بسم الله الرحمن الرحيم

﴿قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ ﴾

صدق الله العظيم

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CURRENT TRENDS IN THE MANAGEMENT OF BREAST DUCTAL CARCINOMA IN SITU

An essay submitted for partial fulfillment of

Master Degree in surgical oncology

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- **مستخلص الرسالة:**

باللغة الاجنبية:

Ductal carcinoma in situ (DCIS) of the breast is a proliferation of epithelial malignant cells within the mammary ducts without invasion of the basement membrane. It is the most common form of non-invasive breast cancer. Multiple classification systems have been developed to standardize the diagnosis.

History and physical examination were the initial steps followed by mammography. Sonography is often used as second procedures but it is not sensitive. Positron Emission Tomography (PET) and PET/computed tomography scan are also not sensitive. Magnetic resonance imaging is more sensitive and becoming the standard modality .FNAC has little place in the diagnosis and core biopsy is better for accurate diagnosis.

Management remains controversial. No single approach is appropriate for all patients. Surgical treatment ranges from simple local excision to mastectomy **.**Axillary lymph node dissection is controversial. Now sentinel lymph node biopsy may be used. Role of radiotherapy is controversial given as adjuvant therapy to reduces recurrences, but not improve the survival rates. Tamoxifen used to decrease the recurrence rate**.** Recently the Aromatase Inhibitors may be used.

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Contents

Abbreviations

ACRIN	American College Of Radiologists Imaging Network.
AIS	Aromatase Inhibitors.
ALND	Axillary Lymph Node Dissection.
APBI	Accelerated Partial Breast Irradiation.
AT	Ataxia-Telangiectasia.
BCDDP	Breast Cancer Detection Demonstration Project.
BCS	Conservative Breast Surgery.
BCT	Breast Conservation Therapy.
BSE	Breast Self-Examination.
CBE	Clinical Breast Examination.
DCIS	Ductal Carcinoma In Situ.
DVAB	Directional Vacuum-Assisted Biopsy.
DVT	Deep Vein Thrombosis.
EORTC	European Organization For Research And Treatment Of Cancer.
ELIOT	Electron Intra Operative Therapy.
ER	Estrogen Receptor.
FFTP	First-Full-Term Pregnancy.
FUS	Focused US.
HG	High Nuclear Grade.
HR+	Hormone Receptor Positive.
ILA	Interstitial Laser Ablation.
ILC	Invasive Lobular Carcinoma.
LCIS	Lobular Carcinoma In Situ.
MC	Medullary Carcinoma.
mCi	MilliCurie.
NCCN	National Comprehensive Cancer Network.
NHSBSP	National Health Service Breast Screening Programme
NOS	Not Otherwise Specified.
PET	Positron Emission Tomography.

PR	Progesterone Receptor.
RFA	Radiofrequency Ablation.
RT	Radiation Therapy.
SLNB	Sentinel Lymph Node Biopsy.
SN	Sentinel Lymph Node.
TAM	Tamoxifen.
TDLU	Terminal Duct Lobular Unit.
UK/ANZ	United Kingdom/Australia New Zealand.
USC/ VNPI	University of Southern California/ Van Nuys Prognostic Index.
VNPI	Van Nuys Prognostic Index.
WBI	Whole Breast Irradiation.

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Key word:

Cancer breast

Early breast cancer

Stage Tis

Non invasive breast cancer

Ductal carcinoma in situ (DCIS)

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Introduction:

Ductal carcinoma in situ (DCIS) of the breast is a proliferation of epithelial malignant cells confined within the lumen of mammary ducts without evidence of stromal invasion through the basement membrane into adjacent breast stroma by light microscopic examination **(Tsikitis & Chung, 2006).**

Ductal carcinoma in situ is the most common form of non-invasive breast cancer constitutes about 85%-90% of non-invasive breast cancer with survival rate close to 100% **.**Multiple classification systems have been developed to standardize the histopathological diagnosis of DCIS, including the scheme introduced by Holland et al and Van Nuys classification **(Silverstein et al., 1995).**

History and physical examination were the initial steps in the evaluation of DCIS. Patients with DCIS present with a palpable mass, nipple discharge or Paget's disease of the nipple. Occasionally, DCIS was an incidental finding in an otherwise benign biopsy specimen **(Adlard et al., 2006)**

Today ductal carcinoma in situ (DCIS) is commonly diagnosed, mainly due to widespread use of screening mammography. Sonography is often used as second procedures for detecting breast cancer but it is not sensitive for detection DCIS. Positron Emission Tomography (PET) and PET/computed tomography scan are also not sensitive. Magnetic resonance imaging is more sensitive and becoming the standard modality for diagnosis **(Tsikitis & Chung, 2006).**

Since most cases of DCIS are non-palpable and mammographically detected lesions, image-directed procedures are necessary to confirm the diagnosis. FNAC has little place in the diagnosis of DCIS. Because of its lack of histology, alone FNAC is incapable of distinguishing between in situ and invasive disease.

