

ENCASEMENT OF THE SPLEEN: CASE REPORT

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In a patient with extensive reticulum cell sarcoma involving the abdomen and thorax, encasement of the spleen was demonstrated by scintillation imaging. The features of this observation, not previously reported, and its diagnostic significance are discussed.

Encasement is defined as "the state of being enclosed in or as in a case." Well-known clinical examples of encasement include Sudek's atrophy, fibrothorax, and some forms of pericarditis. We wish to report a new observation, neoplastic encasement of the spleen, detectable by scintillation imaging.

CASE REPORT

KM (PH #2058793), a 72-year-old white woman, was admitted for weight loss, dorsolumbar pain, orthopnea, and cough. The past medical history was noncontributory. Physical examination disclosed temperature of 100.8°F, blood pressure 150/70 mmHg, regular pulse rate of 122/min, and shallow respirations at the rate of 46/min. There was percussive dullness with absent breath sounds over the lower two-thirds of the left chest. The heart was normal by percussion and auscultation. The abdomen was soft. The liver edge extended 2 cm below the right costal margin and an ill-defined mass was palpable 6 cm below the left costal margin. The remainder of the physical examination was not remarkable; there was no lymphadenopathy.

The hemoglobin was 11.8 gm/dl, the hematocrit 36.5%, the red cell count 4.2 million/mm³, and the white cell count 14,000/mm³ with 85% neutrophils, 12% lymphocytes, and 3% monocytes. The erythrocyte sedimentation rate was 72 mm/hr. Urinalysis disclosed a specific gravity of 1.025 with 1+ albuminuria and many red and white blood cells and scattered hyaline casts in the sediment. The serum calcium was 10.5 mg/dl, the phosphorus 3.9 mg/dl, the cholesterol 190 mg/dl, the total protein 7.3 gm/dl, the albumin 3.5 gm/dl, the total bilirubin 0.6 mg/dl, the alkaline phosphatase 65 mU/ml, the lactic dehydrogenase 305 mU/ml, and the transaminase 70 mU/ml. The serum chloride ion concentration was 96 meq/liter, carbon dioxide, 27 meq/liter, po-

tassium 3.5 meq/liter, and the sodium 139 meq/liter. A serologic test for syphilis was negative. A stool specimen contained no occult blood.

A left pleural effusion displacing the mediastinum was seen on the chest radiogram. The electrocardiogram revealed sinus tachycardia and left axis deviation with nonspecific mild T-wave abnormalities. An intravenous pyelogram demonstrated lateral and inferior displacement of the left kidney by a soft-tissue mass.

A liver-spleen scan using 3 mCi of ^{99m}Tc-sulfur colloid disclosed a normal liver. The spleen (Fig. 1) was enlarged and its margins were irregularly flattened in the lateral view. Centrally a large defect was noted.

Left thoracentesis yielded 1,000 ml of serosanguineous fluid that was sterile on culture. Cytologic examination disclosed red blood cells, lymphocytes, and a few pleomorphic reticulohistiocytes consistent with an inflammatory reaction or with lymphoma. A pleural biopsy disclosed squamous metaplasia with an inflammatory exudate.

Course. Treatment with Ampicillin, 500 mg q.i.d., was begun. A repeat pleural biopsy disclosed polymorphonuclear leukocytes as well as lymphocytes, plasma cells, and numerous histiocytes. Many of the latter appeared atypical but a definite diagnosis of malignancy could not be made. Culture of the pleural fluid was again negative for acid-fast bacilli and fungi.

In view of these findings, the diagnosis of lymphoma was made and treatment with allopurinol, 100 mg q.i.d., was begun. However, there was no clinical response and the patient died on the 15th day of hospitalization.

Autopsy. Autopsy disclosed an extensive reticulum cell sarcoma in the left retroperitoneum extending through the left hemidiaphragm to the pleura. The tumor encased the pancreas, left adrenal, and left ureter and was adherent to the capsule of the left lobe of the liver without invasion.

