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Case Report

Surgery Section

Diabetic Mastopathy Mimicking Malignancy: A Surgical Perspective on Diagnosis and Management

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ABSTRACT

Diabetic Mastopathy (DMP) is an uncommon benign fibroinflammatory condition of the breast, predominantly seen in individuals with long-standing diabetes mellitus. It often mimics malignancy on clinical and radiological examination, leading to diagnostic uncertainty. DMP accounts for 0.5-13.5% of all benign breast lesions. Here, authors present the case of a 48-year-old postmenopausal female who presented with complaints of serous, cheesy discharge of minimal quantity from the right nipple, intermittently for the past 10 years, along with pain over the right breast for the last four weeks. Clinical evaluation revealed a firm, tender subareolar mass with nipple-areola distortion and cheesy discharge. Imaging via sonomammography revealed a Breast Imaging Reporting and Data System 3 (BIRADS 3) hypoechoic lesion with cystic areas and ductal dilatation. A wide local excision, including the removal of the distorted nipple-areola complex, was performed. Gross and histopathological examination showed fibrocystic changes with dense fibrous stroma, lymphoplasmacytic infiltration and giant cells, consistent with DMP. Close clinical follow-up is essential. Heightened clinical awareness and individualised treatment strategies can help minimise unnecessary surgeries while ensuring patient safety and reassurance.

Keywords: Benign breast disease, Case report, Lymphoplasmacytic infiltration, Recurrence, Wide local excision

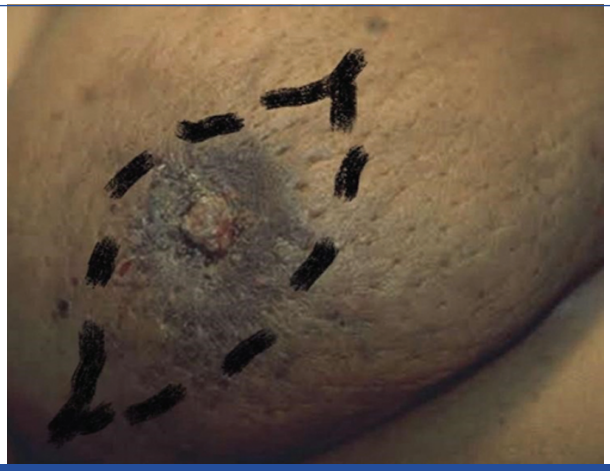
CASE REPORT

A 48-year-old postmenopausal female presented with complaints of serous, cheesy discharge of minimal quantity from the right nipple, intermittently over the past 10 years and pain in the right breast for the last four weeks. She was diagnosed with type 2 diabetes mellitus three years prior and was being treated with insulin and oral hypoglycaemic agents (OHAs). Her HbA1c level was 9.2%, indicating poor glycaemic control. Autoimmune markers, including anti-GAD (anti-glutamic acid decarboxylase), were positive. She also had a six-year history of hypertension and was on regular medications. Additionally, she had hypothyroidism and was on T. Thyroxine 25 µg once daily. She had a history of ischaemic heart disease and attained menopause five years ago. Her obstetric history included one pregnancy, one live birth, a full-term, Lower Segment Caesarean Section (LSCS), with the last childbirth occurring 26 years ago. There were no other significant symptoms besides the breast symptoms.

Her mother was known to have had carcinoma of the esophagus, but details were not available. There was no significant family history of breast carcinoma or other autoimmune diseases. The patient had not sought medical consultation for her breast symptoms in the past due to hesitance in going to the hospital.

On clinical examination, a firm, tender lump measuring 5×3 cm was palpable just below the right nipple, with distortion of the nipple-areola complex [Table/Fig-1]. A thick, minimal, cheesy discharge was expressed upon gentle pressure. The skin was free and mobile, with no fixity and no axillary lymphadenopathy was noted. The left breast was unremarkable. Sonomammography showed a BIRADS 3 hypoechoic lesion with tiny cystic components in the outer quadrant of the right breast [Table/Fig-2,3]. Dilated subareolar ducts with non mobile luminal material were noted, causing retraction of the nipple. Magnetic Resonance Imaging (MRI) was not performed due to the patient's unwillingness.

