Primary Neuroendocrine Tumor (Carcinoid) of the Mesocolon

Nimrod A. Kimchi MD[1], Gourion Rivkin MD[2], Yaron Wiener MD[2], Judith Sandbank MD[3] and Ariel Halevy MD[2]

[1]Institute of Gastroenterology, Liver Diseases and Nutrition, [2]Department of Surgery B and [3]Institute of Pathology, Assaf Harofeh Medical Center, Zerifin and Sackler Faculty of Medicine, Tel Aviv University, Israel

Key words: neuroendocrine tumors, carcinoid tumor, mesolon, mesentery, colon

IMAJ 2001;3:288–289

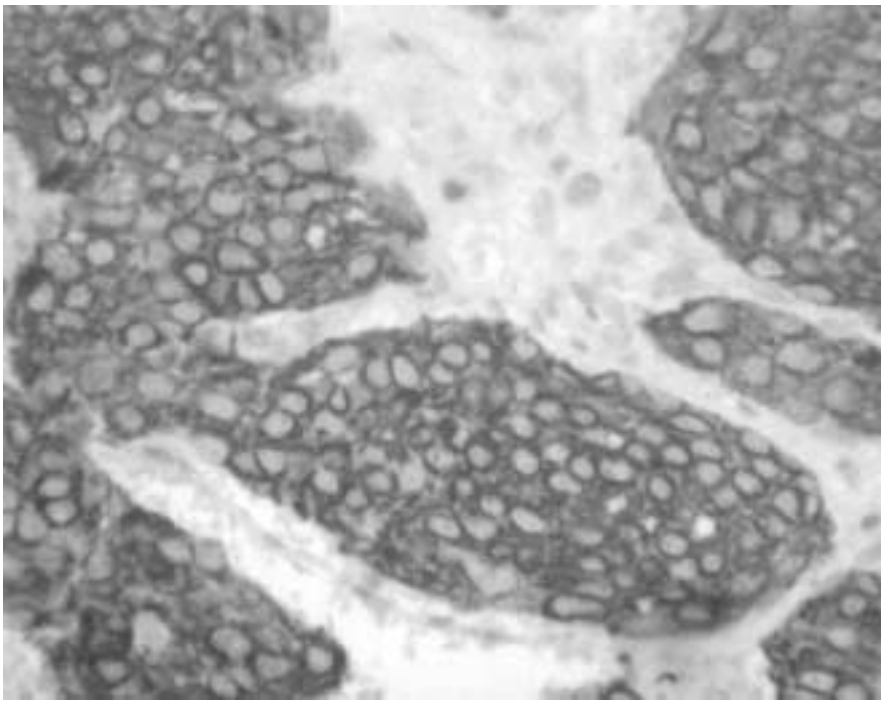
Most of the neuroendocrine tumors of the gastrointestinal tract are traditionally termed "carcinoid tumors." More than 90% of gastrointestinal carcinoids are located in the appendix, small intestine and rectum [1]. Even when invasive, most carcinoids are relatively indolent and display a minimal histological pleomorphism. A minority of these tumors are clinically more aggressive and have a less differentiated histological pattern. For these cases, some authors use the term "anaplastic neuroendocrine carcinoma." While carcinoid tumors of the intestine frequently invade the mesentery, a primary carcinoid (or neuroendocrine tumor) of the mesentery appears to be extremely rare.

Patient Description

A 74 year old woman presented with complaints of peri-umbilical abdominal pain, constipation and fever of 3 days duration. Her past history included arterial hypertension treated with nifedipine and a duodenal ulcer treated with ranitidine. On admission, she was febrile (38.4°C) and physical examination was unremarkable except for epigastric tenderness without peritoneal signs. Hemoglobin was 12.2 mg/dl, white blood cell count 11,700/mm^3; and amylase, bilirubin and urea in serum were within normal values. Based on a preliminary interpretation of an abdominal ultrasound performed in the emergency room – namely, a normal gallbladder with a slightly dilated biliary tree – the early working diagnosis was a possible cholangitis. Intravenous antibiotics were started. However, on the second day, liver function tests were normal and cholangitis seemed unlikely. The patient became afebrile from the third day. An abdominal computed tomography scan revealed a solid tumor, 6x8 cm, between the gastric antrum and the third part of the duodenum. A subsequent upper gastrointestinal endoscopy was normal. An endoscopic ultrasound was non-diagnostic.

On laparotomy, a large tumor with a rubber-like consistency was found in the transverse mesocolon, adjacent to the anterior aspect of the pancreas. No other tumor was detected in the small or large intestine. An extended right hemicolectomy was performed.

Separately submitted to histopathology were a right hemicolectomy specimen with no significant morphological abnormalities and a fragment of the mesenteric fat, within which a macroscopically rather well-circumscribed mass measuring 4x5x14 cm was noted, with a gray-tan color and foci of necrosis on cut sections. Microscopy revealed a cellular tumor with prominent fibrovascular compartmentalization of tumor nests and trabecule formation. Both coagulative necrosis and small punctate foci of necrosis were noted. Most nuclei were small with the typical slightly coarse chromatin and inconspicuous nucleoli. Only a mild to moderate degree of pleomorphism was observed. The mitotic activity was low. However, numerous apoptotic bodies were present. No vascular invasion was observed. One



of four lymph nodes showed metastatic involvement. Immunohistochemical studies revealed positive staining with pancytokeratin, EMA, chromogranin [Figure A], synaptophysin, s100 protein, leu7 and weak staining with **NSE**. Ki67 decorated only 10% of the tumor cells. The tumor failed to stain for vimentin, P53 and neurofilaments.

