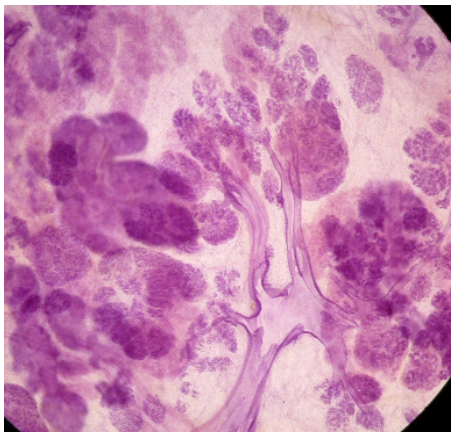
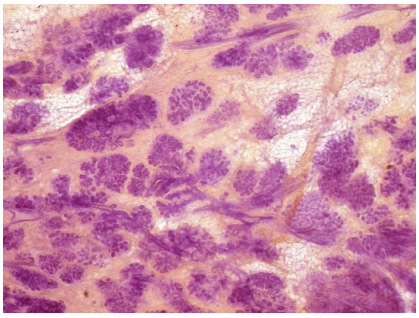
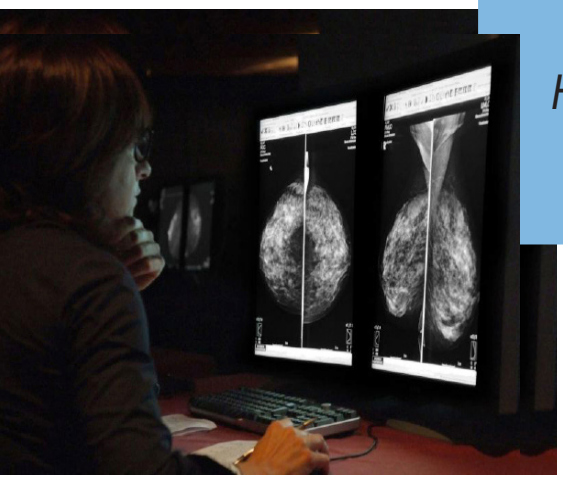


3D image of the breast tissue



The normal TDLUs have bud-like acini



Mammography Education, Inc.

2019

Oct 15-18

Hands-on Screening Course

combined with

Multimodality Diagnosis of Breast Diseases with Emphasis on Breast MRI

SIGTUNA

Hotel Kristina

Rektor Cullbergs väg 1, Sigtuna, 19323, Sweden

Faculty

LÁSZLÓ TABÁR, MD,FACR (Hon) **Course Director**

Professor emeritus of Radiology

and

MATS INGVARSSON, MD.

Headphysician, Dept. of Mammography, Falun, Sweden

Designed for:

Radiologists

This course teaches how to find breast cancer in its early stages and how to arrive at the correct diagnosis of breast diseases using the multimodality approach.

Course Overview:

* This Hands-on Breast Imaging course, led by László Tabár, MD, FACR, (Hon) will offer radiologists 250 full field digital mammography cases for screening during the official course hours.

* Normal mammograms will be mixed with proven abnormal cases.

* Reading will take place at high resolution work stations.

* During the course the attendees will progressively improve their interpretive expertise, as they learn the full spectrum of normal breast images, with all findings explained with the help of 3-dimensional histology images.

* These skills will lead to fewer call-backs and greater confidence in reading large number of mammograms.

* Feedback and discussion of every case by the Faculty after every reading session.

* Special emphasis will be placed on finding early phase breast cancers.

* All abnormal cases are fully worked up and the complete imaging workup will be presented in detail, including ultrasound, MRI and large section histopathology.

* Special sessions will describe the current clinical roles of breast MRI, review the image patterns of malignant breast diseases, correlate the findings with the underlying pathology.
* Description of the recent technical advances in breast MRI, including imaging protocols and techniques needed to produce high quality breast MRI images.
* Teaching how to characterize breast lesions utilizing multimodality imaging, breast MRI included.
* Learning MRI reading and interpretation at high resolution workstations.

Program Objectives:

1. Learn the full spectrum of normal mammograms through detailed explanation of the mammographic images.
2. Progressive improvement of the attendees' interpretive expertise.
3. Increase confidence in reading large numbers of full field digital mammograms at lower call-back rates.
4. Improve skills in detecting early phase breast cancer at digital mammography screening.
5. Greater proficiency in working up screen-detected findings.
6. Appreciate the clinical relevance of unifocal/multifocal/diffusely infiltrating breast cancers.
7. Emphasize the importance of multimodality approach to workup cases in a multidisciplinary environment.
8. Assess the clinical role of breast MRI in patient selection and in improving the detection, diagnosis and treatment of breast diseases.
9. Characterize breast lesions utilizing multimodality imaging, breast MRI included. The goal is to accurately and efficiently identify, interpret and report on breast MRI examinations

Attendees interpreting 250 digital mammography examinations will receive a **Certificate** confirming the actual number of mammographic and breast MRI examinations read under the direct supervision of an interpreting physician.

FACULTY

László Tabár, M.D., F.A.C.R. (Hon).
Course Director
Professor emeritus of Radiology,
Department of Mammography,
Central Hospital
Falun, Sweden

Mats Ingvarsson, MD.
Medical Director
Department of Mammography,
Central Hospital
Falun, Sweden

Mammography Education, Inc. is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians. Mammography Education, Inc. designed these medical education activities for a maximum of **28 credit hours in Category I** of the Physicians' Recognition Award of the American Medical Association. Each physician should claim only those hours of credit that he / she actually spent in the educational activity.