The patient underwent wide local excision of the lump, including the distorted nipple-areola complex, under general anaesthesia. Intraoperatively, a firm, fibrotic mass was observed, adherent to surrounding ducts [Table/Fig-4,5]. No axillary dissection was performed due to the absence of lymphadenopathy. The patient

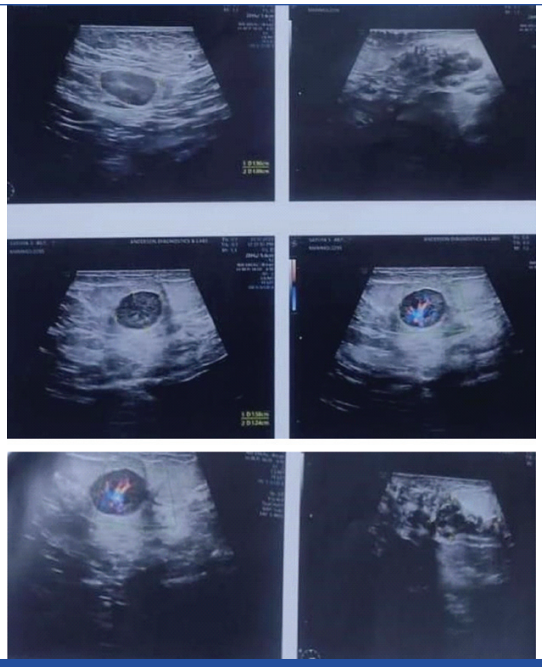


[Table/Fig-1]: Pre operative Clinical image of the right breast demonstrating a retro areolar mass with distorted nipple areola complex.

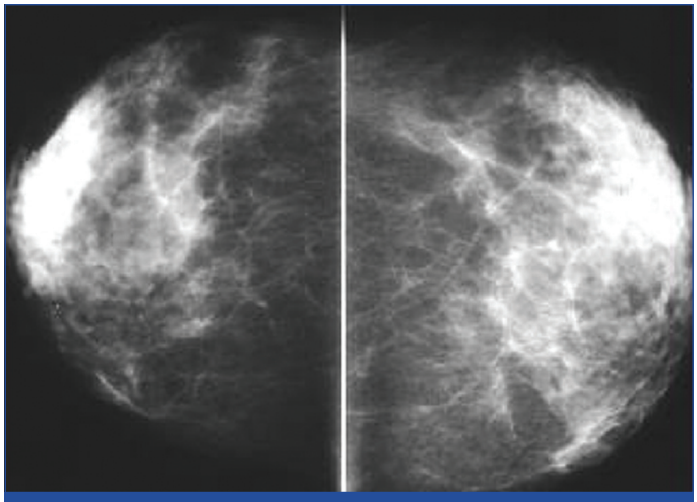
tolerated the procedure well. Postoperatively, she was treated with intravenous fluids, analgesics and proton pump inhibitors. She was discharged on postoperative day 5 with no complications. The patient was placed on a six-monthly ultrasound follow-up with no suspicious features of malignancy noted.

A wide local excision specimen was received, comprising a right breast lump along with an elliptical portion of overlying skin and nipple, measuring 8.0×6.0×2.5 cm. The skin and nipple appeared grossly unremarkable. Upon sectioning, a well-defined lump measuring 5.0×4.0 cm was identified. The cut surface revealed a grayish-white area interspersed with multiple unilocular, thick-walled cysts containing blood-stained purulent material. The remaining breast parenchyma and adjacent fatty tissue appeared grossly unremarkable.

