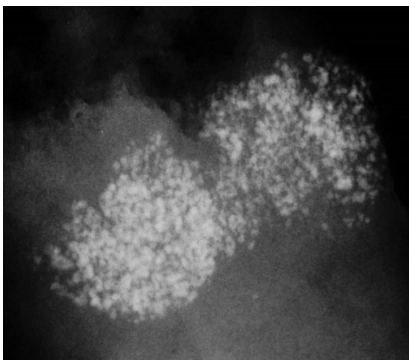


3D image of sclerosing adenosis



Mammogram of sclerosing adenosis



*School of Radiology*

**2023**

**SUMMER SCHOOL  
BREAST IMAGING  
with  
LÁSZLÓ TABÁR**

**A WEBINAR-BASED, INTERACTIVE,  
UNIQUE LEARNING EXPERIENCE**

*July 17th, 19th and 21st, 2023*

Organized by  
Professor Pascal Baltzer  
*and*  
Professor Matthias Dietzel

*Designed for:*

**Radiologists • Surgeons • Pathologists  
Gynecologists • Radiology Technologists**

*This course provides extensive knowledge about diagnostic breast imaging, differential diagnosis of breast diseases, implications for management*

**2023**  
SUMMER SCHOOL  
BREAST IMAGING

Detection and Diagnosis of Breast Diseases  
Using the Multimodality Approach. An interactive course.

## FACULTY and COURSE ORGANIZERS



**Prof. Dr. Matthias Dietzel, MD, MHBA and Prof. Dr. Pascal Baltzer, MD**  
Directors, School of Radiology



**László Tabár, MD, FACR (Hon).**  
Uppsala University, Sweden  
Speaker

# SCHOOL OF RADIOLOGY

## SUMMER COURSE DESIGN

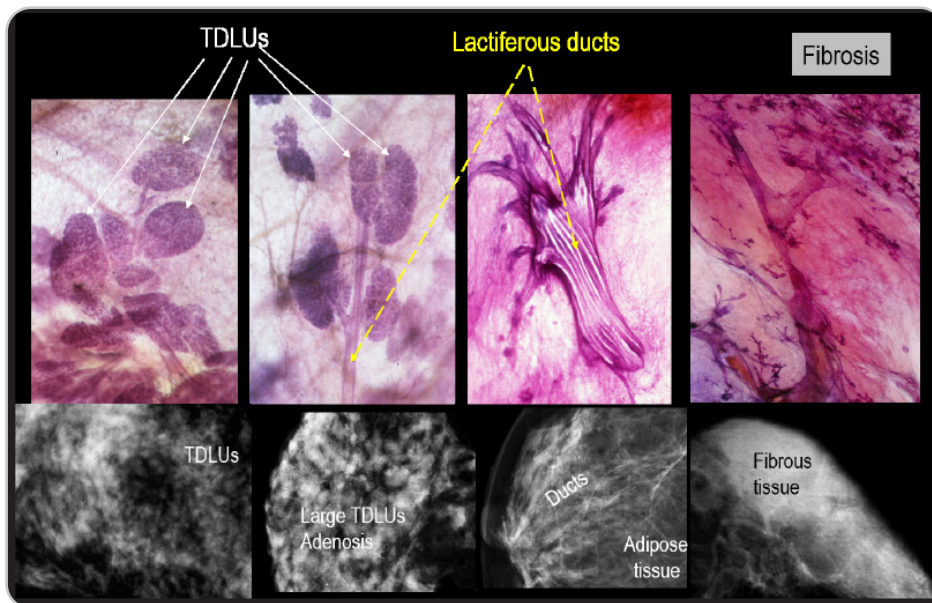
- \* The lectures on each major subject will be mixed with **interactive sessions** consisting of questions relevant to the subject and also a mixture of normal and early cancer cases presented as they appear on a viewing station. Using interactive online polls, your personal learning progress will be shown. This course design gives immediate feedback demonstrating the effectiveness of our teaching methods.
- \* During the course you will progressively **improve your skills in reading and interpreting breast images**. You will learn the full spectrum of normal breast images, with all important findings explained with the help of 3-dimensional histology images.
- \* Our course aims at helping you to reduce **unnecessary call-backs** and **increase your confidence** in reading mammograms.
- \* You will receive **immediate feedback** and histologic confirmation using large format histology.
- \* The multimodality approach will be emphasized throughout the course.
- \* Special emphasis will be placed on **finding early phase breast cancers**.



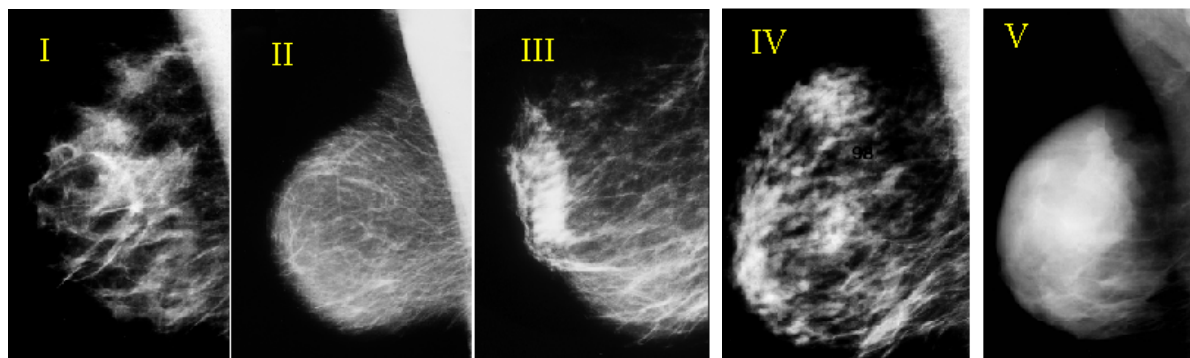
**Day 1** Interactive workshop between 6:30 PM and 9:00 PM. **Break: 8:00 PM**

**6:30 PM** INTRODUCTION FOLLOWED BY DIDACTIC LECTURES COVERING:

- A NEW ERA in the DIAGNOSIS and TREATMENT of BREAST CANCER. A SHORT HISTORY.
- Correlating 3-dimensional, subgross anatomy with mammography of the normal breast results in **increased confidence in reading a mammogram** and **finding small abnormalities**. Special training in large format thin and thick section (3D) histopathologic correlation enables the radiologist to account for every linear and nodular density on the mammogram.



The breast, unlike any other organ, has **five structurally different mammographic parenchymal patterns**.