The postoperative course was uneventful, and a postoperative small intestinal series was normal. Two months after surgery, an abdominal and chest SPECT octeotride scintigraphy revealed no uptake. Eight months after surgery, a follow-up examination (including abdominal CT, colonoscopy, blood tests and urinary 5-HIAA) was unremarkable.

Comment

The morphological and immunohistochemical features place the described tumor in the neuroendocrine tumor group. However, the sub-classification of these tumors is not as well defined as in the lung. The tumor's large size and extensive necrosis are adverse features supported by the presence of a metastatic lymph node. However, the low mitotic rate and low proliferation rate (rather sparse Ki67 staining) and the only mild to moderate cytologic pleomorphism do not enable the diagnosis of a high grade neuroendocrine carcinoma. Therefore, the diagnosis of an intermediate grade neuroendocrine tumor (or "atypical carcinoid") seems to be the most appropriate diagnosis.

Most of the infrequently reported mesenteric tumors are fibromas/fibrosarcomas, leiomyomas/leiomyosarcomas, neurofibromas or mesenchymomas (benign or malignant). In a literature search (1966–1998), we found only two case reports of primary neuroendocrine tumors of the mesentery. In one patient with von Recklinghausen's disease, a carcinoid was found arising in the mesentery of the duodenum near Treiz's ligament and involving the left kidney. On follow-up, a primary tumor was excluded only with gastrointestinal series, abdominal CT and 5-HIAA at 6 and 12 months after surgery [2]. However, we believe that without a meticulous pathological examination of the resected adjacent bowel (the patient underwent only a simple excision of the tumor), a possible primary tumor cannot be excluded. In the small bowel, even small carcinoids frequently metastasize. In the Mayo Clinic series [1], 15 of 27 small (5-10 mm) carcinoids of the small bowel metastasized.

In the other reported patient, a primary carcinoid tumor of the mesentery was resected with the adjacent ischemic ileal loop. Four years later, an autopsy indeed showed a metastatic carcinoid (lymphs nodes and liver) without evidence of a primary carcinoid elsewhere [3].

Typical carcinoid tumors of the colon (except rectum) are rare [4]. However, Saclarides and co-workers in a retrospective study [5] found that 3.9% of 988 cases of colorectal cancer were neuroendocrine tumors. Most of them also contained a proportion ($<50\%$) of exocrine (adenocarcinoma) differentiation.

One can argue that in our case, the tumor found in the mesocolon was a metastasis of a missed adjacent colonic neuroendocrine tumor. However, another tumor was not demonstrable on abdominal CT or during laparotomy. More important is the fact that our pathologists did not find a primary lesion in the resected colon. In contrast to small intestinal carcinoids, colonic carcinoids are large and bulky at presentation. In one series [4], all 36 colonic carcinoids were >2 cm with an average size of 5.8 cm. In our case, missing a primary colonic lesion therefore seems unlikely. Neuroendocrine tumors have been found in almost every organ derived from the primitive entoderm [1]. It is possible that they originate from amine precursor uptake and decarboxylation cells in autonomic nerves within the mesocolon. In conclusion, we believe that the presented case is the first report on a primary neuroendocrine tumor of the mesocolon.

References

1. Kvols LK. Gastrointestinal carcinoid tumors and the malignant carcinoid syndrome. In: Feldman M, Scharschmidt BF, Sleisenger MH, eds. Sleisenger and Fordtran's Gastrointestinal and Liver Disease. 6th ed. Philadelphia: W.B. Saunders, 1998:1831–43.
2. Stone NN, Atlas I, Kim US, Kwan D, Leventhal I, Waxman JS. Renal angiomyolipoma associated with neurofibromatosis and primary carcinoid of mesentery. *Urology* 1993;41:66–71.
3. Barnardo DE, Stavrou M, Bourne R, Bogomoletz WV. Primary carcinoid tumor of the mesentery. *Hum Pathol* 1984;15:796–8.
4. Spread C, Berkel H, Jewell L, Jenkins H, Yakimets W. Colon carcinoid tumors. A population-based study. *Dis Colon Rectum* 1994;37:482–91.
5. Saclarides TJ, Szeluga D, Staren ED. Neuroendocrine cancers of the colon and rectum. Results of a ten-years experience. *Dis Colon Rectum* 1994;37:635–42.

Correspondence: Dr. A. Halevy, Head, Dept. of Surgery B, Assaf Harofeh Medical Center, Zerifin 70300, Israel. Phone: (972-8) 977-9222, Fax: (972-8) 977-9225,
email: ahalevi@assaf.health.gov.il

I have nothing to declare except my genius

Oscar Wilde, Irish playwright, poet and wit (1854–1900), replying to the customs officer at the New York Custom House on his arrival in the United States in 1882