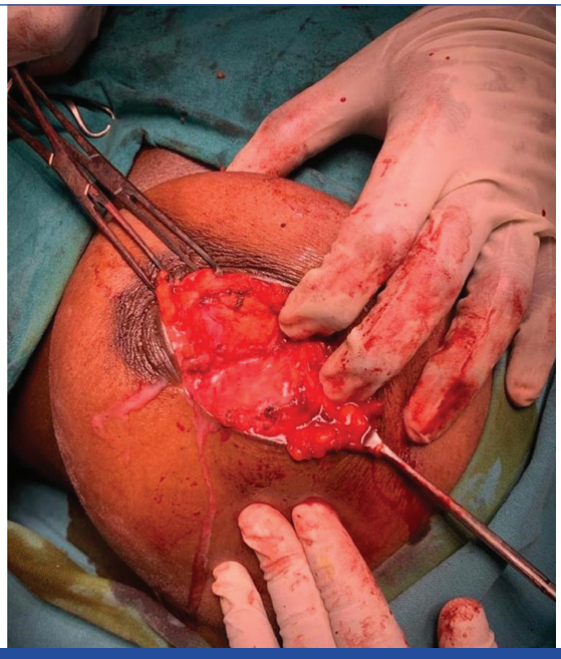
Histological examination of multiple sections from the lump, including solid and cystic areas, revealed features of fibrocystic changes with apocrine metaplasia and many ducts contained eosinophilic secretions. Additionally, there were moderate to dense infiltrates of mature lymphocytes in periductal, perilobular and perivascular areas, accompanied by occasional plasma cells, keloid-like fibrosis



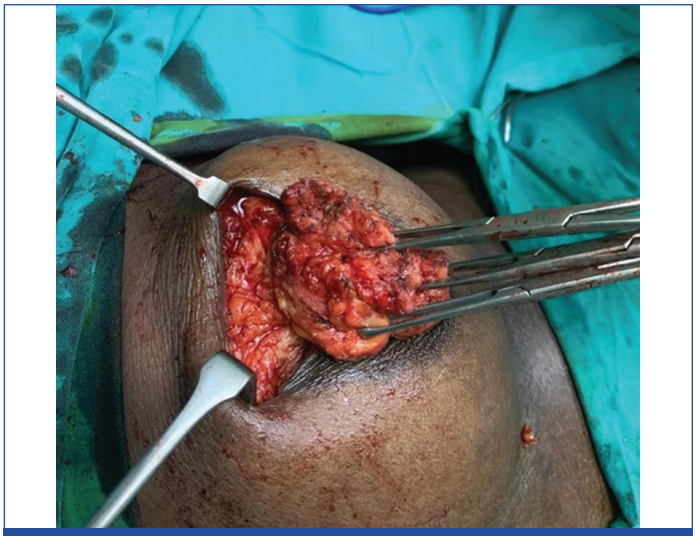
[Table/Fig-2]: a,b) Sonomammogram of both breasts done showed dilated ducts associated with wall thickening and filled with heteroechoic non mobile luminal contents in right subareolar region nipple retraction - BIRADS III. Hypoechoic lesion with tiny cystic components in the outer quadrants of the right breast enlarged intramammary lymph node - BIRADS III.



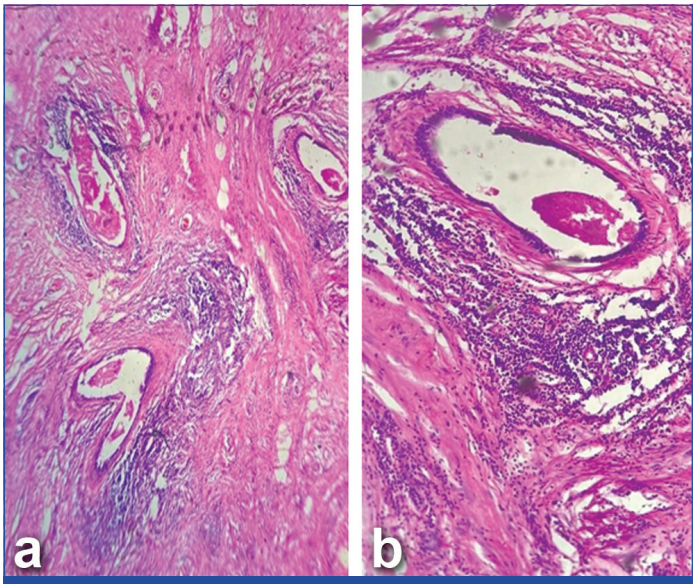
[Table/Fig-3]: Mammogram right breast showing asymmetric densities.