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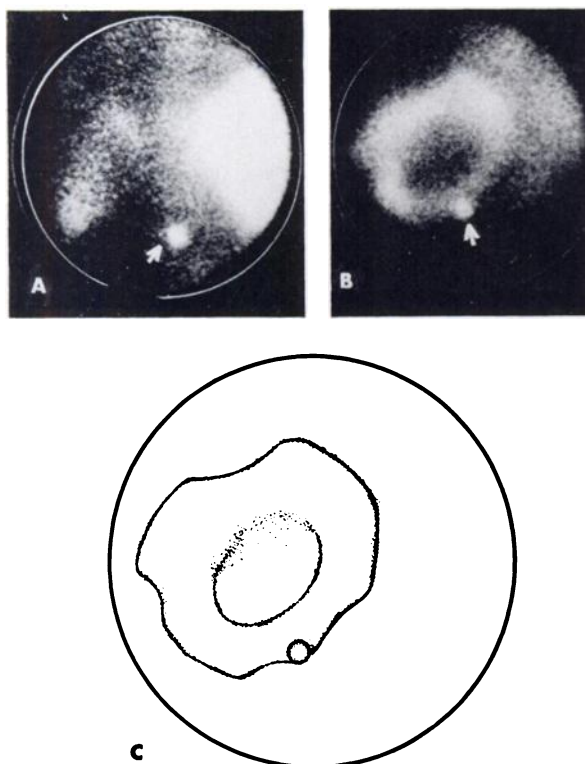


FIG. 1. Scintigraphic appearance of encased spleen. Posterior (A) and left lateral (B) images of spleen encased by, and containing, reticulum cell sarcoma. Arrows indicate radioactive landmarks. Enlarged spleen contains central defect. Note faceted appearance of margin of spleen in (B). This finding is schematically illustrated in (C).

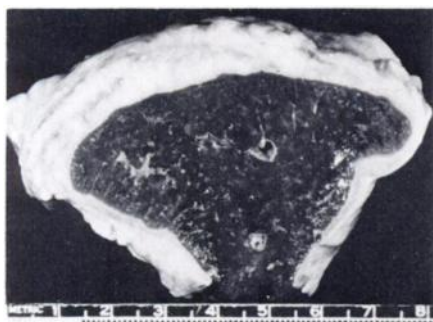


FIG. 2. Gross appearance of an encased spleen. In this 61-year-old former asbestos worker, autopsy disclosed mesothelioma filling peritoneal cavity. Spleen was completely encased by tumor. (Reprinted, by permission, from *The New England Journal of Medicine* 290: 152, 1974.)

The spleen weighed 300 gm and was also densely encased by the neoplasm. Centrally, the spleen contained a large yellow tumor nodule. The remaining pulp was friable and exhibited involvement by tumor and fibrosis. Tumor was also found in the spinal marrow.

DISCUSSION

Although this patient's reticulum cell sarcoma was suspected during life, the remarkable extent of the neoplasm was appreciated only at postmortem examination.

Scintillation imaging disclosed that the contour of the enlarged spleen was abnormal due to flattening and imprinting in multiple areas and that a central defect was present. The significance of the altered configuration, caused by neoplastic encasement, was not fully appreciated until postmortem examination and indeed has not been described before to our knowledge. It is probable that fixation of the left hemidiaphragm by sarcoma minimized the respiratory excursion of the spleen and permitted an unusually sharp image.

The spleen's internal structure is maintained by thin fibrous septa arising from the capsule and penetrating the pulp. The normal spleen is relatively soft and malleable. Since it is attached to the left upper quadrant only by the gastrosplenic and phrenosplenic ligaments, it is easily displaced by extrinsic pressure. When the spleen becomes surrounded by an expanding lesion such as sarcoma, both displacement and focal compression can occur (Figs. 1 and 2).

In this patient, splenic encasement resulted from reticulum cell sarcoma. A review of the literature has failed to document the frequency with which various sarcomas exhibit this growth pattern. Anecdotal information suggests that it is infrequent but not rare. The presence of a defect within the spleen strongly favored the likelihood of neoplasia. However, both localized inflammation and retroperitoneal fibrosis in the left upper quadrant presumably could cause encasement. Further, multiple small infarcts may make the spleen's contour irregular.

Differentiating these abnormalities is a formidable task; however, certain diagnostic aids are available. Gated inspiratory or expiratory splenic scintigraphy can be very helpful in identifying an abnormal contour and is easily performed. A patient with chronic splenic infarctions should have little or no limitation of diaphragmatic excursion whereas one with a localized inflammatory process should have severely restricted diaphragmatic movement. Splenic encasement by tumor also can limit diaphragmatic excursion, as shown in this case. Both inflammation and tumor often have positive uptake of ^{67}Ga -citrate; however, these conditions should be easily differentiated on clinical grounds. Radionuclide angiography would probably be unrewarding in the differential diagnosis of splenic infarct or tumor as most tumors involving the spleen are hypovascular when compared with adjacent normal splenic pulp. Therefore, these tumors could not be differentiated readily from infarcts or extrinsic pressure abnormalities. Newer tumor-seeking agents, such as labeled antitumor antibodies, may be of value in further assessing splenic defects when they become available.