2019

Hands-on screening course combined with Multimodality Diagnosis of Breast Diseases with Emphasis on Breast MRI

László Tabár, MD, FACR (Hon)
and
Mats Ingvarsson, MD

1st DAY Lectures between 8:30 AM - 12:00 PM for all attendees Break at 10:00 AM

8:30 INTRODUCTION

8:45 DIDACTIC LECTURES COVERING: HOW TO READ A MAMMOGRAM? THE BASIS FOR EFFICIENT INTERPRETATION OF THE MAMMOGRAPHIC IMAGE

- Correlative 3-dimensional, subgross anatomy and mammography of the normal breast
- How to read a mammogram, how to interpret every nodular and linear density we see on the image.

MAMMOGRAPHIC PARENCHYMAL PATTERNS

- Practical implication, problems and solutions. Mammographic patterns and the risk of developing breast cancer. Understanding the mammograms of dense breasts.

HOW TO FIND THE INVASIVE BREAST CANCER WHEN IT IS STILL SMALL. SCREENING COMBINED WITH AN ANALYTICAL APPROACH FOR THE DIFFERENTIAL DIAGNOSIS OF STELLATE/SPICULATED AND CIRCULAR/OVAL-SHAPED LESIONS

- A systematic method for viewing mammograms.
- Areas on the mammogram where most breast cancers will be found
- Viewing "difficult to read" mammograms and viewing relatively easy-to-read cases

THE PROBLEM OF VIEWING THE MAMMOGRAMS OF WOMEN WITH DENSE BREASTS. DEMONSTRATION OF A POTENTIAL SOLUTION

Lunch 12:00 PM - 1:00 PM

v

2019

Hands-on screening course combined with
Multimodality Diagnosis of Breast Diseases with
Emphasis on Breast MRI

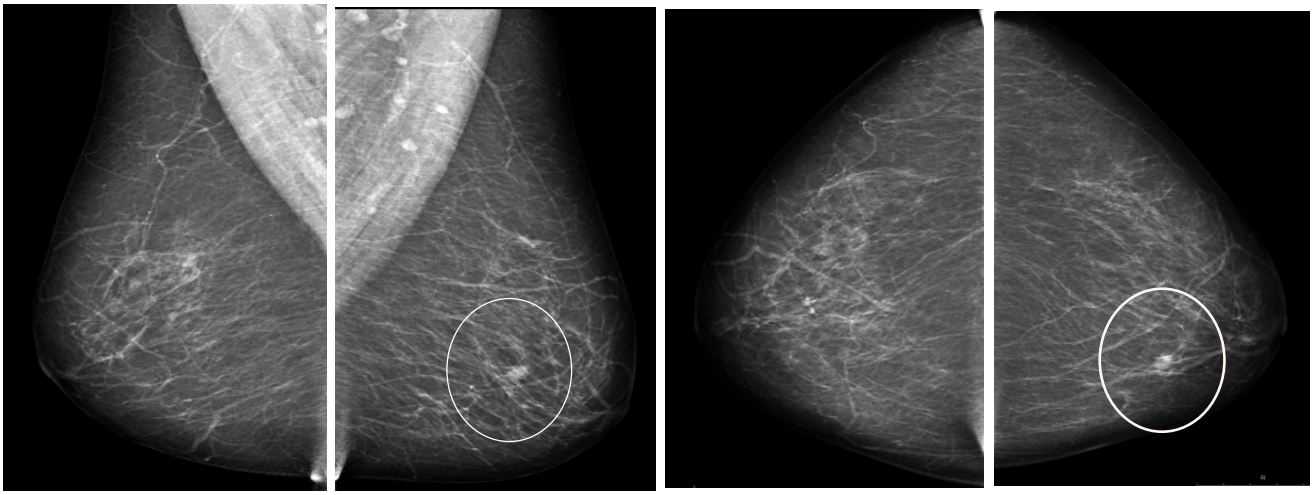
László Tabár, MD, FACR (Hon)
and
Mats Ingvarsson, MD

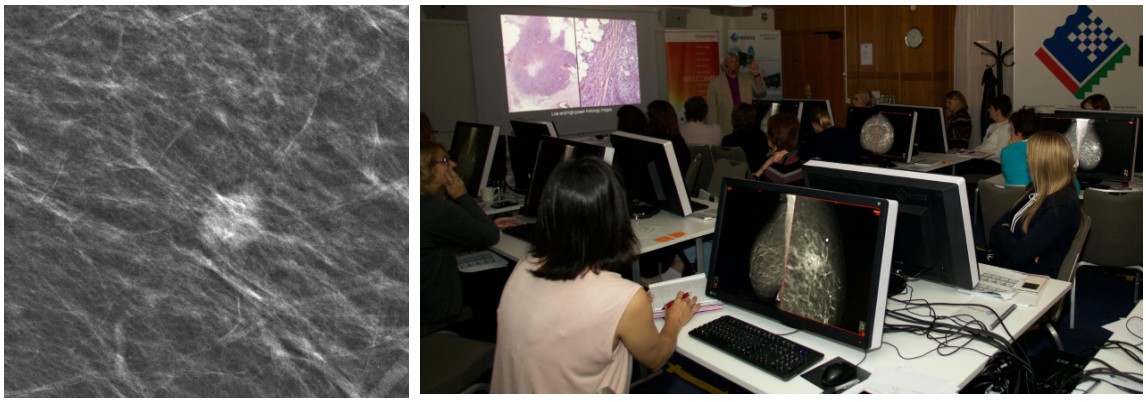
1st day **Afternoon program between 1:00 PM - 5:30 PM** **Breaks at 2:15 and 3:30 PM**

