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## Original research

## Unusual breast lesion mimicking cancer: Diabetic mastopathy



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## ABSTRACT

Diabetic mastopathy represents an uncommon tumor-like proliferation of fibrous tissue of the breast that usually occurs in patients who suffered from type 1 diabetes mellitus for a long time. We report an uncommon case of diabetic mastopathy presenting in a type 2 non-insulin dependent diabetes mellitus 61-year-old postmenopausal woman. Physical examination revealed a hard, low movable mass in the upper outer quadrant of the right breast. Mammography and ultrasonography showed typical features of breast cancer. Ultrasound-guided fine-needle aspiration cytology (US-FNAC) was performed showing inflammatory infiltrate, suggesting excisional biopsy. Histological findings demonstrated typical diabetic mastopathy with fibrosis, histiocytic and lymphocytic infiltration without evidence of malignancy.

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## 1. Introduction

Diabetic mastopathy has been described as a clinicopathologic entity based on the presence of a benign fibrous disease in breast tissue in patients affected by type 1 diabetes. Recently few cases of diabetic mastopathy in type 2 diabetes mellitus patients have been reported [1–4].

Type 2 diabetes is a serious health problem that affects more than 7% of adults in developed countries. Up to 16% of patients affected by breast cancer suffers from diabetes and its two major risk factors - old age and obesity - are also associated with breast cancer. Comparative cohort studies and case–control studies suggest that type 2 diabetes may be associated with 10–20% excess relative risk of breast cancer [5].

Diabetic mastopathy represents less than 1% of benign breast lesions [2,6–8] presenting with hard, painless, irregular mass of the breast, clinically and radiologically simulating breast cancer. Misinterpretation of these masses may result in unnecessary mastectomies [6,9]. From a histological point of view, diabetic mastopathy includes lymphocytic ductitis and lobulitis with varying degrees of keloidal fibrosis, vasculitis, epithelioid fibroblasts,

and lymphoid nodule formation [2,4,7,10]. We report an uncommon case of diabetic mastopathy in a type II diabetes patient.

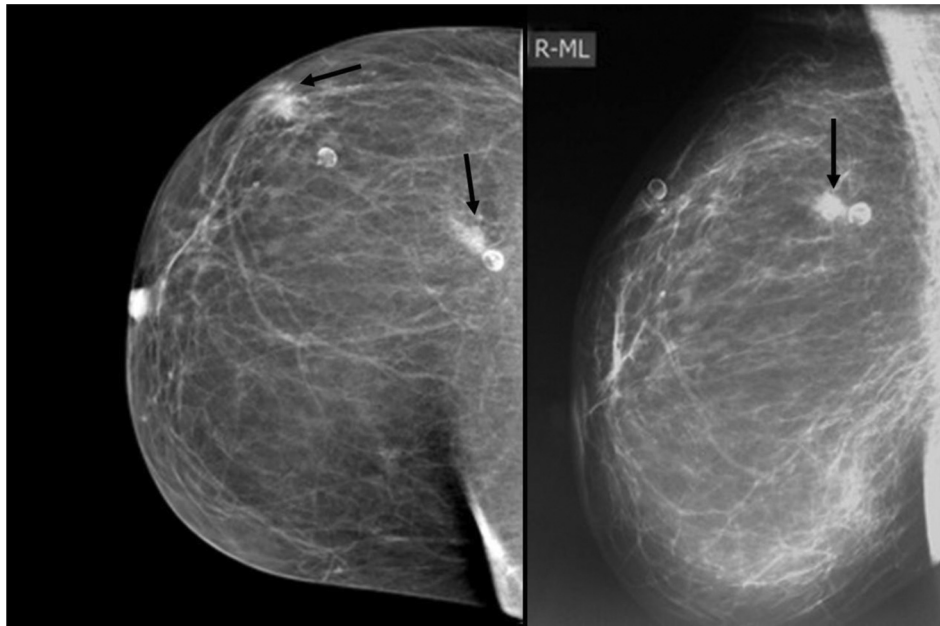
## 2. Case report

A 61-year-old woman, who was diagnosed with type 2 diabetes since 2006 presented to our attention for a palpable mass in the right breast. She had no microvascular or macrovascular diabetic complications and she was affected by hypothyroidism (Hashimoto thyroiditis) in treatment with levothyroxin. Blood sugar was 132 mg/dl while thyroid function tests were all within normal limits.