On the other hand, core biopsy yields a larger tissue sample and therefore it is a valuable diagnostic method to achieve accurate preoperative tissue diagnosis as stereotactic core needle biopsy. Wire-guided open biopsy also used in diagnosis. The stereotactic-guided directional vacuum-assisted biopsy (DVAB) has been introduced in clinical practice and improves diagnostic accuracy in the preoperative evaluation of patients with DCIS **(Meijnen et al., 2007).**

Because of heterogeneity of DCIS, its management remains controversial. Moreover, each patient's particular needs and preferences should be taken into consideration during the process of therapeutic decision-making. As a result, no single approach is appropriate for all patients and management should be individualized. Surgical treatment ranges from simple local excision to various forms of wider excision: segmental resection, quadrantectomy, and mastectomy **(George et al., 2007).**

The role of minimally invasive methods (such as the therapeutic application of the DVAB technique, radiofrequency ablation, laser therapy, cryotherapy and brachytherapy) in the management of small DCIS remains unproven **(Noguchi et al., 2006).**

Axillary lymph node dissection is controversial in the treatment of DCIS. Theoretically pure DCIS is a localized disease confined within the basal membrane, without any risk of invasion of lymph nodes or vessels, as a result, axillary dissection is not indicated, but extensive DCIS can contain small foci of invasive disease, accounting for the finding of positive axillary nodes in 1–2% of patients and therefore need dissection. Now alternative minimally invasive procedures as sentinel lymph node biopsy may be used **(Kefah & Bruno, 2006).**

Role of radiotherapy is controversial given as adjuvant therapy after breast-conserving surgery reduces in situ and invasive recurrences by about half, but has not been shown to produce improvement in the already excellent survival rates. Some authors believe it should be standard treatment for all women, whereas others have reserved for those considered to be at highest risk due to adverse prognostic factors, while mastectomy provides optimal local control **(Adlard et al., 2006).**

Tamoxifen used in the management of selected patients with DCIS, and provide a decrease in the rate of invasive cancer; especially in the ipsilateral breast, that reduction was also seen in the rate of invasive and noninvasive tumors in the contralateral breast and at regional or distant sites. Recently the aromatase inhibitors may be used in the management of DCIS **(George et al., 2007).**

Aim of the work:

Aim of this study is to discuss the current trends in management of ductal carcinoma in situ as regards its incidence, diagnosis, treatment and survival.

Anatomy of the Breast

Normal development:

In the young embryo a linear thickening of ectoderm appears called the milk ridge, which extends from the axilla obliquely to the inguinal region **fig (1).** In animals, several mammary glands are formed along this ridge. In the human, the ridge disappears except for a small part in the pectoral region. This localized area thickens, becomes slightly depressed, and sends off 15 to 20 solid cords, which grow into the underlying mesenchyme. Meanwhile, the underlying mesenchyme proliferates and the depressed ectodermal thickening becomes used to form the nipple. At the 5th month, the areola is recognized as a circular pigmented area of skin around the future nipple **(Snell, 2004).**

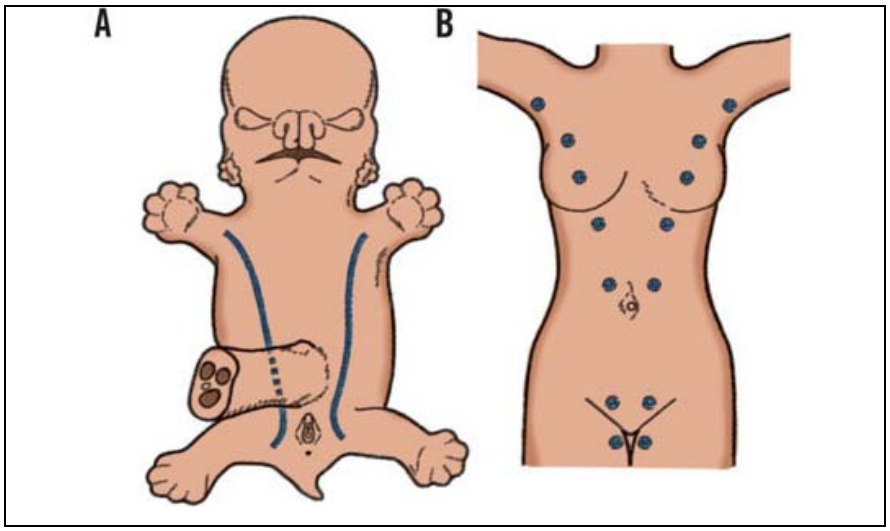

Fig (1): **A.** The milk lines in a generalized mammalian embryo. Mammary glands form along these lines. **B.** Common sites of formation of supernumerary nipples or mammary glands along the course of the milk lines in the human **(Skandalakis et al., 2006).**

Gross anatomy:

Each breast (right or left) is a rounded elevation present on the front of the upper part of the thorax over the pectoral region. Over the centre of the breast the skin shows a dark circular area which is called the areola. In the centre of the areola there is a conical projection called the nipple **(Singh, 2002).**

The adult female breast is located within the superficial fascia of the anterior chest wall. The base of the breast extends from the second rib above to the sixth or