8:00 PM - 8:15 PM **B r e a k**



**Day 1** Interactive workshop between 6:30 PM and 9:00 PM. **Break: 8:00 PM**

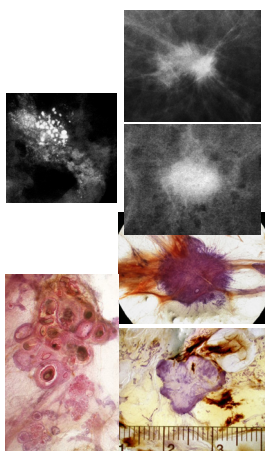
- **The technique of reading mammograms** and the basis for skillful and efficient interpretation of the mammographic image.

**HOW TO FIND THE INVASIVE BREAST CANCER WHEN IT IS STILL SMALL.** *Malignant stellate and circular/oval-shaped lesions originating from the TDLUs (AAB):* clinical presentation, histology, mammographic - MRI - ultrasound appearance and outcome.

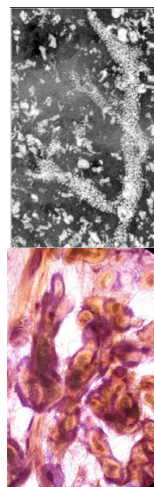
- **A systematic method for viewing mammograms.** Areas on the mammogram where most breast cancers will be found. Viewing dense breasts. Viewing relatively easy-to-read breasts.
- The role of hand-held ultrasound / 3D automated ultrasound / MRI in the detection and workup of the findings. **The multimodality approach.**

- **Algorithm for classifying breast diseases according to their site of origin.**

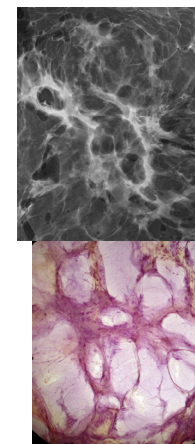
- **Interactive session:** Using what has just been taught, each participant will assess a *mixture of normal and early cancer cases*, and vote anonymously using a smartphone or tablet. The combined results will appear instantly for discussion. and evaluation.
- \* **All abnormal cases are fully worked up and the complete imaging workup will be presented in detail, including ultrasound, MRI and large section histopathology.**



Acinar adenocarcinoma of the breast (AAB), breast cancer of acinar origin



Ductal adenocarcinoma of the breast (DAB), breast cancer originating in the major lactiferous duct(s)



Breast cancer of mesenchymal origin (BCMO)

9:00 PM. End of Day 1.

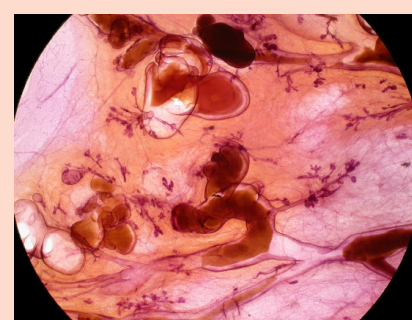
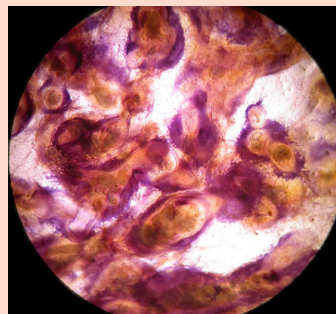
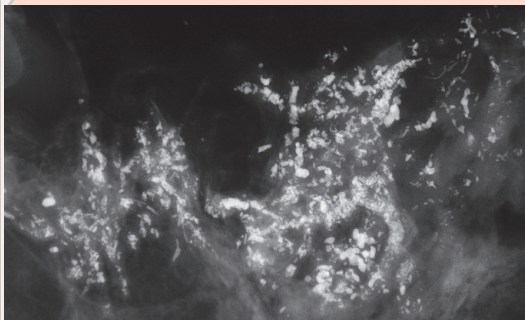
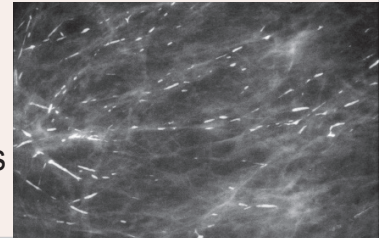
**Day 2** Interactive workshop between 6:30 PM and 9:00 PM. **Break: 8:00 PM**

CALCIFICATION ANALYSIS ON THE MAMMOGRAM

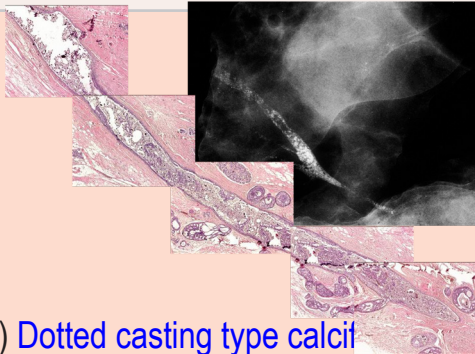
ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

Breast diseases originating in the major ducts

- **Benign type calcifications** originating in the major ducts
  - a) Secretory disease type calcifications
- **Malignant type calcifications** originating in the major ducts
- **Interactive calcification analysis.**



a) **Fragmented casting type calcifications.**



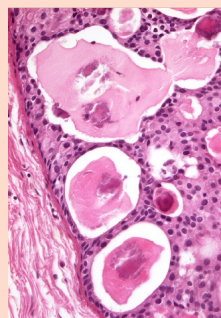
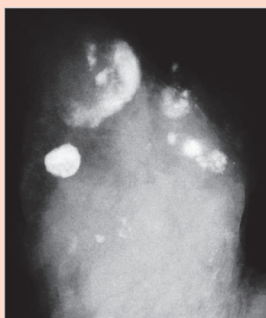
b) **Dotted casting type calcif**

\* **Four different malignant type calcifications** developing in the major ducts: a) fragmented casting type b) dotted casting type c) skipping stone-like d) pearl necklace-like.

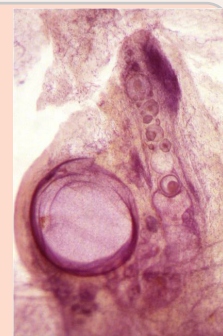
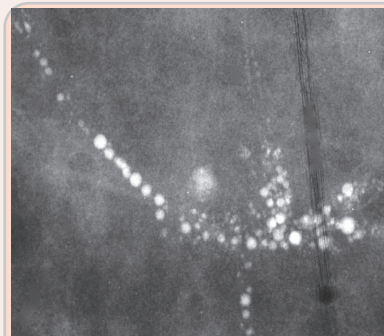
\* The concept of **neoductgenesis**. Long-term follow-up results. New aspects, correct terminology.