Physical examination revealed a hard, low movable mass in the upper outer quadrant of the right breast. Mammography showed a localized increased density with architectural distortion and spiculated margins, highly suspected for malignancy, in correspondence of the palpable mass (Fig. 1). In addition, it revealed the presence at the level of the outer quadrants of a further area of architectural distortion with similar characteristics, not palpable on physical examination due to its localization on deep planes. Dystrophic calcifications have been detected on both breasts, especially on the right breast, without clinical relevance. The architectural distortions required further investigations, being highly suspicious for malignancy.

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**Fig. 1.** Cranio-caudal and medio-lateral oblique mammographic view of the right breast. Two localized, increased density areas with architectural distortion and spiculated margins, highly suspicious for malignancy at the upper outer quadrant and external quadrant (arrows). Coarse nodular dystrophic calcifications without clinical relevance.

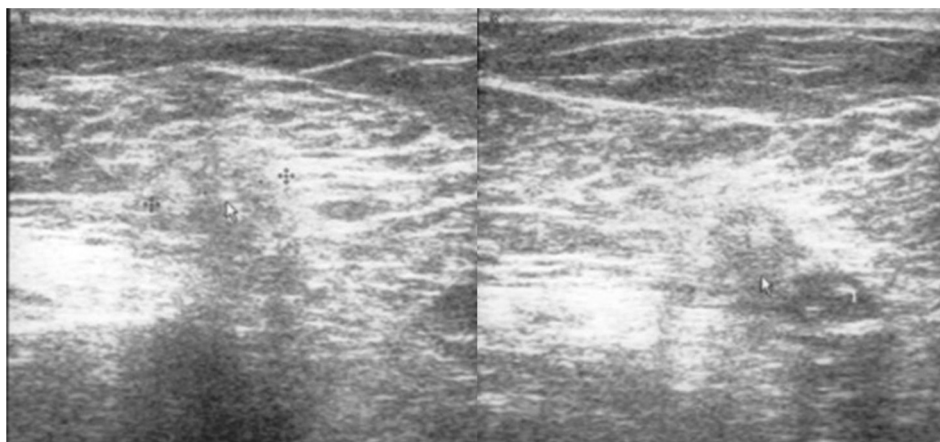
Ultrasonography revealed a hypo-isoechoic mass measuring 10x8,2 mm in diameter, with not clearly defined margins and marked posterior acoustic shadowing (Figs. 2 and 3) in the upper outer quadrant. The other lesion, on deep planes, on the outer quadrants showed similar characteristics, measuring 12 × 11 mm. Both lesions were suspected for malignancy.

US-FNAC was performed showing mature lymphocytes intermingled with histiocytes.

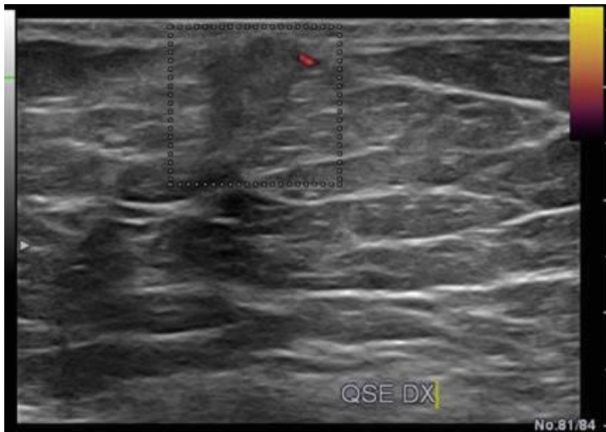
In February 2014, the two lesions were resected and sent to histopathologic investigation. An impression of malignancy was gained from the cut surface of the resected specimen but pathological findings showed that the lesions consisted of fibrotic breast stroma with prominent lymphocytic infiltrate (Figs. 4 and 5). The lymphocytes were composed predominantly of B-cells since they were immunohistochemically positive for CD20. A diagnosis of diabetic mastopathy was determined.