[Table/Fig-4]: Intraoperative image showing a retroareolar lump with cheesy material exudating.



[Table/Fig-5]: Intraoperative specimen retrieval of retroareolar mass.



[Table/Fig-6]: a) Dense fibrous stroma with lymphoplasmacytic infiltration and giant cells: b) Fibrocystic changes with apocrine metaplasia (H&E, X40).

and epithelioid myofibroblasts. The cyst wall was composed of fibro-collagenous tissue, densely infiltrated by polymorphonuclear cells, lymphocytes, plasma cells and a few multinucleated foreign body-type giant cells [Table/Fig-6]. Sections from the surrounding adipose tissue were unremarkable and no pathological changes were identified in the skin or nipple; specifically, there was no evidence of Paget's disease or epithelial atypia. Special stains for acid-fast bacilli and fungal organisms were negative. No evidence of malignancy was identified in the examined material.

DISCUSSION

DMP is a rare fibroinflammatory condition of the breast, a complication of diabetes mellitus that mimics malignant processes but is neither premalignant nor malignant in nature [1], accounting for 0.5-13.5% of benign breast lesions [2]. It is most commonly observed in premenopausal or perimenopausal women with long-standing type 1 diabetes mellitus, although it has also been reported in type 2 diabetics and even in males. The pathogenesis of DMP remains unclear but is believed to involve chronic hyperglycaemia, insulin resistance, autoimmune responses and connective tissue remodeling [3]. It might be due to biochemical alterations in the extracellular matrix resulting from prolonged hyperglycaemia, leading to dense fibrotic stroma [3].

Tomaszewski JE et al., identified specific microscopic features [4], such as epithelioid cells within the fibrous stroma, particularly associated with insulin-dependent diabetes mellitus (IDDM). Seidman JD et al., later elaborated on diagnostic criteria, highlighting keloid-like

