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Parathyroid scintigraphy with incidental indirect finding of pancreas cancer

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ABSTRACT

Modifications of the biodistribution of 99mTc sestamibi during the myocardial perfusion and parathyroid imaging may be secondary to benign or malignant processes of visualized anatomic structures not related to the target organs of these imaging procedures. The author presents a case of pancreatic adenocarcinoma indirectly depicted on parathyroid scintigraphy.

KEY WORDS

99mTc sestamibi; parathyroid scintigraphy; biliary ducts; pancreas cancer, SPECT/CT.

99mTc sestamibi has physiologic biliary excretion during the scintigraphic evaluation of parathyroid and myocardium. Biliary and gallbladder incidental findings have been reported during these two main imaging applications of this radiotracer. The author presents an additional case of indirect incidental demonstration of pancreatic cancer with the presence of distended intra and extra-biliary ducts on parathyroid scintigraphy.

CASE REPORT

A 67-year-old woman consulted our institution for primary hyperparathyroidism. The dual radiotracer parathyroid scintigraphy was obtained with 9.25 MBq (250 μCi) of 123-I sodium iodide capsule orally and 925 MBq (25 mCi) of 99mTc sestamibi intravenously. Double isotope pinhole with subtraction imaging and SPECT/CT were performed. SPECT/CT was done about 40-60 minutes after the tracer injection using a Philips Brightview XCT camera, with a low energy high resolution collimator, a 128 x 128 matrix, and 128 angles of rotation acquisition with 20 seconds per angle. SPECT/CT showed a parathyroid adenoma at the left superior mediastinum near the thoracic inlet (Figure 1 A&B). In addition, the exam showed, at the right upper abdomen, prominent activity in the biliary ducts with cut-off sign at the distal common bile duct (Figure 1 C). The gallbladder was not seen due to a prior history of cholecystectomy. Review of her clinical notes revealed a recent history of progressively worsening back and abdominal pain, for which she had an abdominal CT exam, two months prior to the present consultation, interpreted as normal at an outside institution. Based on the scintigraphic

biliary findings, the outside CT was requested and re-interpreted with the presence of a soft tissue mass in the region of the head and uncinated process of the pancreas (Figure 2 A&B). At the time of the outside CT exam, except for a vague abdominal pain, the patient did not have any laboratory or CT findings of biliary or pancreatic ductal obstruction. Subsequent MRI and MR cholangiography showed an unresectable pancreatic mass with compression of the distal common bile duct and tumor encasement of the superior mesenteric artery, replaced right hepatic artery, and superior mesenteric vein (Figure 2 C). MRI exam with the following endosonographic evaluation staged the pancreatic cancer as T4 Nx Mx. Endoscopic tissue sampling confirmed the diagnosis of pancreatic adenocarcinoma. Due to the aggressive pancreatic adenocarcinoma with its rapid clinical deterioration, the parathyroidectomy was postponed. The patient passed away, 22 months after the initial CT exam, due to the occurrence of complicated biliary and gastrointestinal tract obstruction along with widespread bilateral pulmonary metastasis.

99mTc sestamibi is the workhorse radiopharmaceutical for myocardial perfusion imaging and the scintigraphic evaluation of hyperparathyroidism. These two procedures have planar, SPECT or SPECT/CT imaging with the field of view including part of the chest and upper abdomen. The radiotracer biodistribution of thoracic and abdominal organs visualized during these procedures may provide important information about coexisting diseases potentially impacting the patient care (*1*-*3*). 99mTc sestamibi physiologic uptake is usually homogeneously diffuse in the hepatic parenchyma with often prominent activity in the gallbladder (*4*). In our case, the unusually conspicuous

intra and extra-biliary ducts scintigraphic features with distal common bile duct interruption lead to the retrospective detection of an overlooked pancreatic lesion and the subsequent diagnosis of an unresectable pancreatic adenocarcinoma.

