Pseudostripe Sign in Lobar Collapse

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The stripe sign in perfusion lung scanning refers to an area of focal hypoperfusion that fails to extend to the pleural surface, leaving a peripheral rim of perfused parenchyma. Although experimental evidence suggests that the stripe sign is caused by central pulmonary emphysema, we report a case of an identical perfusion defect related to a completely collapsed left lower lobe. This etiology should be considered in the differential diagnosis of the stripe sign.

Key Words: stripe sign; perfusion; lobar; collapse; emphysema

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The stripe sign was originally described in 1982 by Sostman and Gottschalk (*1*) as a scintigraphic perfusion defect that "did not extend to the pleural surface, leaving a peripheral pleural stripe of perfused lung between the defect and the adjacent pleural surface." They demonstrated a high prevalence (28%) of this finding in patients with perfusion defects. They observed the finding more often on oblique views. Their initial data suggested that the stripe sign was 94% accurate in predicting absence of pulmonary embolism in the involved segment (*1*).

We describe a case of complete left lower lobe collapse that scintigraphically demonstrated as a medially positioned rim of perfusion that mimicked the classic stripe sign. Distinct in etiology from the typical stripe sign, we consider this an example of a "pseudostripe sign."

CASE REPORT

A 27-yr-old white man with a history of hypogammaglobulinemia, bronchiectasis and recurrent pulmonary infection causing end-stage lung disease was evaluated for bilateral lung transplantation. Preoperative ^{99m}Tc-MAA perfusion scanning was performed and the posterior view demonstrated diminished perfusion in both lower lungs with a thin peripheral stripe of perfusion medially along the mediastinal pleural surface of the left thorax (Fig. 1). A posterioanterior chest radiograph demonstrated left lower lobe collapse with compensatory overinflation of the left upper lobe and a small left hemithorax (Fig. 2). This was confirmed by CT, which demonstrated left upper lobe oligemia as well as the wedge-shaped medially positioned collapsed left lower lobe (Fig. 3). The perfusion study was believed to suggest a low probability of pulmonary embolism.

DISCUSSION

Previous investigators prospectively analyzed the database of the Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) study to evaluate the incidence of the stripe sign in patients who had pulmonary angiography (4.7%), the accuracy of the sign in precluding pulmonary embolism in the involved segment (93%) and the imaging characteristics of the sign (*2*). Evaluation of patients with the stripe sign using CT and ^{13}N PET demonstrated ^{13}N ventilation abnormalities that occurred in a central location, sparing the lung periphery. These corresponded to CT morphologic findings of regional low attenuation and oligemia and suggested a central pattern of emphysema as the etiology of the perfusion stripe sign (*3*). This case demonstrates an alternative etiology for the stripe sign. The sign in our patient is unusual in some respects compared to the usual findings in patients with an emphysematous etiology. Although in prior series the chest radiograph was abnormal in the area of the stripe sign in 33 of 52 instances (64%), focal atelectasis was seen in only one patient and lobar collapse was not present in any (*2*). A pseudostripe sign due to lobar collapse would by necessity be medially located in the case of left lower lobe collapse. If this finding were to be duplicated in the setting of collapse of other lobes, it would be predicted to occur in locations corresponding to the classical anatomic positions of collapsed lobes (e.g. anteriorly in a left lateral view in the case of left upper lobe collapse, medially and superiorly on an anterioposterior view in the case of right upper lobe collapse, medially and inferiorly on a posteroanterior view in the case of right lower lobe collapse and horizontal on a right lateral view in the case of middle lobe collapse). Associated compensatory overinflation of remaining lobes should contribute to the picture of hypoperfusion in the adjacent lung mimicking the presence of emphysema as was seen in this case.

FIGURE 1. Posterior view ^{99m}Tc-MAA pulmonary perfusion study demonstrates a thin rim of peripheral perfusion in the left lower lung medially. The overlying lung is hypoperfused creating a "stripe sign."

