

Angiography of Omental Mesothelioma

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Angiographic features of three cases of omental mesothelioma are presented. These lesions appeared mildly or moderately hypervascular without arteriovenous shunting or arterial encasement. The predominant feeding arteries were the right and left gastroepiploics. Since arteriography may be performed in the evaluation of the often nonspecific presenting symptoms of patients with abdominal mesothelioma, radiologists should be aware of these abnormalities.

The accurate preoperative diagnosis of abdominal mesothelioma is infrequently made. The neoplasm is relatively rare, and its presenting symptoms usually are entirely nonspecific [1, 2]. Routine radiography is rarely helpful [3, 4]. Arteriography may be done in these patients with persistent abdominal complaints and a normal radiographic evaluation otherwise, especially if ascites causes clinical suspicion of portal hypertension.

Retrospective recognition of dilated omental arteries and scant neovasculature on a celiac arteriogram of a patient with peritoneal mesothelioma allowed us to make an accurate preoperative diagnosis in two subsequent patients. None of the patients had known asbestos exposure.

Case Reports

Case 1

A 59-year-old man without history of asbestos exposure had a 6-week history of abdominal pain, early satiety, and increasing frequency of bowel movements. Extensive radiologic evaluation including chest radiography, upper gastrointestinal series, barium enema, excretory urography, and oral cholecystography was unrevealing. Abdominal CT scanning was not available at that time. Celiac and superior mesenteric and hepatic arteriography were initially interpreted as normal. The diagnosis of omental and peritoneal mesothelioma was made at autopsy 9 months later. On review of the arteriogram, we realized the significance of dilated omental arterial branches as well as some barely appreciable neovasculature (fig. 1). Omental veins were also dilated.

Case 2

A 55-year-old man with no known asbestos exposure had a 6-month history of increasing abdominal girth. Radiologic evaluation including chest radiography, upper gastrointestinal series, barium enema, oral cholecystography, and abdominal CT scan were nondiagnostic. Sonography demonstrated ascitic fluid. Cytologic examination revealed abnormal cells suggestive of neoplasm of unknown primary. Celiac angiography demonstrated enlarged omental vessels arising from the right and left gastroepiploic arteries (fig. 2A). Many enlarged tumor vessels were present in the region of the greater omentum (fig. 2B). There was no evidence of pancreatic carcinoma. From our previous experience with these angiographic findings, the preoperative diagnosis of omental mesothelioma was made; this was confirmed

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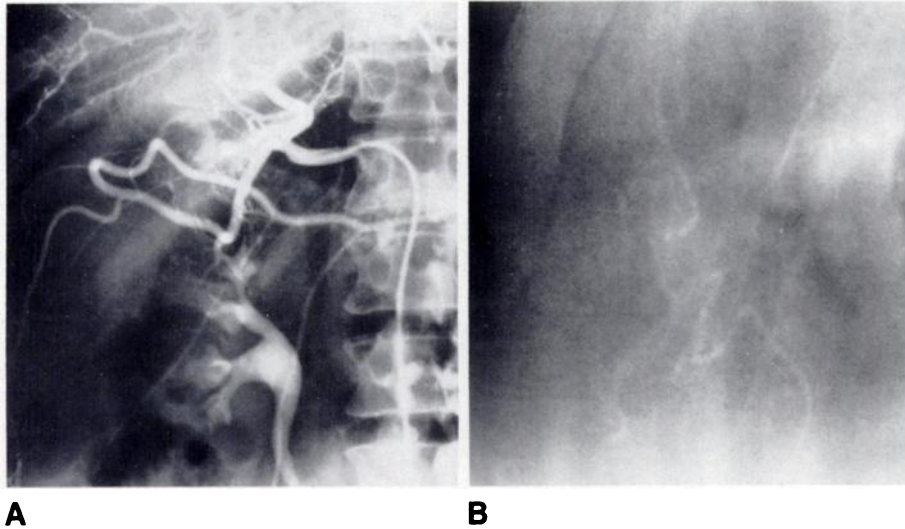


Fig. 1.—**A**, Case 1. Common hepatic arteriogram. Multiple large omental branches of right gastroepiploic artery. **B**, Close-up of distal omental artery branches. Some scant neovascularity, appreciated only in retrospect.