CONCLUSION

Thorough evaluation of the planar, SPECT and SPECT/CT imaging of myocardial perfusion and parathyroid is useful in the detection of extra-cardiac and extra-cervical pathological processes.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

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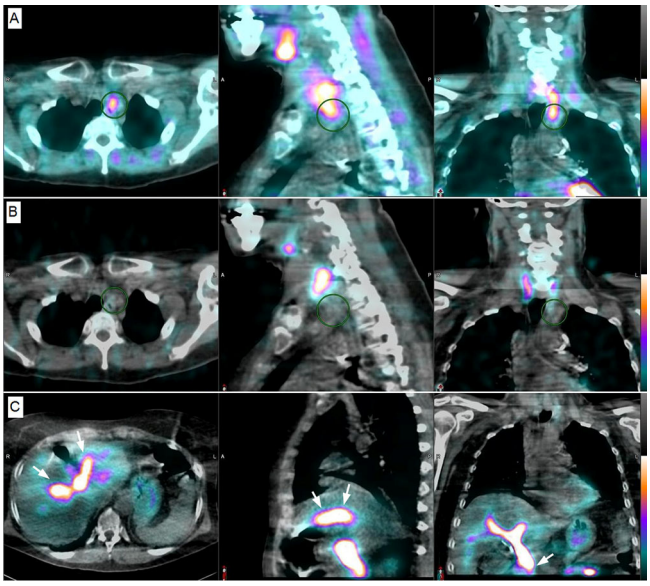

Figure 1: Axial, sagittal and coronal SPECT/CT images of the parathyroid scintigraphy showed a parathyroid adenoma in the left superior mediastinum positive with 99mTc sestamibi (Row A, circles) and negative with 123-I sodium iodide (Row B, circles). SPECT/CT also showed prominent tracer activity in the intra and extra-hepatic biliary ducts with cut-off sign at the distal common bile duct suggestive of obstruction (Row C, arrows).

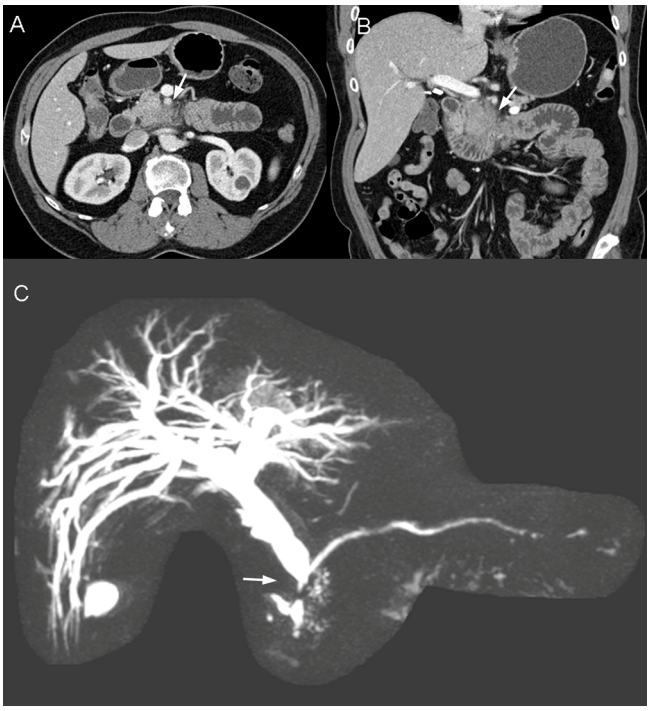

Figure 2: Review of a prior CT exam, performed two month prior to the parathyroid scan, showed soft tissue fullness of the head and uncinated of the pancreas suspicious for malignancy (A&B, arrows). MR cholangiography, following the parathyroid scan, confirmed the dilated biliary ducts from a progressing unresectable adenocarcinoma at the head of the pancreas with cut-off sign at the distal common bile duct (C, arrow).