
Gastroesophageal Reflux Demonstrated by Hepatobiliary Imaging in Scleroderma

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Radionuclide hepatobiliary imaging was performed on a patient with a longstanding history of scleroderma who presented with abdominal pain suggestive of biliary disease. Cystic duct patency was documented after 10 min with tracer accumulation in the second portion of the duodenum which failed to progress consistent with the duodenal hypomotility of scleroderma. The patient was given intravenous Kinevac resulting in gastroesophageal reflux of radionuclide.

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Scleroderma is an idiopathic, multisystem connective tissue disorder with frequent involvement of the gastrointestinal tract. Dilation and hypomotility of the esophagus is often accompanied by marked gastroesophageal reflux and esophagitis (1,2).

Radionuclide imaging with technetium-99m (^{99m}Tc) iminodiacetic acid compounds has been extensively utilized to investigate a wide variety of hepatobiliary disorders (3-5). Recent reports have demonstrated that hepatobiliary imaging is an effective technique for demonstrating enterogastric reflux (6). Approximate quantitation of enterogastric reflux can also be accomplished with computer data acquisition (7-9).

Previous reports have not emphasized that hepatobiliary imaging might be useful in documenting gastroesophageal reflux. We present a case of severe gastroesophageal reflux of bile documented by hepatobiliary imaging in a patient with extensive scleroderma involvement of the gastrointestinal tract.

CASE REPORT

A 58-yr-old white female with known scleroderma was admitted to the hospital for evaluation of cough and recurrent fever. The patient had a long history of symptomatic gastroesophageal reflux, which had been surgically treated with a transthoracic Nissen fundoplication. However, she developed recurrent and increasingly severe symptoms of reflux. During her hospital course, she developed acute right upper quadrant

pain suggesting possible cholecystitis or biliary dyskinesia. An ultrasound examination was unremarkable except for the presence of gall stones. Hepatobiliary imaging was requested to evaluate cystic and common bile duct patency.

After i.v. administration of 6.0 mCi of [^{99m}Tc]diisopropyliminodiacetic acid (DISIDA), prompt hepatic uptake and excretion was demonstrated. Gallbladder filling was seen by 10 min, documenting cystic duct patency, and the second portion of the duodenum demonstrates tracer accumulation which failed to progress consistent with the duodenal hypomotility of scleroderma (Fig. 1, left). Kinevac, 1.5 μg , was administered by i.v. bolus and imaging was continued. Within 10 min of Kinevac administration, striking gastroesophageal reflux of bile was demonstrated (Fig. 1, right). The esophageal reflux of bile extended to the mouth and was accompanied by severe waterbrash and dyspepsia. The barium swallow in our patient demonstrates characteristic dilatation of the esophagus with evidence of peptic esophagitis from persistent reflux (Fig. 2). The patient's acute abdominal pain resolved and she was treated conservatively for her reflux and esophagitis.

DISCUSSION

Systemic sclerosis or scleroderma is an idiopathic disease involving connective tissue and blood vessels. As in most autoimmune disorders, it affects women more often than men. The disorder is characterized by proliferative and obliterative vascular and microvascular lesions, resulting in atrophy and fibrosis of multiple organs. Skin involvement is the hallmark of scleroderma occurring in 90-95% of patients (10). The typical pattern of skin involvement usually affects the face and upper extremities resulting in Raynaud's phenomenon and skin tightening due to fibrosis. Involvement

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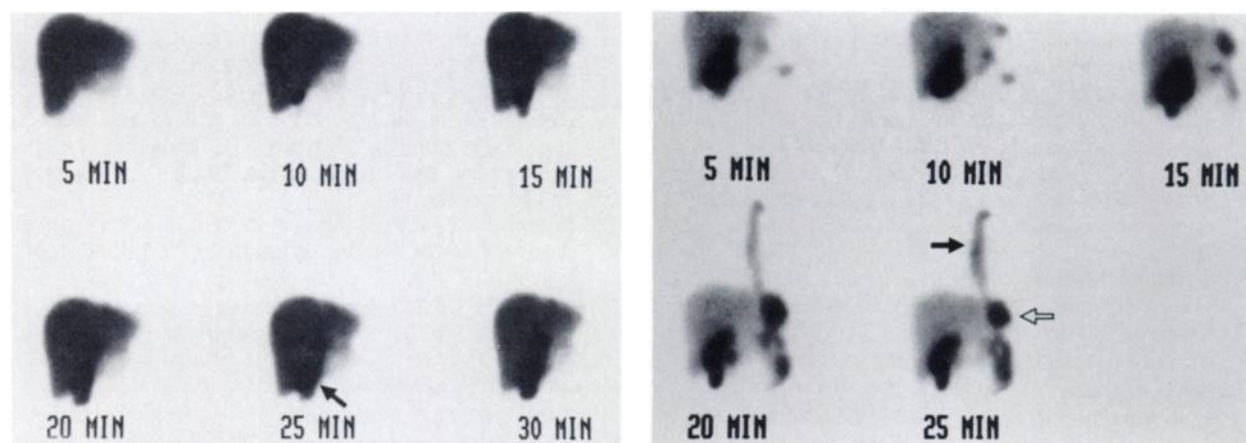


FIGURE 1

Initial serial 5-min hepatobiliary images (left) show prompt hepatic uptake, excretion, and gallbladder filling (arrow) but no gastrointestinal activity. After Kinevac administration, serial 5-min images (right) demonstrate striking enterogastric (open arrow) and gastroesophageal (closed arrow) reflux.

of the lower extremities is less frequent, and diffuse involvement of the entire skin is rare.

The second most common site of involvement is the gastrointestinal tract with a frequency approaching that

of cutaneous disease. Esophageal and duodenal-jejunal hypomotility are common findings in scleroderma, and significantly increase diagnostic specificity for this disease (1,2).

Upper gastrointestinal series usually show dilatation of the second portion of the duodenum and evidence of malabsorption, findings which are virtually always accompanied by esophageal hypomotility (11).

Previous articles have demonstrated that radionuclide scintigraphy is an accurate technique to diagnose enterogastric reflux (12,13). Quantitative techniques may be proven valuable in estimating the severity of reflux and assessing the response to medical and surgical therapy. No previous reports have demonstrated gross gastroesophageal reflux of the hepatobiliary radiopharmaceutical; however, this observation correlated well with our patient's symptoms and radiographic findings. We speculate that Kinevac may have aggravated her gastroesophageal reflux, but were unable to find evidence in the literature that Kinevac plays a direct role in regulation of lower esophageal sphincter function (14,15). Radionuclide hepatobiliary imaging may provide a useful physiological method for evaluating bilious gastroesophageal reflux in selected patients.



FIGURE 2

Barium swallow demonstrates esophageal dilation and distal esophageal ulceration (arrow) with mucosal irregularity suggestive of esophagitis.

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