### 3. Discussion

Diabetic mastopathy is an uncommon tumor-like proliferation of fibrous tissue of the breast, clinically and radiologically mimicking breast cancer [11]. Since Soler and Khardori [1] first reported 12 cases of fibrous disease of the breast in association with longstanding type I diabetes mellitus in 1984, 168 cases of diabetic mastopathy have been reported [12]. Unusually the condition has also been observed in patients with type II diabetes mellitus and until 2006, twenty-five cases of diabetic mastopathy have been reported [13]. This condition is also found in patients with other endocrine disorders, especially thyroid diseases [2,7,9]. From 2006 to nowadays other cases have been reported [13,14] but among all of them, only a few suffered from non-insulin dependent diabetes. Our patient was affected by type 2 diabetes mellitus and Hashimoto's thyroiditis with hypothyroidism in treatment. Diabetic



**Fig. 2.** Ultrasonography of the right breast (external quadrants) revealed a heterogenous hypoechoic area with indistinct margins and posterior acoustical shadowing, suggestive for malignancy (12 × 11 mm).



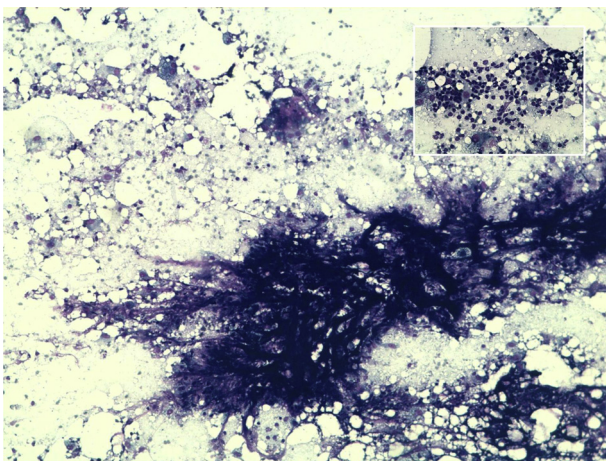
**Fig. 3.** Ultrasonography of the right breast (upper outer quadrant) revealed a heterogeneous hypoechoic area with an indistinct margin, posterior acoustic shadowing and vascular pole on Doppler, suggestive for malignancy (10 × 8, 2 mm).

mastopathy involves a hard, irregular, low movable, nontender, single or multiple, unilateral or bilateral mass [13]. Seidman et al. [7] reported a diabetes mean duration of more than 13 years (range 4–27 years) for diabetic mastopathy to develop. In our case, the patient was affected by diabetes since 2006 (8 years of disease). Usually, mammographic appearances show the presence of a dense parenchymal structure with no distortions or microcalcifications [8,15,16]. In our case, mammography showed an age-related lobular involution with a focal area of architectural distortion without microcalcifications. Coarse dystrophic calcifications were reported with no clinical relevance.

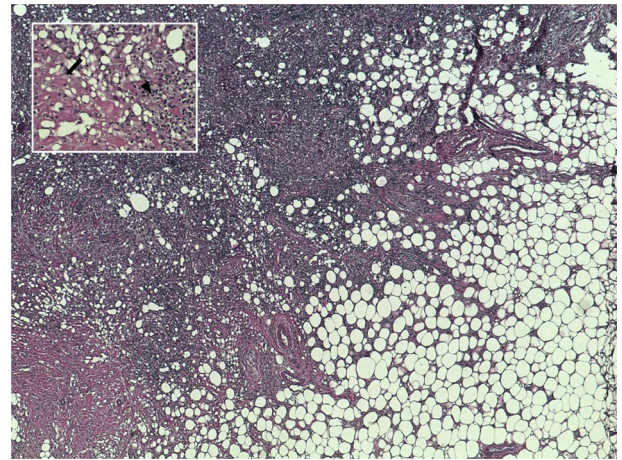
Ultrasound findings vary from irregular hypoechoic mass with marked acoustic shadowing to a vague hypoechoic area without shadowing [8,15,16]. In our case, ultrasonography showed malignancy findings with irregular iso-hypoechoic mass with marked posterior shadowing.