1:00 - 2:15 **HANDS ON SCREENING.** *SESSION 1.*

Break: 2:15 - 2:30 PM

2:30 - 3:30 DISCUSSION OF THE SCREENING CASES FROM *SESSION 1*





Hands-on training in screening

Break: 3:30 - 3:45 PM

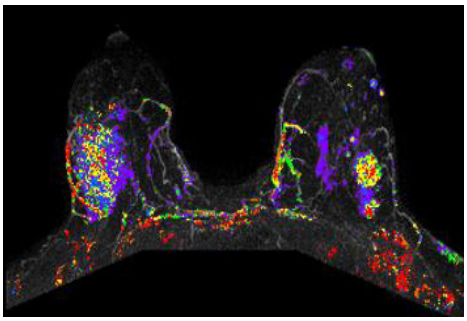
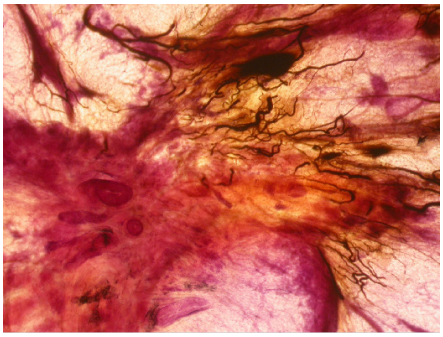
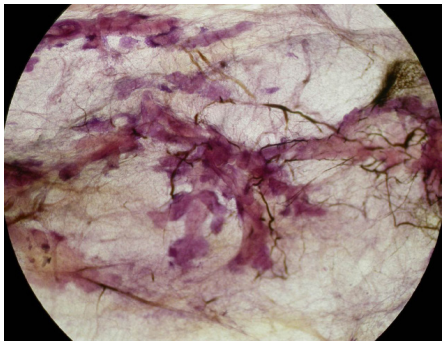
3:45 - 5:00 INTRODUCTION to CONTRAST ENHANCED BREAST MRI. Basic techniques and interpretation. Mats Ingvarsson (see page VII)

5:00 PM End of Day 1

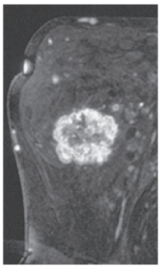
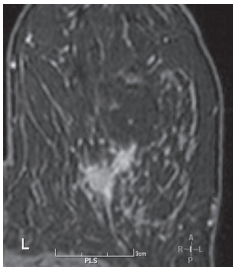
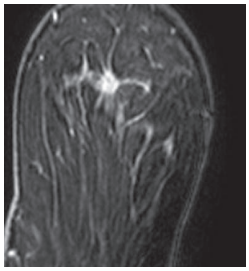
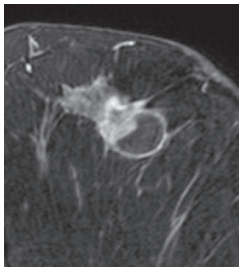
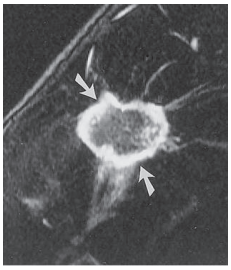
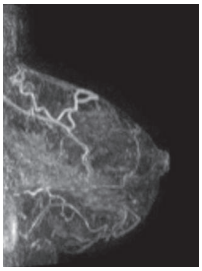
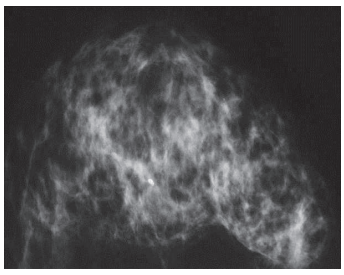
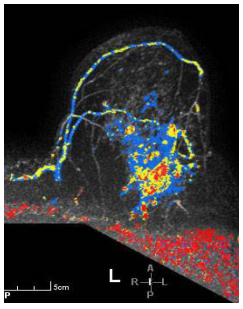
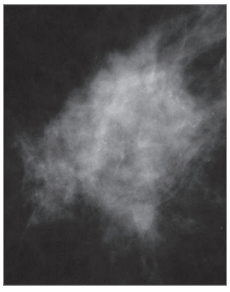
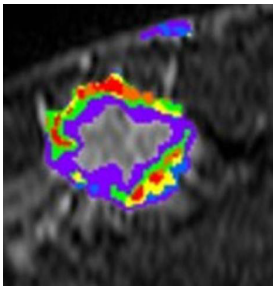
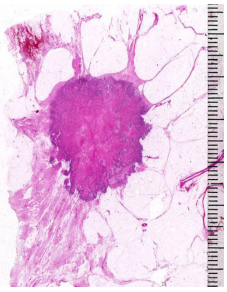
7:00 PM Course dinner

1st day **Afternoon program -** photographs assisting the MRI session

INTRODUCTION to CONTRAST ENHANCED BREAST MRI. **Basic techniques. -** Mats Ingvarsson

BASICS of BREAST MRI INTERPRETATION **-** Mats Ingvarsson

We would like to thank EIZO and Carestream for providing the viewing stations and the engineering expertise at this teaching seminar.

2nd DAY AM Hands-on screening and didactic lecture series 8:00 AM - 12:00 PM

8:00 - 9:15 HANDS ON SCREENING WITH MAMMOGRAPHY. *SESSION 2.*

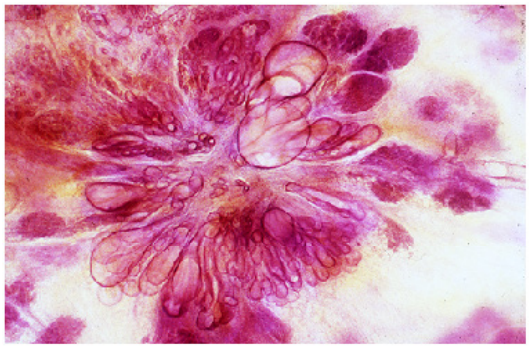
9:15 - 9:30 and **10:30 - 10:45 AM** Breaks

9:30 -10:30 DISCUSSION OF THE SCREENING CASES FROM *SESSION 2*

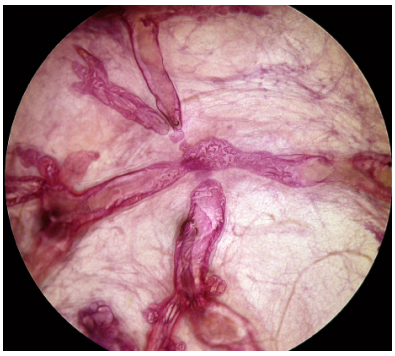
10:45 **DIDACTIC LECTURE SERIES COVERING THE FOLLOWING TOPICS:** The site of origin of the breast cancer influences diagnosis, choice of treatment and patient outcome.