\* The role of breast MRI examination in demonstrating the extent of Gr 3 in situ carcinoma.

\* Mammographic/3D histologic correlation helping to explain the underlying pathophysiology and outcome.



c) **Skipping stone-like calcifications**



d) **Pearl necklace-like calcifica-**

8:00 PM - 8:15 PM **Break**



Day 2 Interactive workshop between 6:30 PM and 9:00 PM. Break: 8:00 PM

**MALIGNANT:**  
*lecrosis, no fluid*

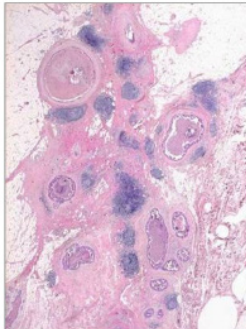

**Ca++ in necrosis**

**Ductal Origin**  
*Ca++ on the mammogram*

**Type 1**  
**"FRAGMENTED CASTING"**  
*(solid bars)*

*Diffuse, lobar disease*

*Grade III solid cell proliferation*

Fragmented casting

**MALIGNANT:**  
*Necrosis, no fluid*

**Ca++ in necrosis**

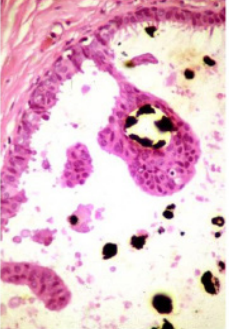
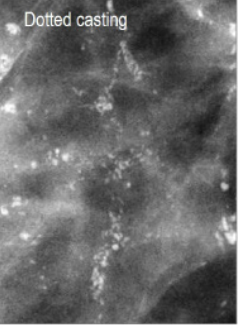
**Ductal Origin**  
*Ca++ on the mammogram*

**Type 2**  
**"DOTTED CASTING-TYPE"**  
*(snakeskin-like)*

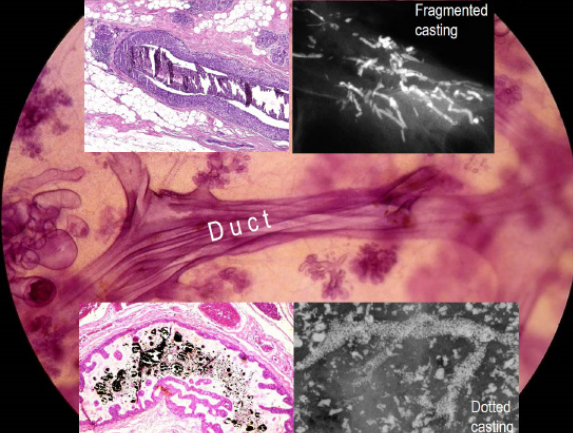
*-Diffuse, lobar disease*

*-Grade III*

*-micropapillary cell proliferation*

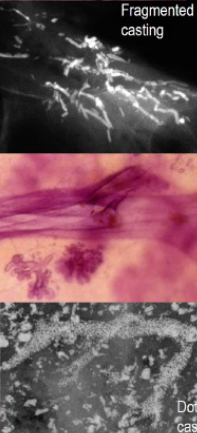



Dotted casting

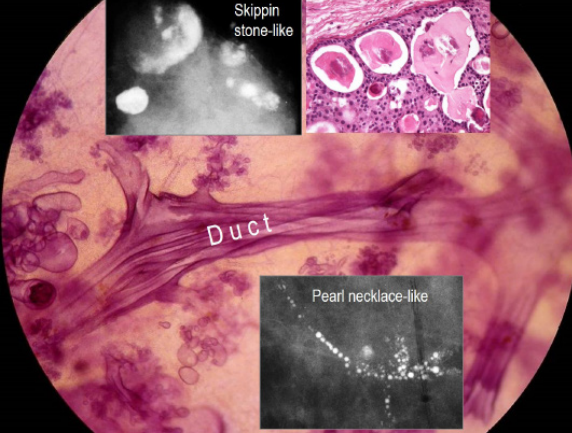


Fragmented casting

Duct

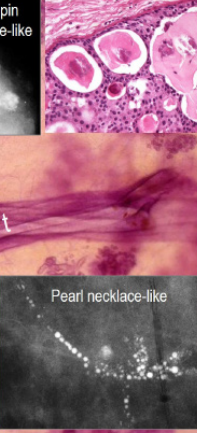


Dotted casting



Skippin stone-like

Duct



Pearl necklace-like

Interactive calcification analysis.

**MALIGNANT:**  
*No necrosis, fluid*

**Ca++ in proteinaceous fluid**

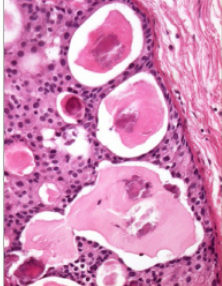
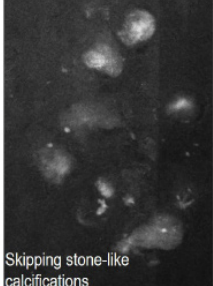
**Ductal Origin**  
*Ca++ on the mammogram*

**Type 3**  
**"DISCOID"**  
*(skipping stone-like)*

*-Diffuse lobar disease*

*-Grade II*

*-Micropapillary or/and cribriform*

Skipping stone-like calcifications

**MALIGNANT:**  
*No necrosis, fluid*

**Ca++ in proteinaceous fluid**


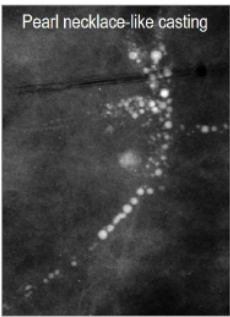
**Ductal Origin**  
*Ca++ on the mammogram*