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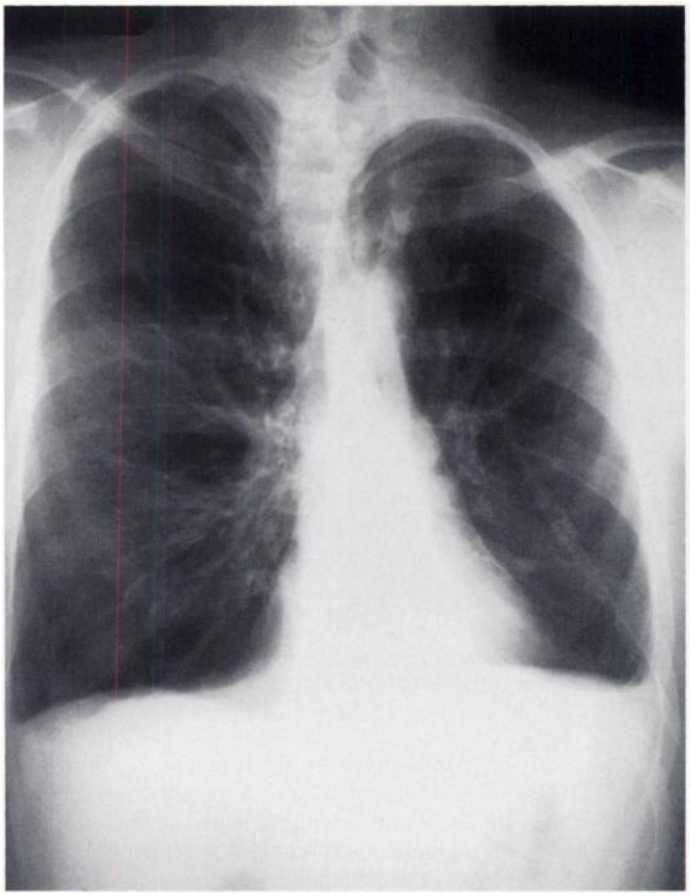

FIGURE 2. Posterioanterior chest radiograph demonstrates left lower lobe collapse with compensatory overinflation of the upper lobe causing the appearance of generalized oligemia.

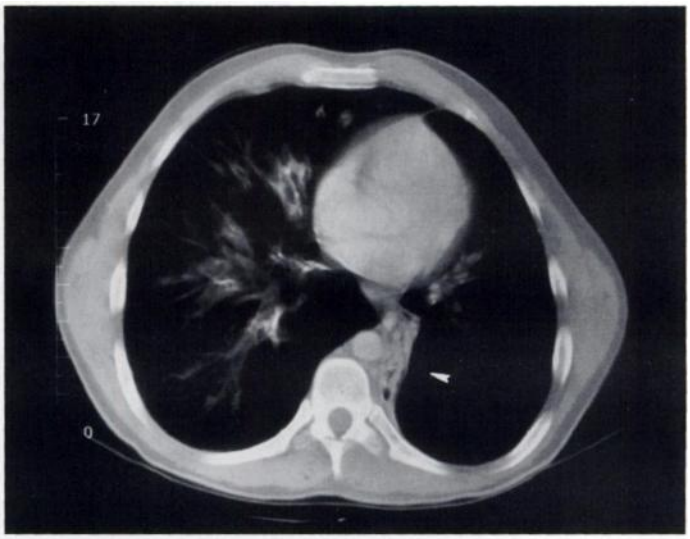

FIGURE 3. Chest CT confirms left lower lobe collapse (arrow) with oligemia of the overinflated left upper lobe.

We propose that the pseudostripe sign due to lobar collapse be included in a differential of the stripe sign and that it too should indicate the absence of pulmonary embolism in the involved lobe.

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Abnormal Colonic Accumulation of Fluorine-18-FDG in Pseudomembranous Colitis

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A 51-yr-old man with a history of pancreatic carcinoma was studied with [^{18}F]fluorodeoxyglucose ([^{18}F]FDG) and PET as part of staging for residual disease after chemotherapy. The PET study was performed during a clostridium difficile-associated diarrheal illness. Striking [^{18}F]FDG uptake was demonstrated in the wall of the colon over its entire length. Clostridium difficile associated diarrhea and mechanisms of [^{18}F]FDG uptake in normal and abnormal tissues are briefly reviewed and a mechanism for FDG uptake in this patient is postulated.

Key Words: fluorine-18-FDG; pseudomembranous colitis

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CASE REPORT

A 51-yr-old man originally presented in January 1994 with left loin pain. CT scan demonstrated a mass in the body and tail of the pancreas and additional low-density lesions within the liver suggestive of metastatic malignancy. A biopsy of the pancreatic mass was performed and histological examination depicted undifferentiated carcinoma with some elements suggestive of choriocarcinoma. There was no evidence of another primary site.

Chemotherapy was started later that month with carboplatin, ifosfamide with mesna and etoposide. After the third cycle of this treatment, the patient's β-HCG levels had fallen but remained elevated. The pancreatic mass had reduced in size. A change in treatment to a combination of procarbazine, vincristine and bleomycin (PVB) was begun at this time.

After four cycles of this combination chemotherapy regimen, repeat CT showed persistent lesions in the liver suggestive of residual tumor, but the pancreatic mass had continued to shrink.