NON-CALCIFIED ASYMMETRIC DENSITIES WITH architectural distortion on the mammogram.

ANALYSIS of BENIGN RADIATING STRUCTURES on the mammogram, originating in the ducts: Radial scar



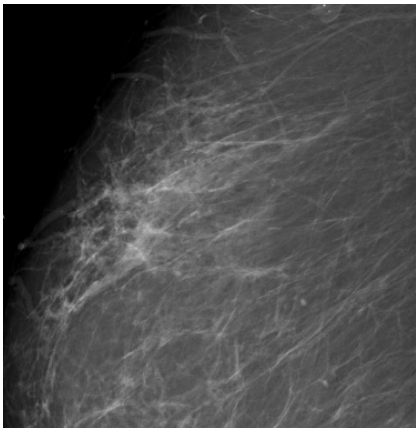
Radial scar

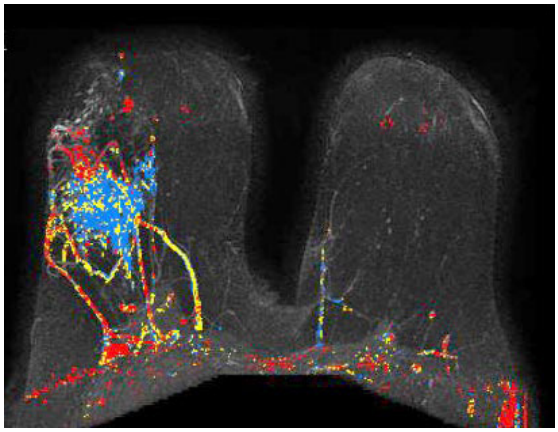


Neoductgenesis

ANALYSIS of MALIGNANT LESIONS PRESENTING as RADIATING STRUCTUREs on the mammogram. Clinical presentation, mammographic appearance and outcome

1) Duct forming invasive carcinoma / Neoductgenesis cases presenting on the mammogram as architectural distortion. The role of MRI in diagnosing diffuse breast carcinoma



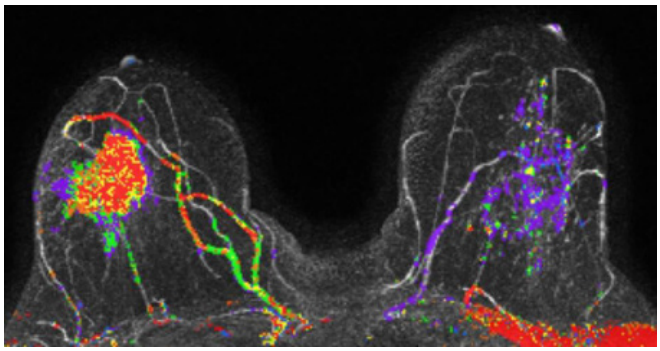


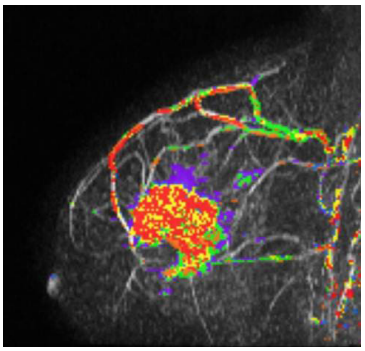
Non-calcified architectural distortion: extensive duct forming invasive cancer

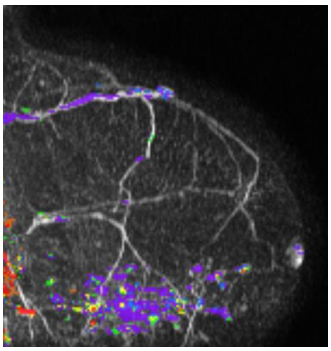
Lunch 12:00 PM-1:00 PM

2nd day afternoon Mammography and MRI Interpretation sessions at workstations between **1:00** PM **- 5:00** PM

1:00 - 2:15 MRI Interpretation sessions at workstations - Mats Ingvarsson, MD







2:15 - 2:30 and **3:30 - 4:00 PM** Breaks

2:30 - 3:30 HANDS ON SCREENING WITH MAMMOGRAPHY. *SESSION 3.*

4:00 - 5:00 DISCUSSION OF THE SCREENING CASES FROM *SESSION 3*

5:00 End of Day 2

3rd DAY AM Hands-on screening and didactic lecture series 8:00 AM - 12:00 PM

8:00 - 9:00 **HANDS ON SCREENING WITH MAMMOGRAPHY.** *SESSION 4.*

9:00 - 9:15 and **10:15 - 10:30 AM** Breaks

9:15 -10:15 DISCUSSION OF THE SCREENING CASES FROM *SESSION 4*

10:00 ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

See pages X and XI.