**Type 4**  
**"PEARL NECKLACE"**

*-large psammoma body-like calcifications within ducts*

*-Grade I or/and 2*

*- Micropapillary, cribriform.*

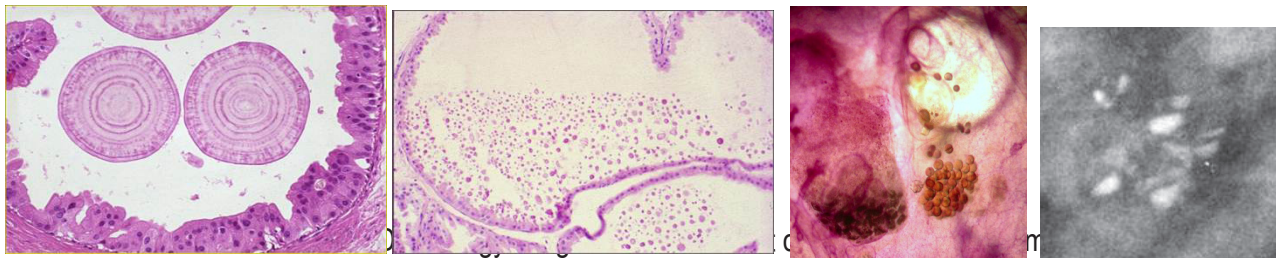



Pearl necklace-like casting

**Day 3** Interactive workshop between 6:30 PM and 9:00 PM. **Break: 8:00 PM**

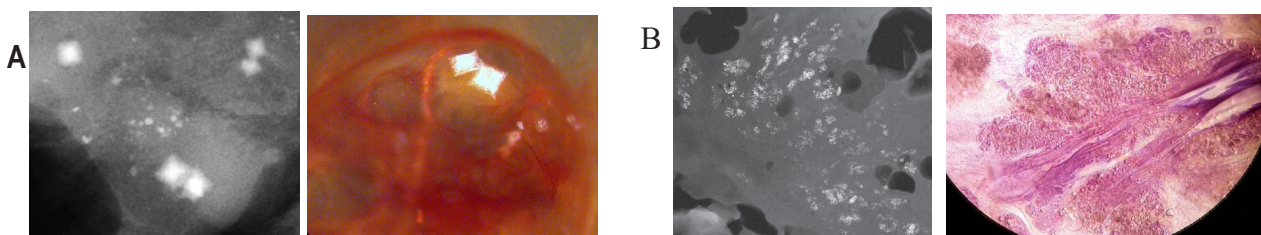
ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

- **Benign breast diseases originating in the TDLU** and associated with calcifications on the mammogram
  - **Fibrocystic change. Fibroadenoma. Different types of adenosis.** Understanding pathophysiology leading to calcified and non-calcified hyperplastic breast changes.

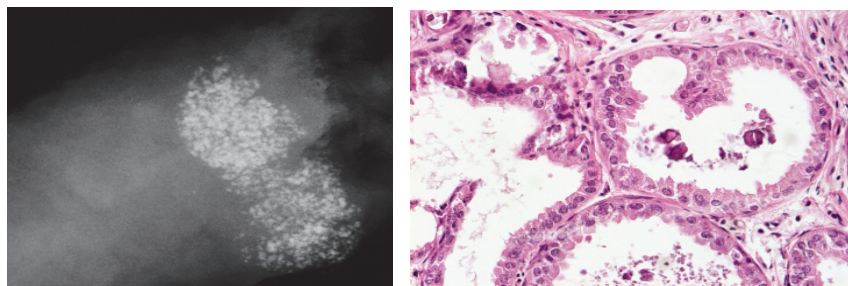


body-like calcifications, seen as "teacup-like calcifications on the mammogram.

- Detailed analysis of calcifications associated with hyperplastic breast changes: Weddellites (A), powdery calcifications (B), cluster skipping stone-like calcifications on the mammogram.



- The morphologic analysis of calcifications representing a less aggressive carcinoma:  
**Grade 1 / well differentiated CIS**

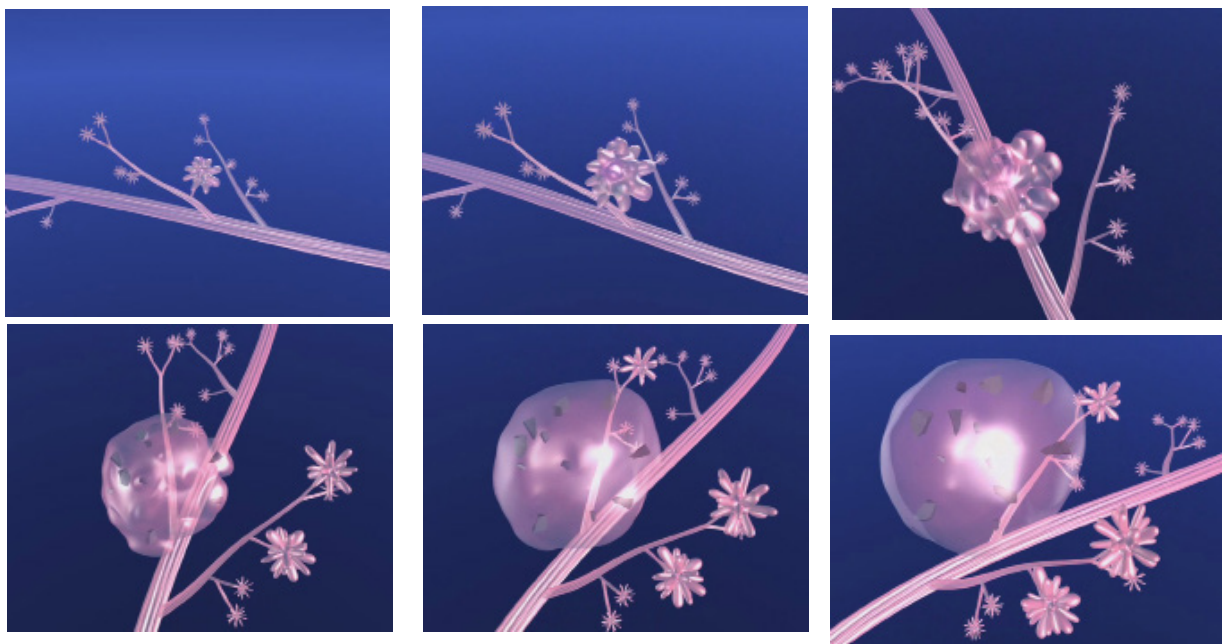
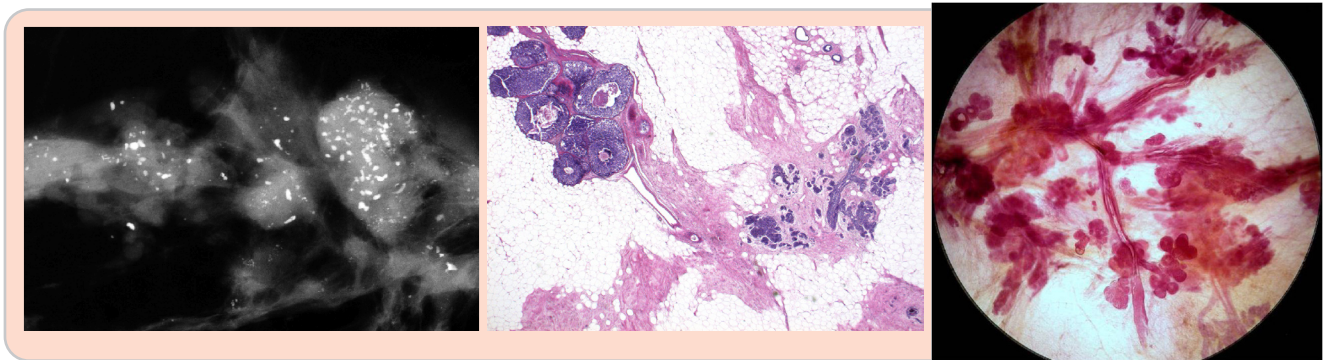
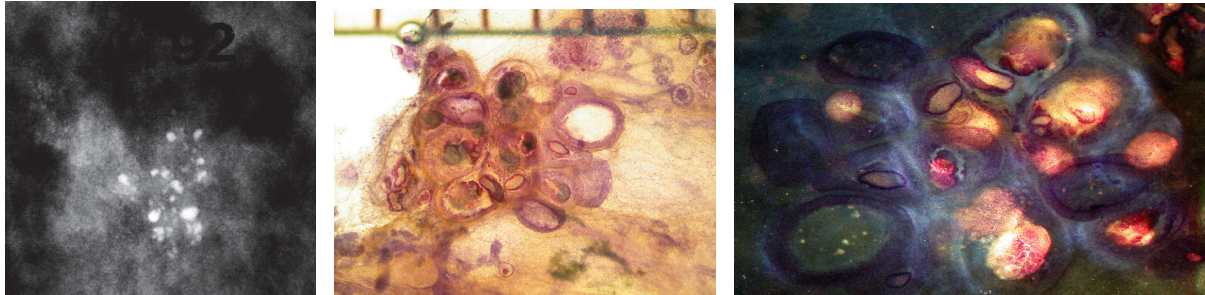