Magnetic resonance imaging (MRI) findings vary from no enhancement to slight heterogeneous enhancement of the mass [17] and are non-specific, mimicking those of breast cancer.

Histologic findings are necessary for the diagnosis of diabetic mastopathy. Additional data from the literature show that approximately half of lesions are bilateral or recurrent or both [4,15]. With reference to recurrence, Camuto et al. [15] reported



**Fig. 4.** Cytology. Stromal fragment in a background with histiocytes and lymphocytes. No ductal cells are observed (May-Grunwald-Giemsa stain, 10×). In the inset, a high power view of mature lymphocytes intermingled with histiocytes (May-Grunwald-Giemsa stain, 20×).



**Fig. 5.** Histology. Fibrotic breast stroma with prominent lymphocytic infiltrate; lobular structures are almost completely absent (haematoxylin and eosin, 10×). Note plump fibroblasts in the stroma (inset, arrow) and the inflammatory infiltrate with lymphocytes and histiocytes (inset, arrow head) (haematoxylin and eosin, 20×).

that about 60% of diabetic mastopathy tends to recur after surgical excision in the same location and involves more breast tissue than the previous lesion and surgery should not be considered. This suggests that the natural history of diabetic mastopathy involves a multicentric field effect of diabetes on breast tissue.

Specific histopathologic characteristics of diabetic mastopathy include keloidal fibrosis, epithelioid fibroblasts, widespread perivascular/lobular lymphocytic infiltration, and widespread perivascular lymphocytic infiltration [2]. The frequency of these four features is approximately 60–70% [4,7] and they are relatively specific for insulin-requiring diabetes mellitus. Epithelioid fibroblasts are not necessary for the diagnosis of diabetic mastopathy [2] as they were also seen in patients without a diabetic history [3,4]. Lymphocytic infiltration consists predominantly of B-cells, in contrast with non-diabetic mastitis in which lymphocytic infiltration consists mostly of T-cells [2]. Although the pathogenesis remains still obscure and could be multifactorial, it is generally believed that these lesions are attributable to extracellular matrix expansion secondary to increased collagen production and decreased degradation, in part related to the hyperglycemic state [2]. Another suspected reason is represented by autoimmune reaction, firstly suggested by Soler and Khardori [1] showing lymphocytic infiltration for B cells [1,2,4,8].

#### 4. Conclusions

In conclusion, we should be aware of diabetic mastopathy when we encounter breast mass in patients with both type 1 and type 2 diabetes mellitus. Because the findings of diabetic mastopathy by physical examination, mammography, ultrasonography and MRI are non-specific and mimic those of breast cancer [19,20], histological examination is mandatory. There is no evidence to suggest that diabetic mastopathy predisposes to the development of breast carcinoma or stromal neoplastic disease [21] so if typical histological features of diabetic mastopathy exist at core biopsy, surgery should be avoided because of the tendency for recurrence.

#### Ethical approval

Ethical approval was not necessary, since the patient in the study has been treated according to guidelines and no experimental procedures or medications have been used.

### Author contribution

**Antonello Accurso:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

**Giovanni Antonio Della Corte:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Nicola Rocco:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Valeria Varone:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Riccardo Buonaiuto:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Rita Compagna:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Daniele Ugo Tari:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Bruno Amato:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Albina Riccardi:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

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### Conflicts of interest

All Authors have no conflict of interests.

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