Clinicopathological Study of Mammary Duct Ectasia

Essay

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in **General Surgery**

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بسْمِ اللّهِ الرّحمَنِ الرّحيمِ

(...رَبِّ أَوزِعنِي أَن أَشكُرَ نِعمَتَكَ
الّتِي أَنْعَمْتَ عَلَيَّ و عَلى والِدَيَّ

و أَنْ أَعْمَلَ صَالِحاً تَرْضَاهُ و أَدْخِلْنِي
بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ)

صدق الله العظيم

النمل.. اية رقم ١٩

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Ahmad.M. Aboelkassem, ٢٠١٢

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List of Abbreviations

ADH	Atypical ductal hyperplasia
BI-RADS	Breast Imaging Reporting and Data System
BSGI	Breast-specific gamma imaging
CBE	Clinical breast examination
CT	Computed tomography
CNB	Core needle biopsy
CC	Craniocaudal
CK	Cytokeratins
CE-MRI	Contrast-enhanced breast MRI
DCIS	Ductal carcinoma in situ
DL	Ductal lavage
FNAC	Fine needle aspiration cytology
FSH	Follicle-stimulating hormone
^{18}F-FDG	^{18}F-Flurodeoxyglucose
GLUT	Glucose transporter proteins
GnRH	Gonadotropin releasing hormone
Hpl	Human placental lactogen
LH	Luteinizing hormone
LCIS	Lobular carcinoma in situ
MDE	Mammary duct ectasia
MRI	Magnetic Resonance Imaging
MLO	Mediolateral oblique
NAF	Nipple aspirate fluid
PET	Positron Emission Tomography
PIF	prolactin-inhibiting factor
US	Ultrasound
VAB	vacuum-assisted breast biopsy
^{99m}Tc	Technetium-99m

TRH	Thyrotropin releasing hormone

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Introduction

Mammary duct ectasia (MDE) is a benign breast disease that can mimic invasive carcinoma clinically. The process that causes the condition is still being debated but histologically it is characterized by dilation of major ducts in the subareolar region. The ducts contain eosinophilic granular secretions and foamy histiocytes. The secretions may undergo calcification and this may be the presenting sign ***(Guray, ٢٠٠٦).***

Duct ectasia / periductal mastitis is a benign disease complex of uncertain etiology. As it is more common in females, pregnancy and lactation were incriminated as a cause of the disease, but the condition was reported in virgins and males. Some authors believe it is an involutional change of the breast ductal system due to the aging process. One to two thirds of patients are smokers. Cigarette smoke may damage the ductal epithelium by its direct toxic effect or indirectly by influencing the blood flow and hormonal action on the duct epithelium. The uncertainty of this disease entity is extended to its pathogenesis, the earlier investigators believed that duct dilatation preceded the accumulation of thick fluid in the ducts as a result of hormonal change and excessive desquamation of ductal epithelium. These changes are subsequently followed by periductal inflammation when ductal contents leak throw the

wall of thin and damaged ducts. The concept of duct ectasia/ periductal mastitis was challenged by some authors who stated that the pathological process started as periductal mastitis with subsequent ductal dilatation secondary to destruction of the elastic lamina supports the ducts. Recently some authors made a different challenge to the pathogenesis of this condition, they stated that duct ectasia and periductal mastitis were not strictly linked pathological processes ***(Al-Masad, ٢٠٠١).***

Mammary duct ectasia, also called periductal mastitis is a distinctive clinical entity that can mimic invasive carcinoma clinically. It is a disease of primarily middle-aged to elderly parous women, who usually present with nipple discharge, a palpable subareolar mass, noncyclic mastalgia, or nipple inversion or retraction ***(Guray, ٢٠٠٦).***

The work-up of the woman presenting with nipple discharge typically begins with a thorough history and physical and directed breast imaging including diagnostic mammography and possibly diagnostic ultrasonography ***(Sabel et al., ٢٠١٢).***

The mammographic findings can be asymmetric or include calcification, which can simulate a carcinoma. Ultrasonography allows duct diameters greater than ٥ mm to be diagnosed and measured. It should be remembered that ultrasonography is an easily reproducible, noninvasive examination of low cost. Ductography and cytology of mammillary discharges offer a limited role as a diagnostic method for MDE ***(Rahal et al., ٢٠١١).***

The approach towards MDE is usually conservative. Surgery is reserved for case associated with suspected malignant abnormalities. One indication for surgery that has been little discussed in the literature relates to MDE that is associated with voluminous spontaneous papillary flow, which may cause these women social embarrassment ***(Rahal et al., ٢٠١١).***

Duct ectasia can sometimes result in infection if this happens, you may need to give antibiotics. In cases when the ducts will not return to normal size, they can be surgically removed, without causing a great change in breast appearance. This procedure called Hadfield's operation ***(Stephan, ٢٠٠٨).***

Despite the high frequency of MDE and the unresolved questions, there have been few studies on this condition over recent years. Studies investigating aspects of the physiopathology of MDE and the possibility of a relationship with cigarette smoking are needed, with identification of risk factors that are useful within clinical practice, thereby enabling prevention ***(Rahal et al., ٢٠١١).***

Aim of the Work

This work aims at:

١- Differentiating between benign and malignant causes of mammary duct ectasia and how to exclude malignancy.