Grade 1 *in situ* carcinoma:  
Mammographic / 3D histologic / MRI correlation  
of cases with powdery calcifications on the mammogram.



**Day 3** Interactive workshop between 6:30 PM and 9:00 PM. **Break: 8:00 PM**

Mammographic/ histopathologic correlation of pleomorphic calcifications representing Gr 2 CIS within the TDLU



Computer simulation images of the development of Grade 2 *in situ* carcinoma within the TDLU. The lobule becomes gradually distended and deformed. Calcifications are formed within the necrotic debris and are seen on the mammogram as **crushed stone-like calcifications**.

9:00 End of the course

**2023**  
SUMMER SCHOOL  
BREAST IMAGING

Detection and Diagnosis of Breast Diseases  
Using the Multimodality Approach. An interactive course.

## Registration & Program Details

<https://school-of-radiology.com/summerschool-2023/>

### FAQ

<https://school-of-radiology.com/faq>

email: [office@school-of-radiology.com](mailto:office@school-of-radiology.com)

phone/SMS/WA: [+49 157 58741925](tel:+9115758741925)

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A photograph from the collection of the non-profit Tabar Foundation dedicated to Research and Education for Breast Cancer



2023

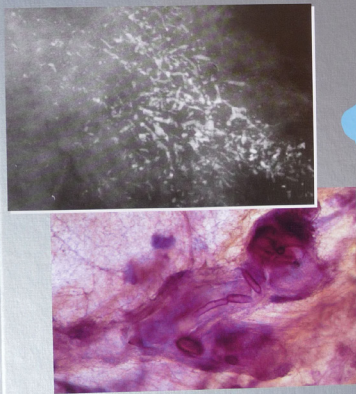
BREAST SYMPOSIUM SERIES of  
European Journal of Radiology

Detection and Diagnosis of Breast Diseases  
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## Breast Cancer Early Detection with Mammography

Casting Type Calcifications: Sign of  
a Subtype with Deceptive Features

László Tabár  
Tibor Tot  
Peter B. Dean

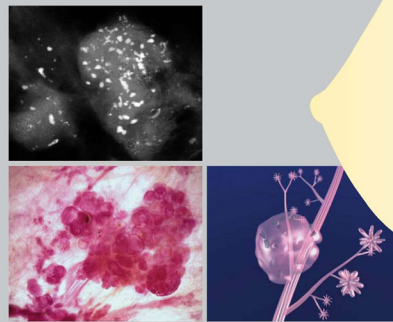


Thieme

## Breast Cancer Early Detection with Mammography

Crushed Stone-like Calcifications:  
The Most Frequent Malignant Type

László Tabár  
Tibor Tot  
Peter B. Dean



Thieme

[www.thieme.com](http://www.thieme.com)

## Breast Cancer The Art and Science of Early Detection with Mammography

László Tabár  
Tibor Tot  
Peter B. Dean



Immunohistochemistry,  
Molecular Biology,  
and Pathologic Correlation

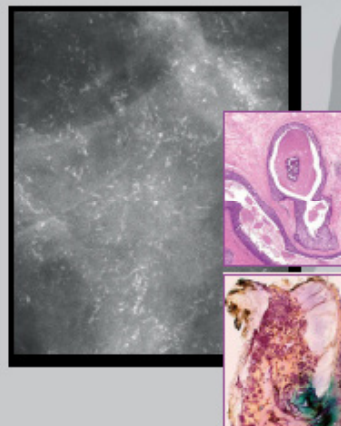
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## Teaching Atlas of Mammography

László Tabár  
Peter B. Dean

With the contribution of Tibor Tot

4th edition



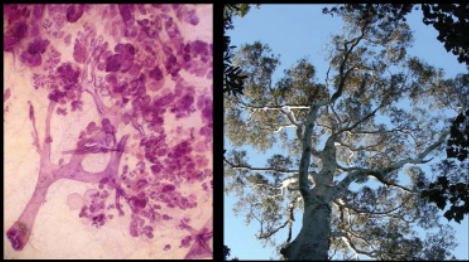
Thieme

2023

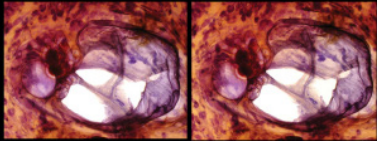
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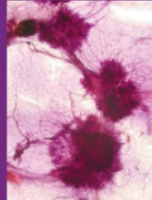
*László Tabár, MD*  
*Tibor Tot, MD, Peter B. Dean, MD*



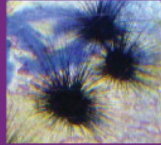
**Understanding the Breast  
in Health and Disease**



**In 3D**

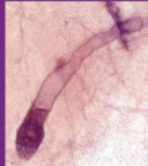


Multifocal breast cancer




Sea urchins

**In 3D**



*In situ* ductal carcinoma

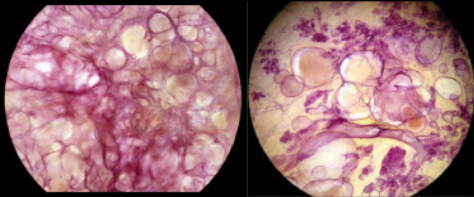


Banana flower

The basic structural elements of the female breasts are illustrated here in true 3-dimensional (3D) images and described in this Volume I by three breast cancer experts with decades of experience in the diagnosis of breast diseases. These images provide the best way to understand the great variability of the normal breast structure and the changes brought about by benign and malignant diseases.