Author	Age/sex	Patient profile	Diabetes Mellitus	Presentation and Imaging
Mariano L et al., [11]	Most commonly affects women aged 20-40 years; rare in men. Case examples: 39-year-old female, 37-year-old female, 62-year-old female	Typically, premenopausal, with a long-standing history of Type 1 diabetes mellitus (often 20+ years). May have diabetic complications like nephropathy, retinopathy and neuropathy	Most cases involve Type 1 DM, but can occur with Type 2 DM or even in non diabetics. Strongly associated with insulin therapy	Presents as painless, hard, irregular, movable breast masses. Imaging (mammography, ultrasound, MRI) often mimics breast carcinoma: ill-defined, hypoechoic lesions with posterior shadowing; BI-RADS 4b/4c.
Neetua G et al., [12]	36-year-old Chinese female	Premenopausal woman with a history of type 1 diabetes for 7 years, diabetic retinopathy, rheumatoid arthritis (12 years) and thyrotoxicosis (4 years). Also, on steroids and antithyroid medications	Type 1 Insulin-Dependent Diabetes Mellitus (IDDM); complications include retinopathy and other autoimmune conditions	Presented with a 2-month history of a hard, painless, relatively immobile left breast lump (~5 cm) with no axillary lymphadenopathy. Imaging (mammogram + ultrasound) showed subareolar dense mass, hypoechoic, ill-defined, BI-RADS: indeterminate, with suspicion of malignancy.
Guzik P et al., [13]	41-year-old woman	History of type 1 diabetes mellitus, with co-existing autoimmune thyroiditis (Hashimoto's disease). No personal or family history of breast carcinoma	Type 1 diabetes mellitus for 20 years, on insulin therapy, poorly controlled HbA1c=8.2%	Presented with a palpable, painless, firm mass in the upper outer quadrant of the left breast. Ultrasound: irregular, hypoechoic mass, with posterior acoustic shadowing, BI-RADS 4A. Mammography: ill-defined density.
Chen X-X el al., [14]	69-year-old female	Elderly woman from Asia; unemployed; no personal or family history of breast cancer	Type 2 diabetes mellitus for 20 years; on insulin (Humalog 25R) and voglibose; poor glycaemic control (HbA1c: 8.3%)	Presented with painless bilateral breast masses; ultrasound and MRI suggested malignancy (BI-RADS 4B & 4C); no axillary lymphadenopathy noted.
Wood E and Propeck P [15]	57-year-old female	History of Type 2 Diabetes Mellitus for 10 years; on Metformin; well-controlled glycaemia (HbA1c: 7.5%); no history of trauma or breast pain	Type 2 DM; controlled with oral medication (Metformin)	Presented with a new palpable breast lump; Mammography showed a developing global asymmetry (5.8×5.3 cm) in the right upper outer quadrant; Ultrasound revealed diffuse hyperechoic changes without posterior shadowing—an atypical appearance for diabetic mastopathy.
Present study	48-year-old postmenopausal female	Co-morbidities: Type 2 Diabetes Mellitus, Hypothyroidism, Ischaemic Heart Disease. Family history: Mother had carcinoma oesophagus (details unavailable), no history of breast cancer or autoimmune disease	Type 2 Diabetes Mellitus -HbA1c: 9.2% (poor glycaemic control) -On insulin and oral hypoglycaemic agents -Positive anti-GAD antibodies (autoimmune marker)	Nipple -Recent onset of right breast pain (4 weeks) -Firm, tender subareolar lump (5x3 cm) with nipple-areola distortion -No axillary lymphadenopathy Imaging: Sonomammography: Hypoechoic lesion with ductal dilatation, cystic components, nipple retraction (BIRADS III) -Enlarged intramammary lymph node -No MRI (patient declined).

[Table/Fig-7]: Summary of few similar cases from literature [11-15].

fibrous stroma, increased stromal spindle cell density and clustered mature lymphocytes around small blood vessels, lobules and ducts [5]. Clinically, patients present with a painless or tender breast mass, often raising concern for malignancy. Discharge, as seen in this case, though uncommon, may be present. Imaging findings are non specific. Mammography often shows dense breast tissue, while ultrasound may reveal hypoechoic masses with posterior shadowing [6]. MRI may help delineate the extent of the lesion, but it is not pathognomonic [7]. Definitive diagnosis requires histopathological confirmation. Fine Needle Aspiration Cytology (FNAC) is usually non diagnostic due to dense fibrosis [8]. Core needle or excisional biopsy is preferred.

Management is typically conservative, with surgery reserved for diagnostic confirmation or symptomatic relief. The recurrence rate ranges from 40-75%, with potential for bilateral involvement [9]. Therefore, close clinical follow-up is essential. A six-monthly sonomammogram for the first year postsurgical excision, followed by annual follow-up, is necessary. Differential diagnoses include breast carcinoma, fibrocystic changes, duct ectasia and chronic abscess [10]. A summary of a few similar cases is presented in [Table/Fig-7] [11-15].

CONCLUSION(S)

This case underscores the importance of considering DMP in the differential diagnosis of suspicious breast lesions in diabetic patients. Histopathological examination is essential for diagnosis. Although benign, its clinical and radiological overlap with malignancy may lead to overtreatment. Long-term surveillance is recommended due to the risk of recurrence.

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