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Original Article

A surprising incidence of mammary duct ectasia in Egyptian female individuals: A 20-year experience

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Abstract

The vast majority of breast pathology is benign. Much attention is given to malignant lesions because breast cancer is the most common malignancy in women. Duct ectasia is one of the benign breast diseases; Haagenson was the first to use the term. It is a widening of the ducts of the breast, a condition that occurs most frequently in women in their fourth and fifth decade of life. American Cancer Society states that mammary duct ectasia does not increase the risk for developing breast cancer, as duct ectasia is considered a nonproliferative disease (cells that have changed but are not duplicate or spreading in an uncontrolled way). If left untreated, it can eventually lead to the obliteration of the breast ducts, with abscess formation. At an early stage, the ducts dilate, in which they may contain cholesterol crystals, calcification, and protein, which in turn produce an inflammatory reaction, ending by nipple discharge. In this study, and through assembling data from patients who visited our breast unit in 20 years, we found that more than 62% of patients with benign breast lesions are suffering from duct ectasia. Therefore, because of this surprising incidence, we recommend paying more attention to this disease, and the methods of diagnosis and treatment, especially the surgical one, as the operative technique is a very tedious one, as we will describe.

Keywords: Breast cancer, duct ectasia, nipple discharge

Introduction

The female breast is a very complex organ. The word 'Breast' refers to the mammary glands, which are modified sweat glands, plus the additional connective tissue and fat that surround and support the glands [1–4]. It begins to develop at 6 weeks. At birth, only the lactiferous duct grows, complete breast development occurs between 9 and 16 years, estrogen and progesterone cause stromal and terminal duct lobular unit growth. Each breast is formed by around 15–22 ducts, arranged radially around the areola with fat tissue around. Lobes consist of multiple lobules, each with an associated intralobular duct. Intralobular terminal ducts from the smaller lobules drain milk into the ductal system, once the milk exits the lobule, it enters the extralobular duct. The main ducts drain the milk from each breast lobe; the ducts form a pyramid shape, ending at the areola/nipple complex in a radial manner. Widening of the distal end of each of the main ducts is referred to as ampulla [5].

The ductal system is lined with two layers of low cuboidal epithelial cells with specialized luminal borders and basal contractile myoepithelial cells [6,7].

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Normal ducts in a nonlactating female should measure less than 2 mm in diameter and increase in size closer to the nipple, while normal ducts in a lactating female individual should measure less than 8 mm in diameter.

Benign breast disorders are liable to occur because of multiple factors including hormonal disturbance or therapy, infection, or even by age.

Benign breast conditions include fibrocystic changes, fibroadenomas, duct ectasia, mastitis, calcification, hyperplasia, adenosis, intraductal papillomas, and breast lipomas.

As regards duct ectasia, there are two theories for pathogenesis; 'Higginson' suggested that retroareolar ducts distended with cellular debris and lipid materials cause duct dilatation, periductal mastitis (PDM), and fibrosis, while others suggested that PDM is the initial process causing fibrosis then ductal dilatation [8].

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Mammary duct ectasia (MDE) is usually asymptomatic in the initial phases [9]. The most common presentation is sticky multicolored nipple discharge (serous, yellowish, creamy, greenish, dark brown, or bloody). Moreover, it may be present with noncyclic breast pain 'Mastalgia,' slit-like nipple retraction and/or retroareolar masses, which may be tender if complicated with abscess formation (Fig. 1).

Tests for radiographic features of MDE include (i) bilateral breast ultrasound (US), which reveals dilated main ducts (>2 mm diameter); fluid fills the main retroareolar ducts with or without moving echogenic particles (debris). (ii) MRI, in which, on T1 and T3 weighted images, it appears as dilated increased signal intensity branching ducts. (iii) Mammography helps mainly in the detection of any calcifications.

The approach toward MDE is usually conservative, as it can sometimes be associated with infection; if this occurs, the patient must receive antibiotics against both aerobic and anaerobic bacteria for at least 6 weeks. Surgical intervention is indicated for patients in whom medical treatment has failed, in which ducts were not returned to their usual caliber, patients with recurrence symptoms, or for patients with nipple retraction, with or without an underlying suspicious mass [10,11].

Patients and Methods

This study was held at the 'Breast Unit' at Mataria Teaching Hospital, Cairo, Egypt, over a period of 20 years, between January 1997 and January 2017.

The Outpatient clinic of Breast Unit receives about 10 female patients (as an average) every week, this implies around 500 patients every year. The study was performed on 10 183 Egyptian female patients; their age ranged between 15 and 77 years (average: 45 years).

Retrospectively, all data were assembled and analyzed according to the patients' complaints, bilateral routine breast physical examination, complete history of the previous breast complaints, and family history was recorded, and some laboratory and radiological investigations. Some patients – when needed – were investigated by bilateral mammography with US, MRI, cytological examination for any nipple discharge, and fine-needle aspiration cytology, or true-cut biopsy for any lump detected, benzidine test – when the discharge was bloody –, culture and sensitivity for the discharge, serum prolactin level, and CA15.3 level.