BREAST DISEASES ORIGINATING IN THE MAJOR DUCTS

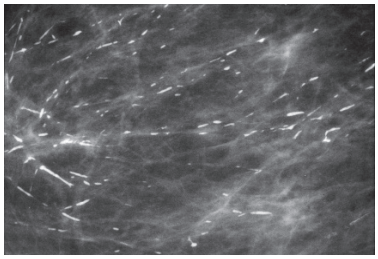
- **Benign type calcifications** originating in the major ducts

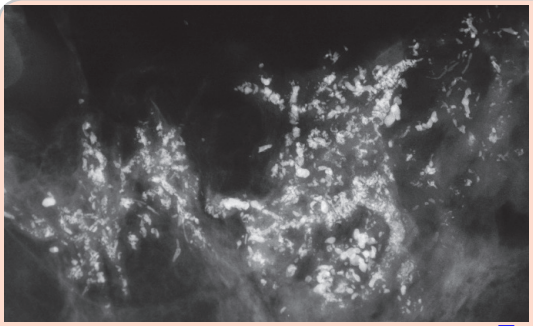
  a) Secretory disease type calcifications

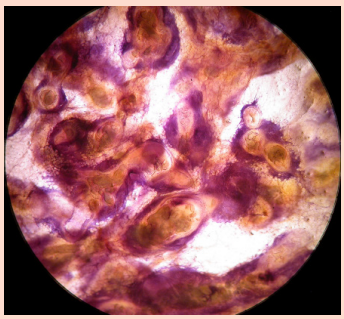
- **Malignant type calcifications** originating in the major ducts:

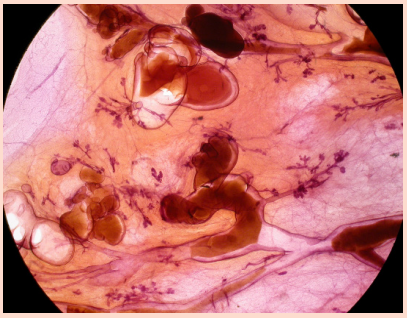
Four different types of calcifications: a) fragmented casting type, b) dotted, snake skin-like, c) skipping stone-like and d) pearl necklace-like

Benign plasma cell mastitis type calcifications in major ducts

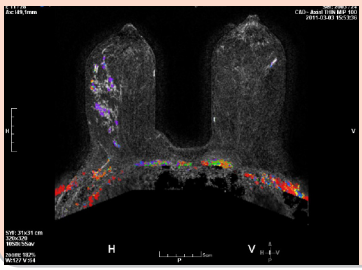


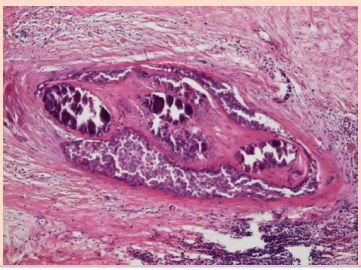






a) Fragmented casting type calcifications. Example 1.





Example 2.
Fragmented casting type calcifications (breast cancer of ductal origin DAB).

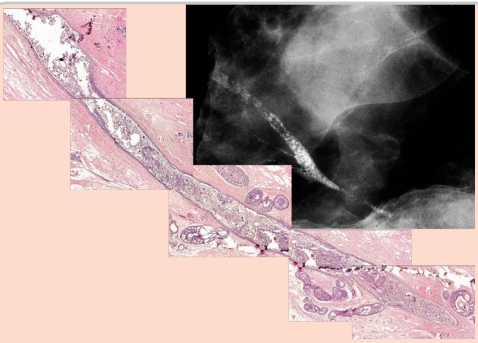
Lunch 12:00 PM - 1:00 PM

3rd DAY AM ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

Images supporting the morning lecture:

ANALYSIS of CALCIFIED MALIGNANT BREAST LESIONS ORIGINATING in the MAJOR DUCTS, cont.

Clinical presentation, mammographic appearance and patient outcome.The role of MRI in diagnosing diffuse breast carcinoma - Tabar L, Ingvarsson, M.



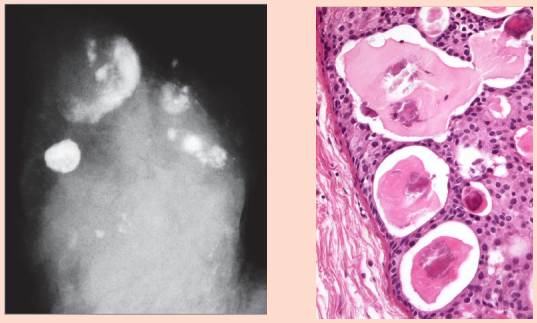
b) Dotted casting type calcifications

snake skin-like

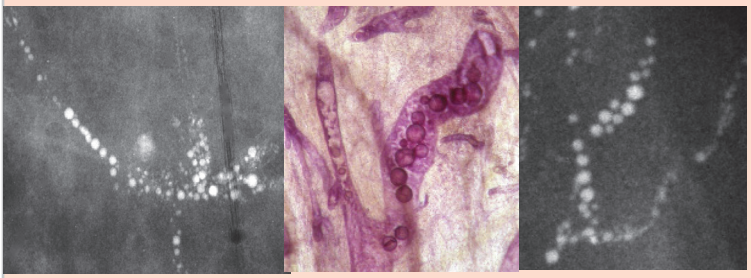
* The concept of **neoductgenesis**. Long-term follow-up results. New aspects, correct terminology.

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

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



c) Skipping stone-like calcifications



d) Pearl necklace-like calcifications

Practice of calcification analysis. Faculty-audience interaction.

Lunch 12:00 PM - 1:00 PM

3rd DAY PM MRI interpretation and hands-on screening **Breaks** at **2:15** and at 3:30 PM

1:00 - 2:15 MRI INTERPRETATION SESSION AT WORKSTATIONS.