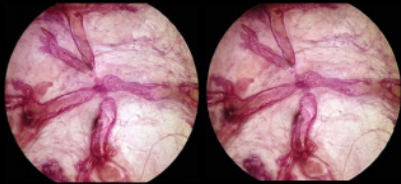
[www.mammographyed.com](http://www.mammographyed.com)

*László Tabár, MD,*  
*Tibor Tot, MD, Peter B. Dean, MD,*  
*Miklós Tarján, MD*



cysts in a prostate      breast cysts

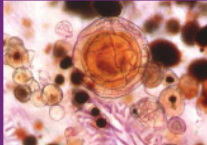
**Prostate and Breast:  
Brother and Sister Organs**



**In 3D**



Prostate calcifications



Laminated calcifications  
in the prostate

Printed in China  
ISBN 978-0-9883361-2-9  
50100  
9 788336129

**In 3D**



Laminated calcifications in  
the breast



Rowan berries

Even as the risk of getting prostate and breast cancer is rising, early detection through screening and treatment in an early stage are significantly lowering the risk of dying from these diseases. This series of 3D books aims to empower both men and women with knowledge about their health. Although all of us are at risk of developing cancer or less serious problems in one or the other of these two organs, education will help us seek the benefits provided by modern health care and expect excellence from health care providers.

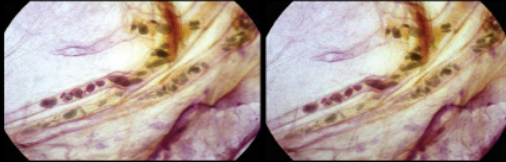


2023

BREAST SYMPOSIUM SERIES of  
European Journal of Radiology

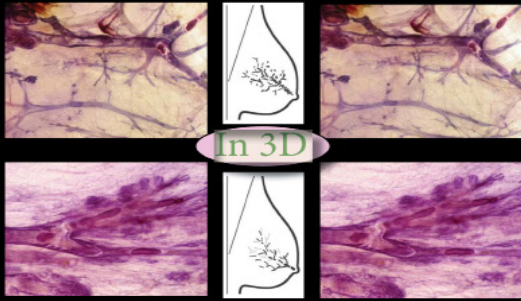
Detection and Diagnosis of Breast Diseases  
Using the Multimodality Approach. An interactive course.

László Tabár, MD  
Tibor Tot, MD, Peter B. Dean, MD



Breast cancer of ductal origin with microcalcifications

## Ductal Adenocarcinoma of the Breast (DAB), Part 1



In 3D



8 mm poorly differentiated invasive breast cancer associated with neoductogenesis (DAB)

A photograph reminiscent of neoductogenesis with associated tiny invasive tumors

Printed in China  
ISBN 978-0-9883611-3-6  
9 780988 336136



Fragmented casting type calcifications make the cancerous duct-like structures visible on the mammogram.

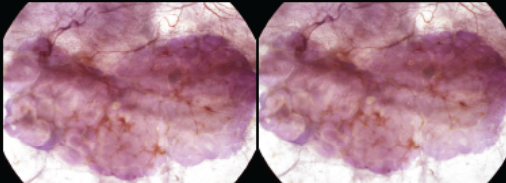


Neoductogenesis is a frequent phenomenon in the plant world

The mammogram is a true representation of the structural changes induced by the genetic constellation of each breast cancer subtype. The mammographic/MRI/ultrasound presentation of a particular subtype reflects the nature and extent of the underlying disease process, and when correctly interpreted, can guide patient management and help in predicting the long-term outcome. This information is available at the moment of diagnosis, without the additional expense and time necessary for molecular and immunohistochemical analysis.

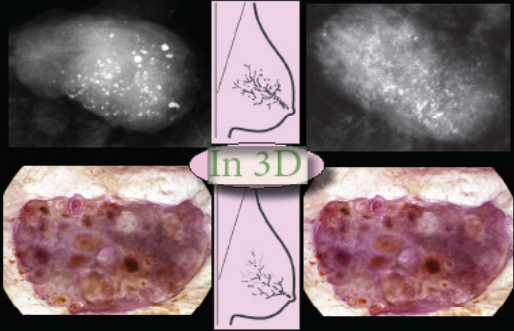
In 3D

László Tabár, MD  
Tibor Tot, MD, Peter B. Dean, MD

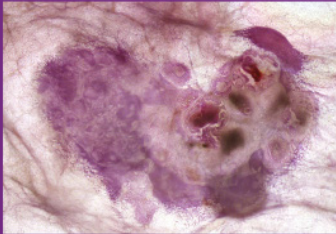


An axillary lymph node populated with metastases mimicking *in situ* cancer

## Ductal Adenocarcinoma of the Breast (DAB), Part 2

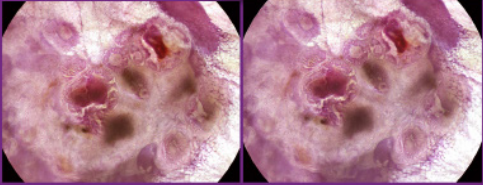


In 3D



Metastases within an axillary lymph node mimicking cancer *in situ*

In 3D



Stereoscopic image pair of the DAB with calcifications within a lymph node

Breast cancers originating from the major milk ducts (breast cancer of ductal origin, DAB) occasionally cause axillary lymph node metastases which are similar in appearance at histology to DAB in the breast. Regardless of whether or not the myoepithelial cell layer is demonstrable, the decisive question is how do the duct-like structures grow inside the lymph nodes? Although the histopathologic appearance will be termed by pathologists as invasive cancer, i.e., when found in the prostate or in the axillary lymph node(s), a similar histopathologic appearance is termed "DCIS" when found in the breast. In reality, we face "duct forming invasive cancer" with poor outcome (neoductogenesis) in the breast, in the prostate and in the axillary nodes.



