A Case of Breast Cancer with Diabetic Mastopathy: Radiological and Pathological Correlation

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ABSTRACT
Diabetic mastopathy is a rare condition that occurs in young diabetic patients. The lesion may mimic a breast tumour because of its high degree of fibrosis and inflammation. This report describes a case of diabetic mastopathy in a 73-year-old woman who had diabetes mellitus and breast cancer. At presentation, ultrasonography of the right breast showed a 2.5-cm ill-defined multilobulated hypoechoic lesion with non-uniform internal echo. The left breast was normal clinically. The woman subsequently underwent modified radical mastectomy of the right breast; the histological diagnosis was invasive ductal carcinoma. During a routine follow-up visit one and a half years later, ultrasonography revealed 2 masses of 1 to 2 cm in the left breast. The patient was thus likely to have metachronous cancer in this breast. Localised excision using an ultrasound-guided hookwire was performed, and histological examination showed lymphocytic lobular mastitis, which was compatible with the diagnosis of diabetic mastopathy. Although diabetic mastopathy is a benign disease, it shares similar mammographic and ultrasonographic findings to those of carcinoma and thus requires histological confirmation.

Key Words: Breast diseases; Breast neoplasms; Diabetes mellitus, type 1; Ultrasonography

INTRODUCTION
Diabetic mastopathy is a rare disease that occurs in patients who have a long history of diabetes mellitus. At the time of presentation with breast symptoms, patients often have associated complications such as retinopathy, nephropathy, and neuropathy.1 Soler and Khardori2 first described this benign breast condition in 1984. The pathological features are similar to those of lymphocytic mastitis. Although some studies have attributed the changes to an autoimmune reaction to diabetogenic matrix accumulations, the exact pathogenesis of this condition has yet to be elucidated.

CASE REPORT
A 73-year-old woman with an 18-year history of poorly controlled insulin-dependent (type 1) diabetes mellitus presented to the Department of Radiology at the United Christian Hospital in June 2001 because she had noticed a palpable mass at the 12-o’clock position in her right breast. Physical examination showed a 4-cm hard mass over that area. There was no clinical evidence of axillary or supraclavicular lymphadenopathy. Neither skin dimpling nor peau d’orange was observed. The left breast was normal clinically. Mammography showed heterogeneous dense tissue in both breasts but no distinct tumour. Microcalcification and architectural distortion were absent (Figure 1). Ultrasonography revealed a 2.5-cm ill-defined multilobulated hypoechoic lesion with non-uniform internal echo at the palpable area (Figure 2). The presumptive diagnosis was carcinoma; however, diabetic mastopathy remained a differential diagnosis because of the concomitant diabetes mellitus. Core biopsy of the lesion was not completed because the lesion was too hard to penetrate. Hence, we performed localised excision biopsy of the mass using an ultrasound-guided hookwire. Histological examination of the biopsy sample revealed invasive ductal carcinoma (Figure 3). Modified radical mastectomy of the right breast was subsequently performed.
After surgery, the patient remained asymptomatic. During a routine follow-up visit one and a half years later, however, there were incidental sonographic findings of two masses in the left breast. No focal mass was palpable or seen in the mammogram. The two lesions detected by ultrasonography, each 1 to 2 cm large, were located at the 11-o’clock position of the left breast. They
were ill-defined heterogeneous hypoechoic masses that had distinct posterior acoustic shadowing. No increase in vascularity could be demonstrated (Figure 4). The patient was thus likely to have metachronous cancer in this breast. Again, core biopsy was difficult and inconclusive. Localised excision using an ultrasound-guided hookwire was performed. Histological examination showed lymphocytic lobular mastitis, which was compatible with the diagnosis of diabetic mastopathy (Figure 5).

**DISCUSSION**

Diabetic mastopathy (also known as diabetic fibrous breast disease) is an uncommon disease that occurs in patients with a long history of diabetes mellitus. It is more common among patients with insulin-dependent diabetes than among those with non–insulin-dependent disease. The duration of diabetes mellitus before the diagnosis of diabetic mastopathy has been reported to range from 6 to 37 years.1 Usually, patients younger than 40 years are affected.

Histological examination shows prominent lymphocytic ductitis, perivasculitis, and dense fibrosis in the stroma with thick bundles of collagen. Soler and Khardori2 attribute the abnormal collagen accumulation to an autoimmune reaction, although the exact pathogenesis is still unknown. The lesion typically presents as a firm, hard, and mobile breast mass, the contour of which may be irregular.3,4 The lesions may be multiple and may recur in different regions of the breast.5 Mammograms show dense breast tissue and, because of this density, a focal breast mass may not be seen,4,6 as was demonstrated in our case. In male patients with diabetic mastopathy, mammographic findings may suggest gynaecomastia only.6 Diabetic mastopathy may be visualised in mammograms as indeterminate masses, asymmetrical density, or ill-defined nodules with speculated in a background of radiodense tissue.3,4 The presence of a cluster of micro-calculations, however, would indicate carcinoma rather than diabetic mastopathy.7 Sonographically, the lesions show marked posterior acoustic shadowing and absence of Doppler signal.8 Magnetic resonance images reveal non-specific stromal enhancement.9

Both clinical examination and imaging studies cannot be expected to definitely differentiate between diabetic mastopathy and carcinoma. Our case illustrated this difficulty. The possibility of diabetic mastopathy was considered at the initial presentation, when the mass in the right breast was diagnosed to be cancer. A malignant tumour was subsequently expected in the non-palpable asymptomatic mass in the left breast, but diabetic fibrous disease was found histologically. Logan and Hoffman4 reported that 50% of fine-needle aspirates in their series contained insufficient cellular material to allow a definitive diagnosis. Hence, core-needle or excisional biopsy may be unavoidable. It must be emphasised that imaging is useful in establishing a diagnosis of diabetic mastopathy only after the exclusion of carcinoma.

**REFERENCES**