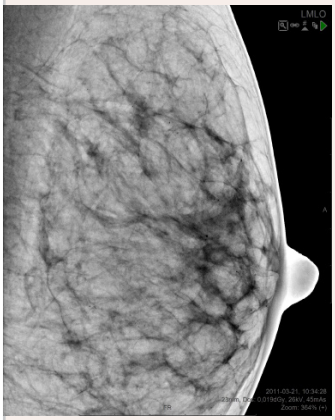
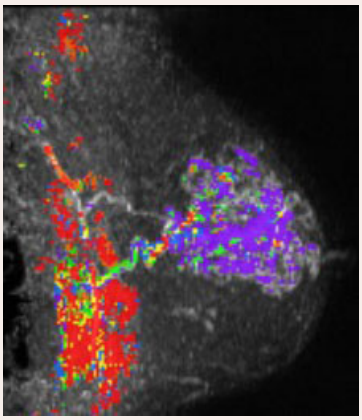
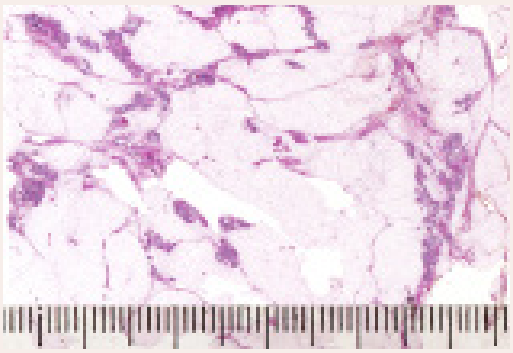
2:30 - 3:30 HANDS ON SCREENING WITH MAMMOGRAPHY. *SESSION 5.*

4:00 -5:00 DISCUSSION OF THE SCREENING CASES FROM *SESSION 5*

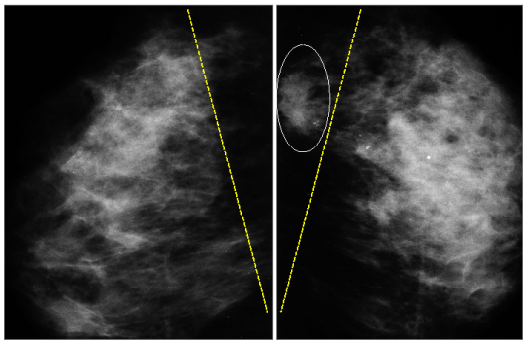
5:00 PM End of Day 3

3rd DAY PM MRI interpretation and hands-on screening

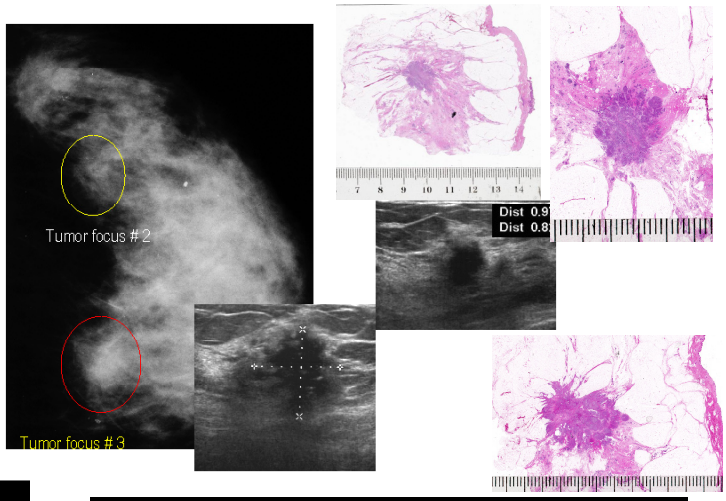
Cases supporting the MRI workshop

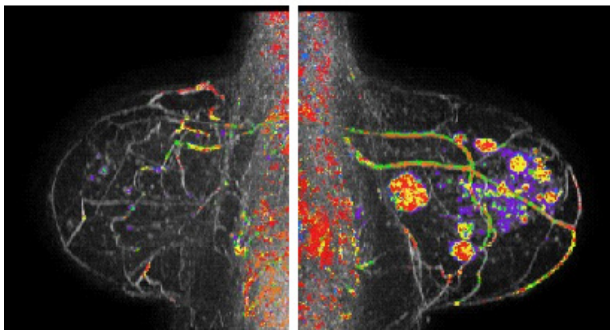
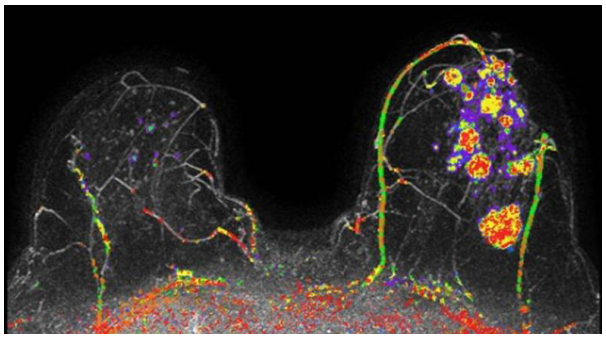




Subtle mammography finding / MRI shows that the entire lobe is filled with a diffuse breast cancer, confirmed at histology



Multifocal invasive and in situ carcinoma
on an area measuring 180X60 mm pN 4/9



5:00 PM End of Day 3

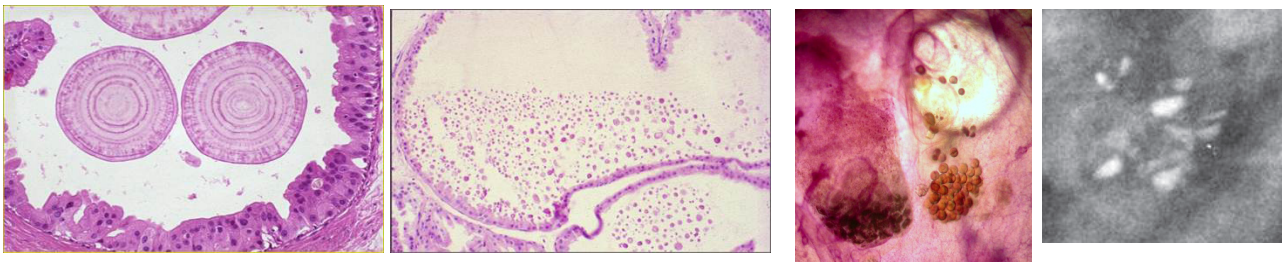
4th day **Morning program between 8:00 AM - 12:00 PM Breaks at 9:15 and at 10:00 AM**

8:00 - 9:00 HANDS ON SCREENING. *SESSION 6* *a)* Normal cases mixed with *b)* cases having non-calcified architectural distortion, (both duct forming invasive carcinoma *and* diffusely infiltrating breast caancers) *c)* calcifications localized within the major ducts and TDLUS. *d)* 1-14 mm unifocal and multifocal stellate and circular tumors.