As regards distribution of data, patients were divided into three main groups:

First group: patients suffering from benign breast lesions, which represents about 80.2% (n = 8167). Second group: patients suffering from malignant lesions, which represents about 15.3% (1558 patients). Third group: those who had no breast diseases, which represents about 4.5% (458 patients) (Diagram 1).

By focusing on the first group, which includes patients suffering from benign lesions, they were redistributed – after definitive diagnosis – into four subgroups:

First subgroup: patients suffering from duct ectasia, which represents about 62.9% (n_1 = 5140). Second subgroup: patients having fibrocystic disease, which represents about 15% (n_2=1223). Third subgroup: patients with fibroadenomas, which represents about 11.1% (n_3=907). The fourth subgroup consists of all other patients suffering from any other benign disorders including lipomas, Intraductal papillomas, cysts, tuberculosis granuloma, atypical ductal hyperplasia, phylloidous tumors, and fat necrosis), which represents about 11% (n_4=906) (Diagram 2).

As regards patients diagnosedwith duct ectasia, patients' criteria include: age, which ranged between 21 and 73 years (with an average age of 47 years), the side of the affected breast (whether unilateral or bilateral), in addition to their marital status, and whether they were planning to have more children and subsequent lactation. All patients directed to surgery for major duct excision were informed that they would not lactate anymore from the operated side, and written consent was received before surgery.

The management protocol of patients with MDE is summarized in Fig. 2.

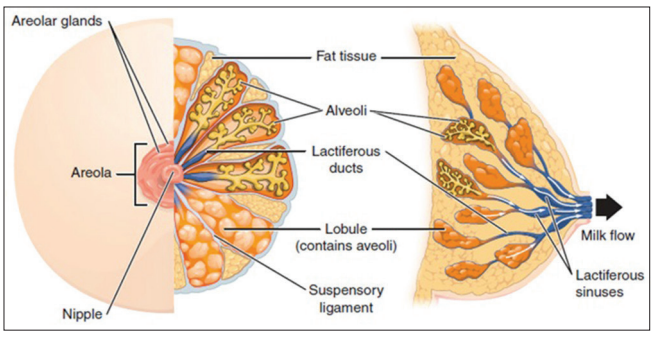
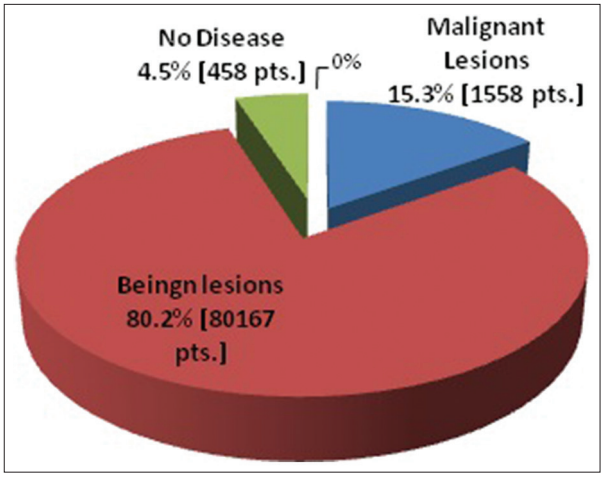


Figure 1: Anatomy of the breast and its ductal system.



Daigram 1: Incidence of breast diseases.

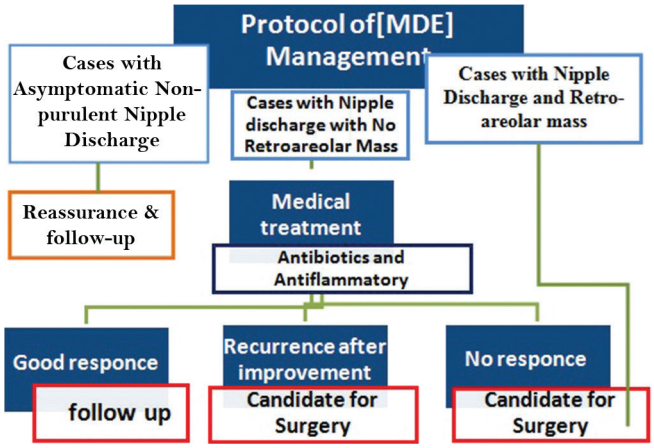


Figure 2: Protocol of mammary duct ectasia management.

For patients with asymptomatic nonpurulent nipple discharge [662 (12.3%) patients], reassurance and follow-up were quite enough. Moreover, 1762 (41%) patients responded to medical treatment, and the rest were directed to surgery.