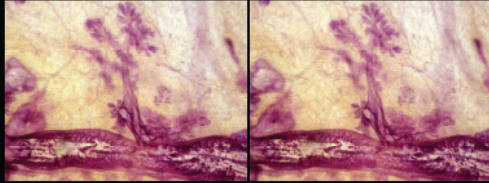
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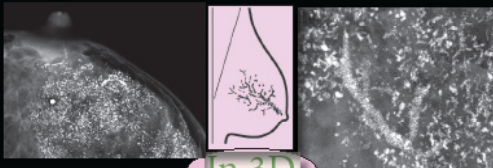
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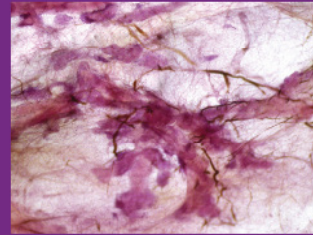
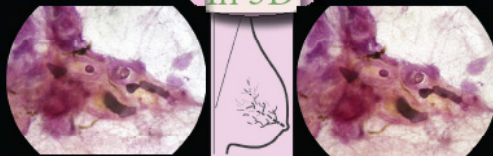


Micropapillary breast cancer of ductal origin associated with a normal TDLU

### Ductal Adenocarcinoma of the Breast (DAB), Part 3

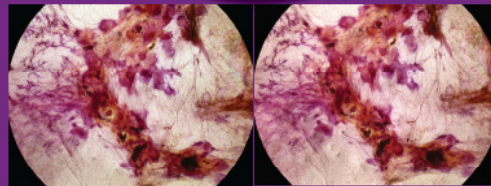


In 3D



Neoductogenesis (DAB)  
associated with angioneogenesis

In 3D

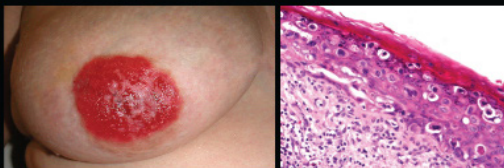


Normal atrophic ducts and cancerous, distended ducts side by side

Breast cancers that originate in the major milk ducts (ductal adenocarcinoma of the breast, DAB) are diffuse and often extensive. The disease may occupy an entire lobe from the nipple to the chest wall, and frequently extends close to the skin. For these reasons, breast conserving surgery and skin or nipple sparing mastectomy of DAB cases carry a higher risk of local/regional/distant recurrence. In addition: 1) a considerable portion of the disease may lack calcifications, often occult for the imaging methods. 2) This subtype of breast cancer is less responsive to postoperative radiotherapy.

László Tabár, MD

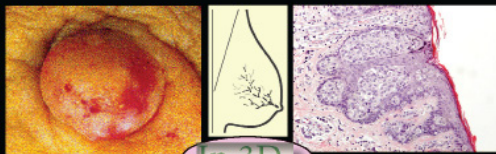
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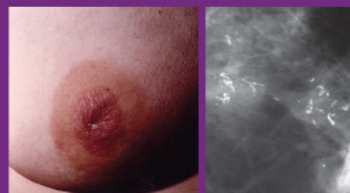
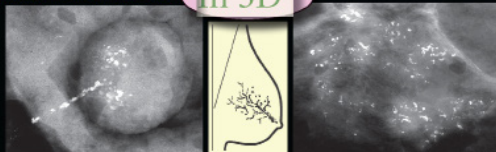
Paget's disease of the nipple

Paget's cells in the epidermis of the nipple

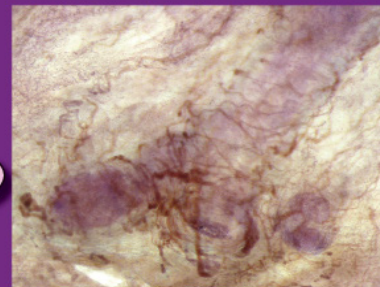
### Ductal Adenocarcinoma of the Breast (DAB), Part 4



In 3D



Paget's disease of the nipple and breast cancer of ductal origin



Cancer-filled duct in Paget's disease with angioneogenesis

In 3D

One of the features which is unique to breast cancers originating from the major ducts (DAB) is **Paget's disease of the breast**. It was first described by the British pathologist, James Paget in 1874. He described 14 cases of breast cancer associated with an eczema-like skin change of the nipple and areola. Almost 1% of all breast cancers present with Paget's disease of the nipple, and the diagnosis is confirmed by histologically demonstrating the Paget cells of the affected epidermis. The underlying breast cancer can be best demonstrated by combining all breast imaging methods. Of these, breast MRI is the most sensitive, showing the presence and true extent of the underlying DAB, often before calcifications can be detected on the mammogram.



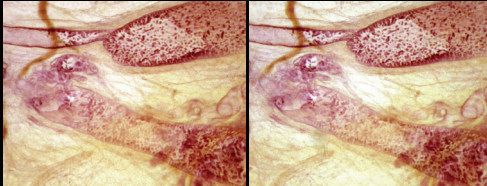
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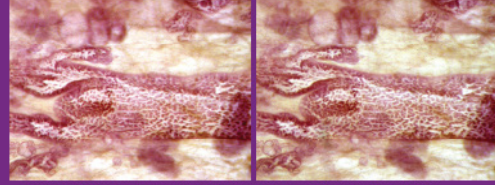
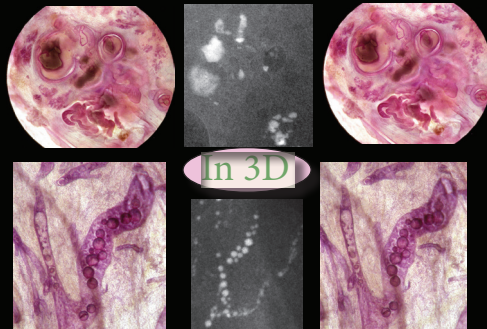
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### Ductal Adenocarcinoma of the Breast (DAB), Part 5

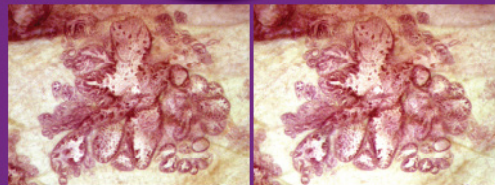
Fluid producing DAB subtypes associated with calcifications



Fluid producing micropapillary breast cancer of ductal origin (DAB)



In 3D



Neoductgenesis in micropapillary breast cancer of ductal origin (DAB)

This volume describes the subtypes of breast cancers that arise in the major ducts, produce a viscous, proteinaceous fluid. Little or no necrosis is present. The calcifications formed within the fluid have characteristic, but deceptively benign appearance, although the malignancy may extend throughout an entire lobe. This book will help identify these deceptive cases through correlating the mammographic/ultrasound/MRI presentation with large / thick section (3D) histology.