٢- Better understanding of the management of mammary duct ectasia with inflammatory changes.

Anatomy of the Breast

Development:

At the fifth or sixth week of fetal development, two ventral bands of thickened ectoderm (mammary ridges, milk lines) are evident in the embryo. In most mammals, paired breasts develop along these ridges, which extend from the base of the forelimb (future axilla) to the region of the hind limb (inguinal area). These ridges are not prominent in the human embryo and disappear after a short time, except for small portions that may persist in the pectoral region. Failure of development of breasts called **(amastia)** or failure of development of nipples only called **(athelia).** Accessory breasts **(polymastia)** or accessory nipples **(polythelia)** may occur along the milk line when normal regression fails **fig (١)** ***(Bland et al., ٢٠١٠).***

Each breast develops when an ingrowth of ectoderm forms a primary tissue bud in the mesenchyme. The primary bud, in turn, initiates the development of ١٥ to ٢٠ secondary buds. Epithelial cords develop from the secondary buds and extend into the surrounding mesenchyme. Major (lactiferous) ducts develop, which open into a shallow mammary pit. During infancy, a proliferation of mesenchyme transforms the mammary pit into a nipple. If there is failure of a pit to elevate above skin level, an inverted nipple results. This congenital malformation occurs in ٤٪ of infants. At birth, the breasts are

identical in males and females, demonstrating only the presence of major ducts. Enlargement of the breast may be evident and a secretion, referred to as witch's milk, may be produced. These transitory events occur in response to maternal hormones that cross the placenta ***(Bland et al., ٢٠١٠).***

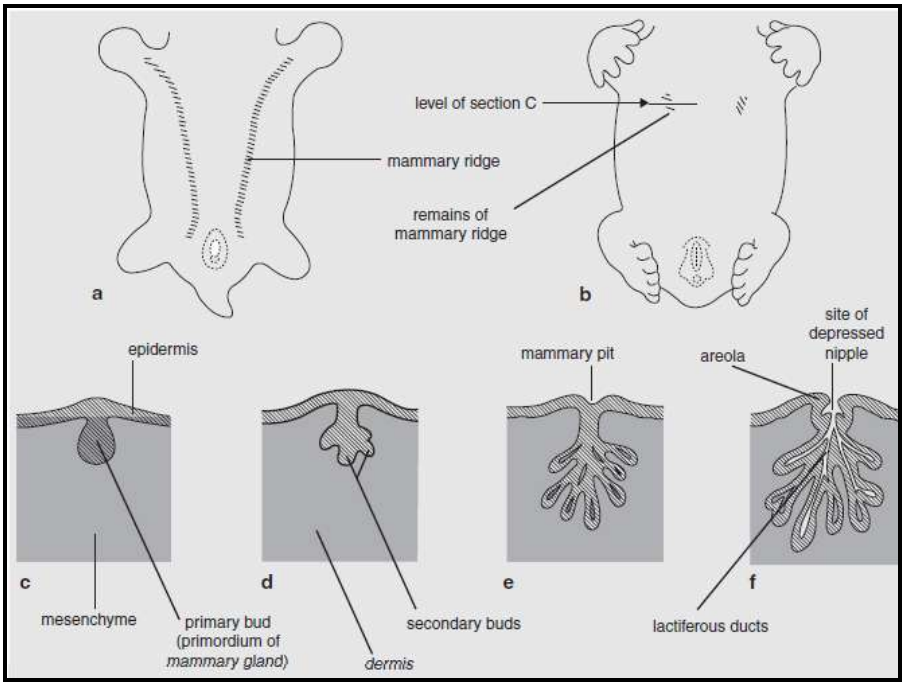

Figure (١): Embryonic development of the mammary glands. (a) Ventral view of a ٢٨-day embryo, with regression of the mammary ridge by ٦ weeks, as represented in (b) (c-f) Cross sections of the developing breast bud from ٦ weeks to birth ***(Shermak, ٢٠١٠).***

Gross anatomy:

- **Extent and location:**

The adult female breast lies between the second and sixth ribs and between the sternal edge and the midaxillary line. Breast tissue frequently extends into the axilla as the axillary