18F-Fluorodeoxyglucose-Avid Mammary Mass in a Patient with Insulin-Dependent Diabetes Mellitus and Hodgkin's Lymphoma: Relapse or Pitfall?

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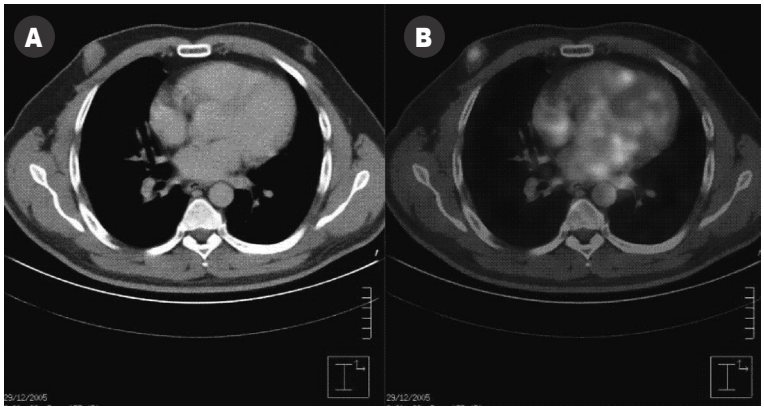
Diabetic mastopathy is an uncommon benign histopathologic condition manifested by a palpable mass. It typically occurs in premenopausal women with long-standing early-onset insulin-dependent diabetes mellitus and microvascular complications. It was first reported in 1984 by Soler and Khardori [1] in a series of 12 patients. Since then, over 200 cases have been described in the literature, mostly in women, diagnosed by mammography, ultrasound or magnetic resonance imaging [2-4].

^{18}F-fluorodeoxyglucose imaging with positron emission tomography in combination with computed tomography is a recently introduced technique mainly for the diagnosis, staging and follow-up of malignant conditions. However, it can sometimes be misleading especially when inflammatory benign conditions are involved [5]. We report here a male patient with IDDM and Hodgkins' lymphoma who developed a FDG-avid mass in his right breast several months after the completion of chemotherapy, posing a diagnostic dilemma.



[A] Transverse CT and **[B]** fused PET/CT images. There is an FDG-avid soft tissue mass in the right breast.

Patient Description

A 34 year old man presented with a painful right breast mass. He had a 16 year history of IDDM. Diabetic complications included proliferative retinopathy, nephropathy with proteinuria, and peripheral neuropathy. One year before, he was diagnosed with Hodgkin's lymphoma, nodular sclerosis type, stage IVB. PET/CT at diagnosis showed cervical lymphadenopathy and lung and bone involvement. He was treated with two courses of BEACOPP (bleomycin, etoposide, doxorubicin, vincristine, procarbazine, prednisone) and four courses of ABVD (doxorubicin, bleomycin, vinblastine, dacarbazine) according to the Israeli protocol for high risk patients. Glucose blood levels were difficult to control during the chemotherapy period, especially when corticosteroids were administered. A PET/CT scan, done after completion of the two courses of BEACOPP and at the end of treatment, showed no evidence of disease. Three months after the last chemotherapy session the patient complained of a painful palpable mass in his right breast. Physical examination revealed a 2 x 2 cm mass behind the nipple of the right breast

A mammogram revealed a mass lesion of 3.5 cm with irregular borders behind the right nipple, suspected of malignancy. Since the patient was scheduled for a routine scan for follow-up of the lymphoma, ^{18}F-FDG PET/CT was performed 1 hour after the intravenous injection of 370 MBq of ^{18}F-FDG and showed increased uptake of FDG in the right breast mass [Figure]. Excisional biopsy demonstrated fibrosis, lobular atrophy and lobular lymphocytic infiltrate of the breast tissue, compatible with diabetic mastopathy (lymphocytic mastitis). The patient was followed clinically without any intervention and the lesion resolved spontaneously with better control of the diabetes. A PET/CT scan several months later showed no uptake.

Comment

Diabetic mastopathy is a rare benign histopathologic condition that mimics cancer clinically and radiographically. It usually presents in premenopausal women with early-onset, longstanding and poorly controlled IDDM [1]. At the time of presentation, patients

IDDM = insulin-dependent diabetes mellitus
FDG = fluorodeoxyglucose
PET = positron emission tomography

often have diabetic microvascular complications [2], like our patient. The pathogenesis of diabetic mastopathy is not completely understood. It has been speculated to represent an autoimmune reaction to the abnormal accumulation of altered matrix in the breast secondary to persistent hyperglycemia [1,3]. Although rare, this condition was also reported in type II (late-onset) diabetic female patients treated with insulin and in patients with autoimmune thyroid disease [1]. Clinically, it presents as a rapidly growing hard mass in one or both breasts, as in our patient. Mammography in women typically shows dense breast tissue with or without a mass. Ultrasound usually reveals a hypoechoic mass with acoustic shadowing [4]. None of these techniques can distinguish this condition from malignant disease. There are some reports of the superiority of a dynamic contrast-enhanced MRI to mammography and ultrasound [2]. So far, there has been no report on 18F-FDG PET evaluation of this condition.

Fine-needle aspiration is inadequate for diagnosis because of insufficient sampling due to the fibrous nature of the lesion, and a core biopsy is usually recommended [3]. The histologic findings include dense fibrosis with lymphocyte infiltration, mostly of B cells [2,3]. About 60% of the lesions are bilateral, recurrent, or both [1,4].

The case presented here illustrates diabetic mastopathy developing in a man with IDDM who was under poor glycemic control aggravated by chemotherapy, mainly steroids. Since poorly controlled IDDM is thought to be a risk factor for the development of diabetic mastopathy, we assume that this was the trigger for its occurrence in our patient. Moreover, its disappearance several months later with better control of glucose supports this assumption.

This is the first documentation of the radiologic manifestations of this condition with PET/CT. We assume that the pathologic increased uptake of FDG in the mass representing diabetic mastopathy results from an inflammatory reaction, which is the basis of this complication. As the use of the PET/CT modality for imaging broadens, we should be familiar with the pitfalls of this modality. Since certain benign, mainly inflammatory conditions like diabetic mastopathy are associated with pathologic increased FDG uptake, tissue sampling may be needed to discriminate malignant from benign conditions.

References

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