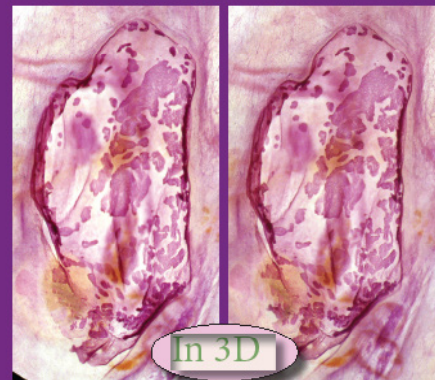
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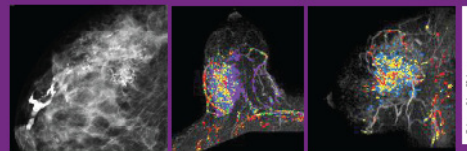


Bloody and serous nipple discharge

### Ductal Adenocarcinoma of the Breast (DAB), Part 6



Fluid producing micropapillary breast cancer of ductal origin (DAB)



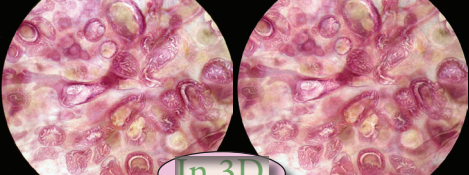
Spontaneous unilateral serous or bloody nipple discharge can be an alarming clinical symptom for the patient and also, it may cause considerable differential diagnostic problem for the radiologist. This volume of our 3D book series correlates the imaging findings (mammography / breast ultrasound / breast MRI) with large thin- and large thick section (subgross, 3D) histology in cases when the underlying cause of the discharge is fluid-producing breast cancer originating from the major ducts (DAB).

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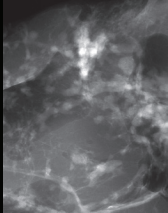
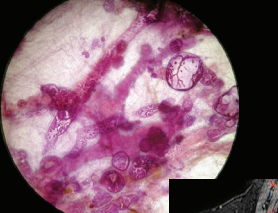


**In 3D**

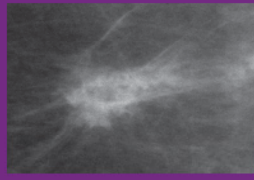
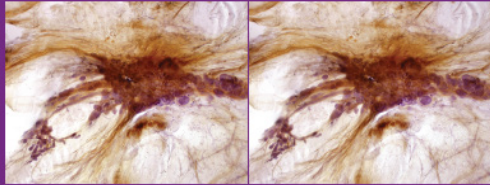
Breast cancer originating from the major ducts

### Ductal Adenocarcinoma of the Breast (DAB), Part 7

*Architectural distortion on the mammogram without calcifications or nipple discharge*

Mammographic-MRI-subgross (3D) histologic correlation of this extensive micropapillary cancer originating from the major ducts presenting as architectural distortion.

Architectural distortion on the mammogram without calcifications or nipple discharge

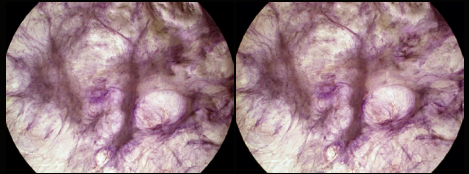
**In 3D**

Printed in China  
ISBN 978-0-9888561-9-8 \$51.00

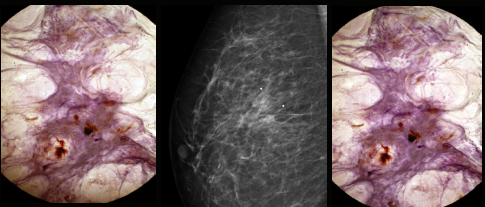
There are two main groups of diffuse breast cancers presenting on the mammogram as large regions of architectural distortion; these account for about 25% of all breast cancers and tend to have a poor outcome: 1) **Neoductogenesis**, i.e. "duct forming invasive carcinoma", the topic of this volume, often erroneously diagnosed as "DCIS", and 2) **Diffusely infiltrating breast cancer**, the topic of Vol. XI.

This volume demonstrates the DAB subgroup where the unnaturally high concentration of abnormal, tumor-filled ducts results in an asymmetric density with architectural distortion on the mammogram and often causes a palpable "thickening". Detecting architectural distortion on the mammogram and diagnosing the underlying disease correctly is a challenge for the radiologist. Breast cancers originating from the major ducts (DAB) are characterized by the formation of new, duct-like structures through the process of Neoductogenesis.

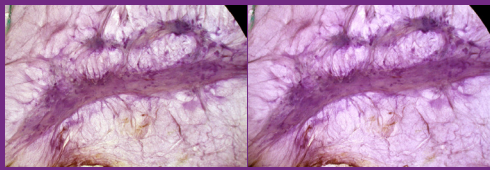
*László Tabár, MD*  
*Tibor Tot, MD, Peter B. Dean, MD*  
*Olga Puchkova, MD*



### Diffusely infiltrating breast cancer, Part 1



**In 3D**



Stereoscopic subgross (3D) image pair of a diffusely infiltrating breast cancer

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**In 3D**




Extensive diffusely infiltrating breast cancer: the dominant feature is the extreme amount of connective tissue with concave contours.

This volume describes a breast cancer subtype that is a substantial challenge for the entire breast cancer team. The clinical, imaging and outcome observations indicate that diffusely infiltrating breast cancer represents a very unusual breast malignancy, regardless of whether it is E-cadherin negative or positive. All aspects of the diffusely infiltrating breast cancer suggest that it may have a site of origin different from all other breast cancers. We propose that it originates from the mesenchymal stem cells/progenitors through a complex process of epithelial-mesenchymal transformation and predominantly mesenchymal-epithelial transformation. Control of this unusual malignancy requires new approaches to earlier detection and entirely new therapeutic innovations.



References, relevant publications in the European Journal of Radiology

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**Article VIII** *waiting for the prints*

**Supplement VIII** *waiting for the prints*

The mission of the Tabar Foundation is to support research and education to fight against breast cancer. Dr. Tabar's own photographs are now available as high-quality prints. All proceeds from your tax-deductible purchase will support young physicians who are learning how to detect breast cancer when it is still curable. Visit: [tabarfoundation.org](http://tabarfoundation.org)