9:15-10:00 DISCUSSION OF THE SCREENING CASES FROM *SESSION 6*

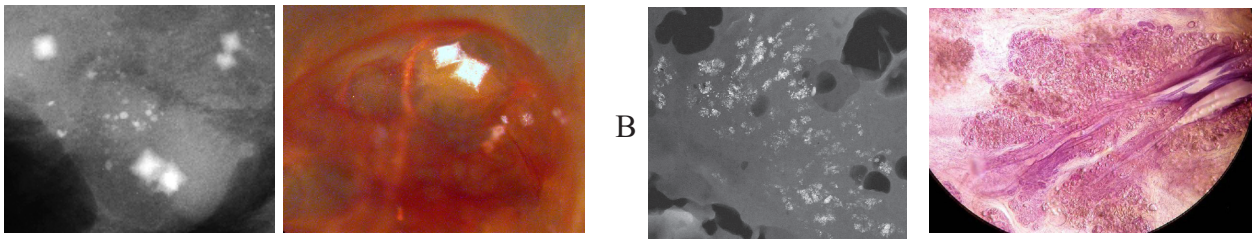
10:15 ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

- **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.



A

- Conventional and 3D histology images of small breast cysts containing sediment of psammoma 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), pleomorphic calcifications on the mammogram.



B

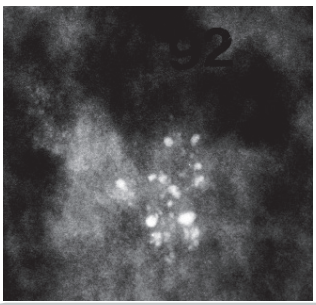
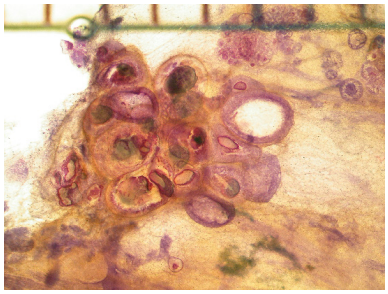
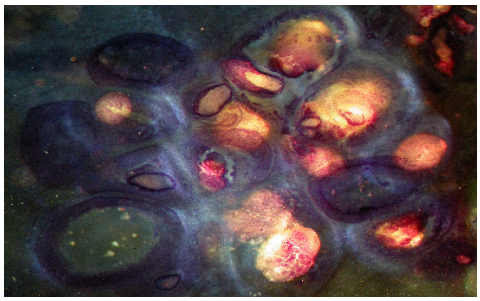
12:00 Lunch

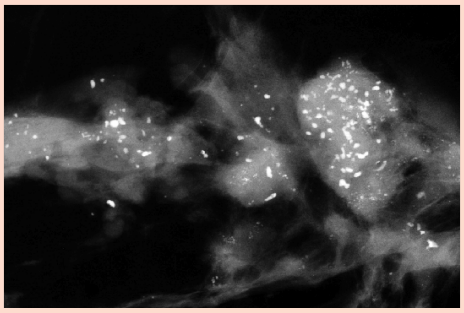
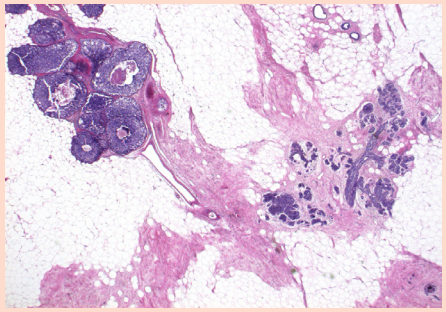
4th day

Afternoon program between 1:00 PM - 4:00 PM **Breaks** at **2:00** and at **3:00 PM**

1:00 PM **THE DIDACTIC LECTURE SERIES WILL COVER THE FOLLOWING TOPICS:**

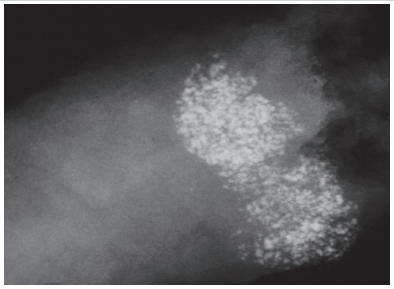
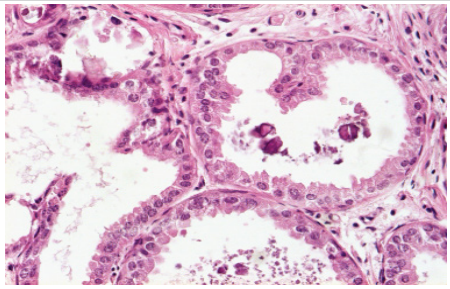
Grade 2 cancer *in situ:* Mammographic / 3-D histologic / MRI correlation of cases with crushed stone-like/pleomorphic calcifications on the mammogram.

Mammographic / histologic correlation of pleomorphic calcifications

- 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.