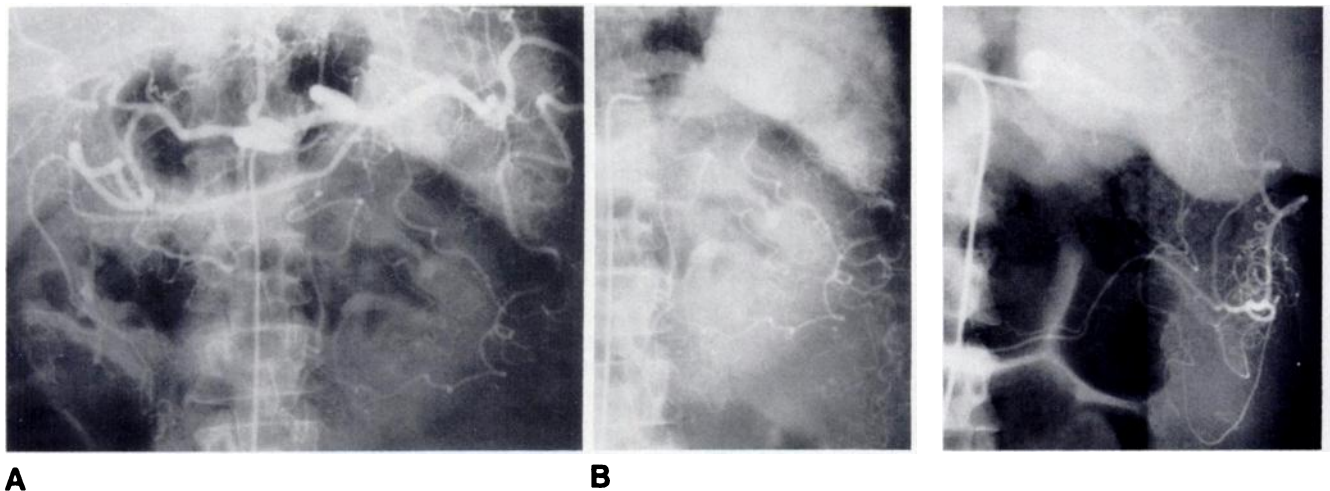


Fig. 2.—Case 2. **A**, Celiac arteriogram. Multiple large omental branches of right and left gastroepiploic arteries. **B**, Later film during celiac arteriogram. Nest of tortuous tumor vessels in left abdomen.

Fig. 3.—Case 3. Splenic arteriogram. Large tumor vessels arise from left gastroepiploic omental branches.

at surgery. A LeVeen shunt was done for persistent ascites; the patient died of massive pulmonary metastases 4 months later.

Case 3

A 64-year-old man, a heavy drinker, had abdominal pain and ascites. An upper gastrointestinal series was normal; CT was not done. Cytology of aspirated fluid was nondiagnostic. Arteriography was done because it was suspected the patient had cirrhosis and portal hypertension. Hepatic wedge pressure was normal, but there was abundant neovascularity on a splenic arteriogram (fig. 3). Because of similar findings on our two previous patients, omental mesothelioma was suggested and confirmed at the time of surgical exploration. The patient died 6 months later.

Discussion

Mesothelioma is a rare neoplasm arising from the serosal lining of chest, abdomen, or pericardium. Abdominal meso-

thelioma occurs about half as frequently as pleural mesothelioma [1]. The incidence of all mesothelioma seems to be increasing and has a relation to asbestos exposure, the association being stronger for peritoneal than for pleural mesothelioma [2].

Symptoms are often nonspecific and of insidious onset; they include abdominal pain and distension, weight loss, digestive disturbances, and edema. Less commonly, patients have nausea, fever, and bowel obstruction [1, 2, 5]. Pleural asbestosis may be present. Diagnosis is usually made at surgery or autopsy.

Extensive laboratory and radiographic evaluation is often not helpful [2-4]. Demonstration of exudative ascites with abnormal cells containing high levels of acid mucopolysaccharides is suggestive but not diagnostic.

The descriptions of angiographic features of peritoneal mesothelioma are few [4]. Like the case of Lazarus et al.

[4], our cases were all mildly or moderately hypervascular and supplied by dilated branches of the gastroepiploic arteries. None had arterial encasement or arteriovenous shunting. One had dilated omental veins.

The arterial blood supply of the greater omentum arises from the right and left gastroepiploic arteries. The right gastroepiploic artery is the direct continuation of the gastroduodenal artery after it supplies the pancreas, duodenum, and gastric antrum. The left gastroepiploic artery arises from a large intrasplenic artery. In our experience, hypertrophy of these arteries may be seen in patients who have had previous abdominal surgery or peritonitis. Similar epiploic artery enlargement might be seen in metastatic disease to the omentum [6] and possibly in cases of longstanding intraabdominal inflammation.

The overall incidence of peritoneal mesothelioma is small, but proliferation of reported cases over the last two decades seems to indicate increased incidence and/or recognition.

The role of CT scanning in this disease is yet to be defined;

it was not helpful in our one case in which it was done. Although the angiographic findings are not absolutely specific, one may strongly suggest the possibility when these angiographic and clinical features occur.

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