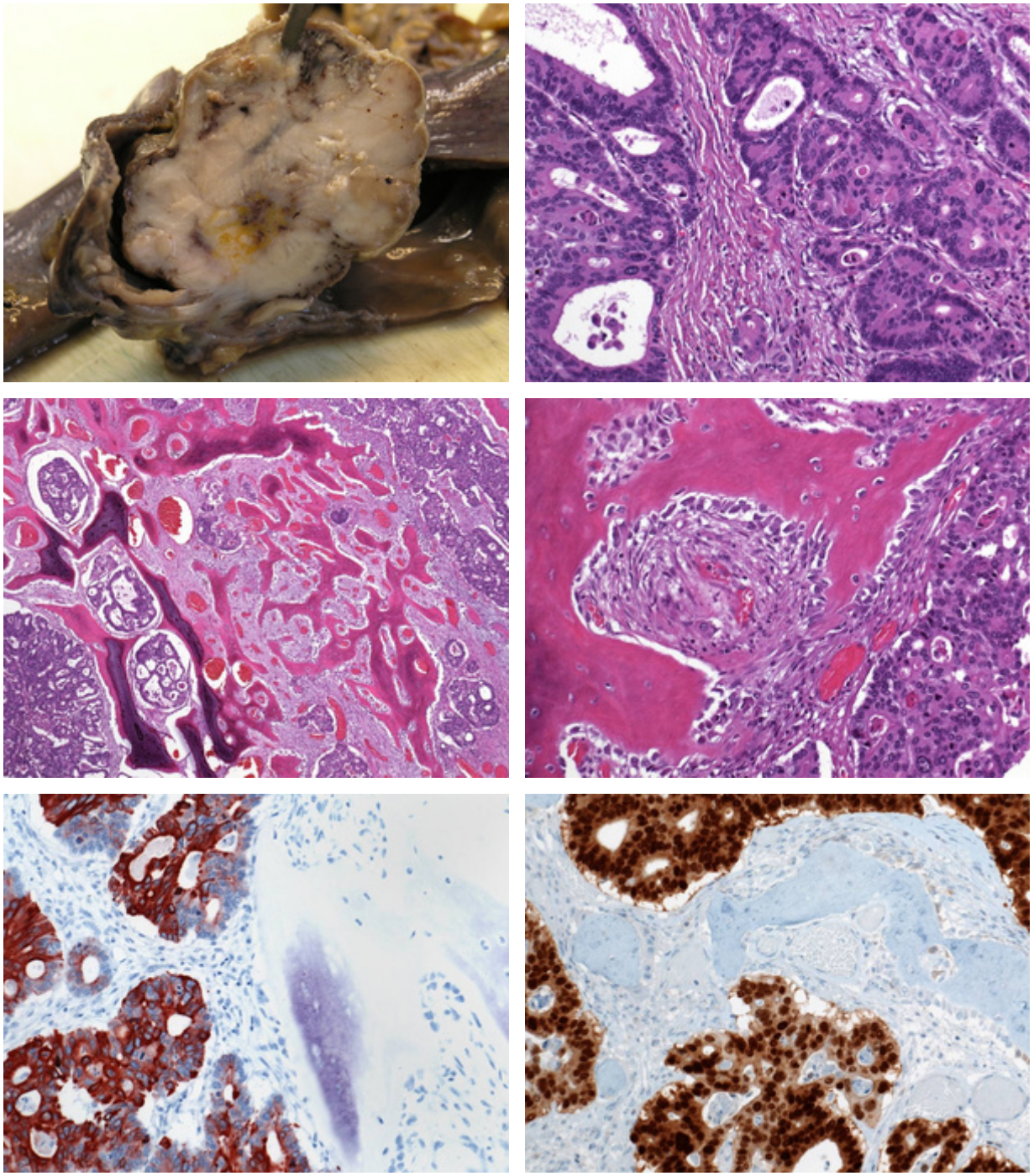
October 2013

Stenosing tumour in the sigmoid colon of a 70-year-old male.

What is your diagnosis?



Diagnosis

Colorectal adenocarcinoma with heterotopic ossification.

Comment

The gross inspection of the resection specimen shows a polypoid tumour with irregular cut surface, measuring 9.5 cm in largest diameter (Panel A). Histology is consistent with invasive, moderately differentiated adenocarcinoma extending through the muscularis propria, but not involving the serosal surface (Panel B).

Irregular islands of benign-looking mineralized osteoid bone, rimmed by a layer of osteoblasts, are present within the cancer stroma (Panels C and D). Upon immunohistochemistry, the cancer cells are positive for Keratin 20 (Panel E) and the nuclear transcription factor CDX-2 (Panel F), yet negative for Keratin 7 and markers of neuroendocrine differentiation (not shown).

Heterotopic bone formation (osseous metaplasia) is a rare event in colorectal cancer with less than 100 cases having been reported in the literature so far. The diagnosis is based upon the presence of foci of metaplastic bone within the stroma of an otherwise typical (“usual”) adenocarcinoma. Ossification may be observed in primary tumours, metastastic sites or both and has anecdotally been reported to occur already in colorectal adenomas. Histogenetically, the metaplastic bone formation has been attributed to the expression of bone morphogenetic proteins (BMPs) in cancer cells.

The clinical course and prognosis of colorectal adenocarcinoma with heterotopic ossification does not differ from carcinoma without ossification. The lesion has to be differentiated from carcinosarcoma in which the sarcomatous component can include heterologous components such as osteosarcoma, chondrosarcoma or rhabdomyosarcoma.

For further reading

- Imai N, Iwai A, Hatakeyama S, Matsuzaki K, Kitagawa Y, Kato S, Hokari R, Kawaguchi A, Nagao S, Miyahara T, Itoh K, Miura S. Expression of bone morphogenetic proteins in colon carcinoma with heterotopic ossification. Pathol Int. 2001;51:643-8.
- Kypson AP, Morphew E, Jones R, Gottfried MR, Seigler HF. Heterotopic ossification in rectal cancer: Rare finding with a novel proposed mechanism. J Surg Oncol. 2003;82:132-6.
- Al-Daraji WI, Abdellaoui A, Salman WD. Osseous metaplasia in a tubular adenoma of the colon. J Clin Pathol. 2005;58:220-1.

Presented by

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