Operative technique

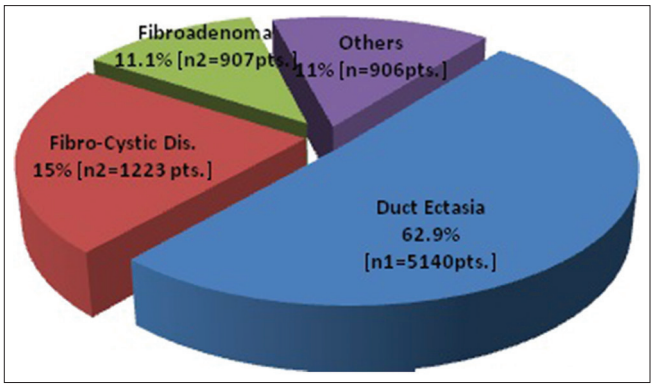
(1) All patients were assessed medically before the operation
(2) General anesthesia was administered to all patients, and prophylactic antibiotic was given before skin incision
(3) Patients were placed in the supine position, and the breast skin was sterilized
(4) A circumareolar incision less than half of the circumference of the areola was made
(5) Rising of the areola was carried out cautiously, to avoid injury of both the blood supply and the nerve supply to the areola/nipple complex, as any injury of the blood supply can cause necrosis and loss of this complex. Moreover, injury to the nerve supply may lead to loss of sensation of the areola and the nipple
(6) Major ducts were identified and sharply separated from the areola and the nipple, down to the end of visible duct tissue as a cone, with preservation of fat lobules in between to preserve the breast contour
(7) Palpation of the rest of the operative field was carried out, to detect any suspicious masses
(8) Closure of the retroareolar space to prevent nipple retraction
(9) Closure of the wound in two layers, subcutaneous and subcuticular, using absorbable '000' vicryl sutures, with the drain left in the surgical bed.

On reviewing specimens' pathological examination reports, they revealed MDE and PDM with foamy histiocytes, macrophages, and plasma cells.

Major duct excision is a tedious operation, as leaving out any duct will lead to a high rate of recurrence; moreover, injury to the blood supply of the areola/nipple complex will end by necrosis.

Results

This study was performed retrospectively on 10 167 female



Daigram 2: Incidence of benign breast lesions.

Egyptian patients, complaining of unilateral or bilateral breast symptoms. After analyzing all data, including patients' complaints, history taken, clinical examination, laboratory and radiological reports, and cytological and pathological results, we concluded that most of the breast disorders were benign (>80%). Moreover, duct ectasia represents around 52% of all benign lesions, which was a surprising percentage, compared with the international percentage. The average age was around 47 years (patients were aged between 21 and 73 years). Most patients were affected bilaterally, and about 65% of them received medical treatment, wherein only 41% gave a perfect response, and the rest were directed to surgery after failure of medical treatment; some passed directly to operation.

During repeated follow-up visits, 20 patients suffered from wound infection, which gave an excellent response to antibiotic treatment. Moreover, four patients had a recurrence of symptoms; the surgeons had to redo the surgery successfully.

Discussion

MDE is a widespread benign breast condition that we face daily in breast clinics. PDM, plasma cell mastitis, comedomastitis and mastitis obliterans are different stages of MDE and not different diseases [12-14]. It affects women at any age, with higher incidence at age over 35 years. Nipple discharge and noncyclic mastalgia are the main symptoms that patients complain of. Moreover, nipple retraction, tender retroareolar mass or sometimes nonpuerperal mastitis and abscess can be associated with the course of the disease. On examination, there is serous, yellowish, cream y, greenish, dark brown or rarely bloody nipple discharge that appears by squeezing the nipple. Moreover, slit-like nipple retraction, palpable tender retroareolar mass and even redness and hotness can be seen in some cases. US examination shows dilated ducts, with or without debris inside the ducts, sometimes a complicated cyst or abscess was detected in few cases.

Cytological examination of the discharge coming from the nipple is very crucial to confirm the diagnosis and to exclude malignancy. Fine-needle aspiration cytology or true-cut

biopsy is also essential in some cases that are associated with retroareolar mass. All the specimens must undergo histopathological examination to confirm the diagnosis, and to exclude malignancy.

Every patient must receive a personalized management protocol according to her case; for patients presenting asymptomatic nonpurulent nipple discharge (without any suspicious masses), reassurance is quite enough, with follow-up every three months. Patients with nipple discharge and mastalgia, medical treatment in the form of ciprodiazole (500 mg·every 12 h) and NSAIDs once daily for 4 weeks or until a resolution are advised. Patients showing no response, or recurrence of symptoms after medical treatment, together with patients having retroareolar masses, or complicated cysts or abscess are candidates for surgery.

Conclusion

On the basis of retrospective analysis of data collected from 10 167 Egyptian female patients, the results show that MDE is a prevalent breast disease in Egyptian female individuals, with a surprisingly high incidence rate. Therefore, we present this study to highlight this disease and to recommend giving more attention to this disease as regards the methods of diagnosis and treatment.

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Conflicts of interest

There are no conflicts of interest.

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