4:00 PM End of Course

For more information and registration please contact:

Mammography Education, Inc., 4429 E. Spur Drive
CAVE CREEK, AZ 85331, USA. Ms. Donna Sokolik

Phone: (480) 419 0227, Fax: (480) 419 0219, E-mail: info@mammographyed.com

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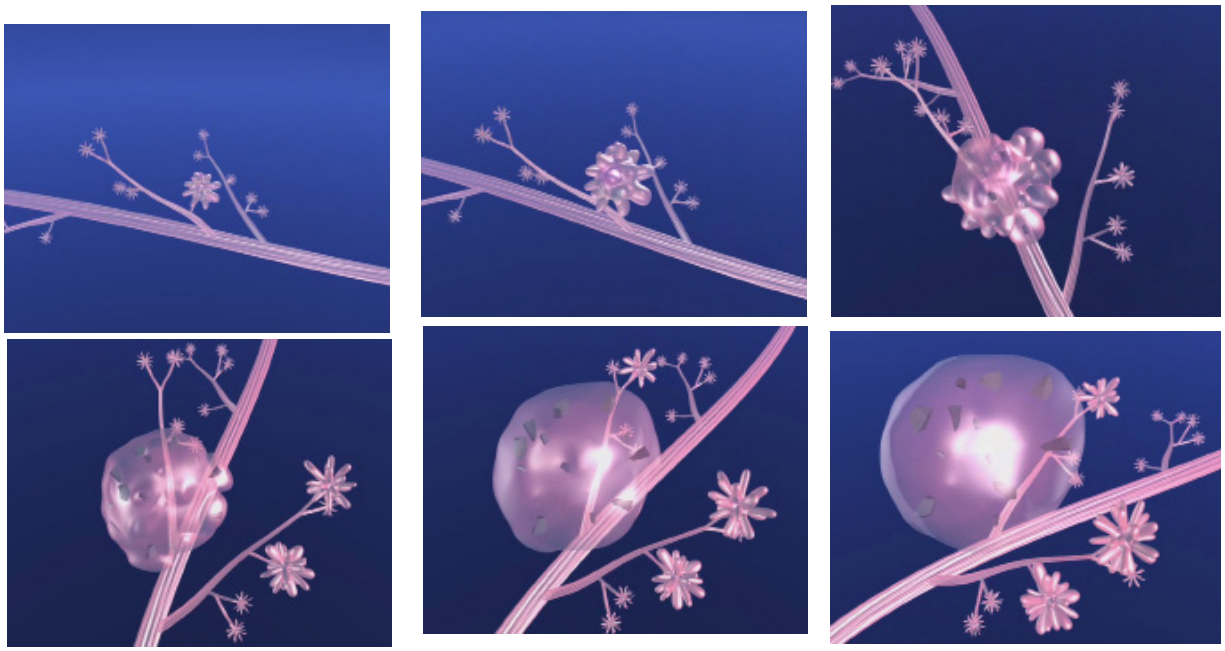
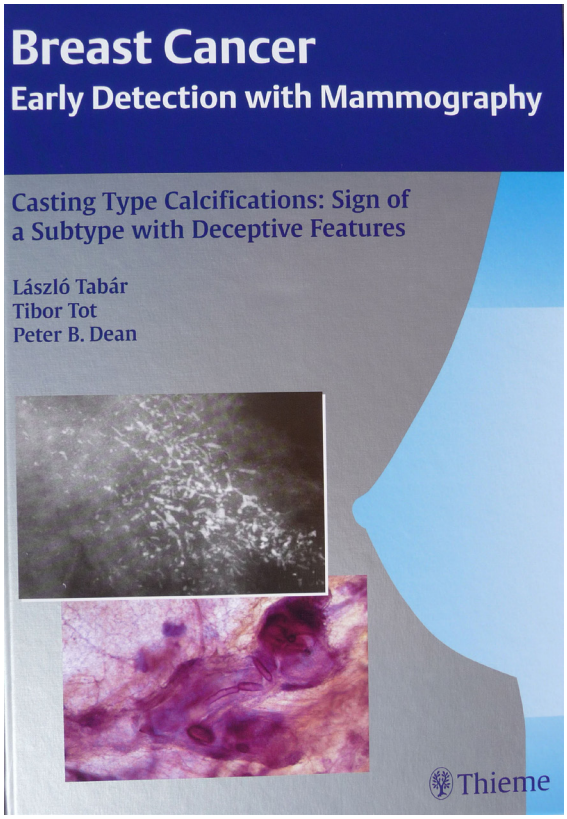


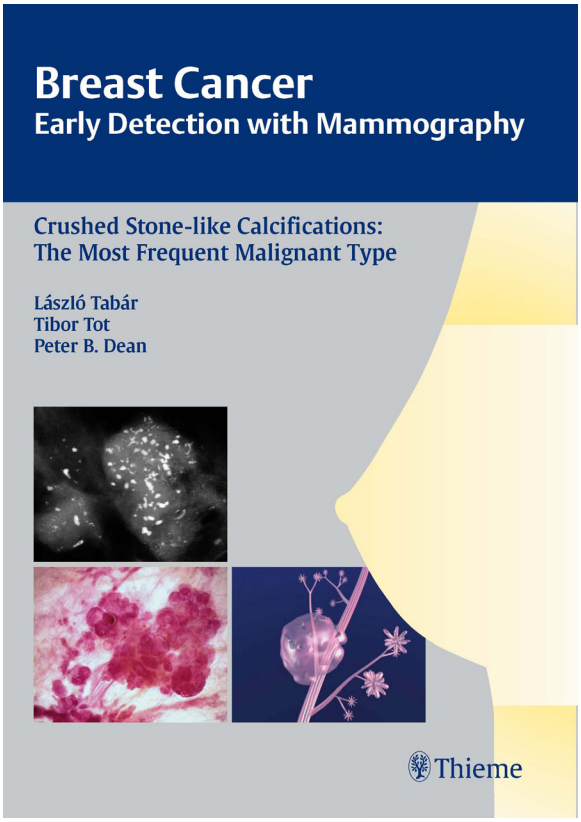
Computer simulation images of the development of Grade 2 *in situ* carcinoma within the TDLU. The lobule becomes gradually distended and deformed. Calcifications are formed within the necrotic debris and are seen on the mammogram as **crushed stone-like calcifications**.

2019

Hands-on screening course combined with Multimodality Diagnosis of Breast Diseases with Emphasis on Breast MRI

László Tabár, MD, FACR (Hon)
and
Mats Ingvarsson, MD





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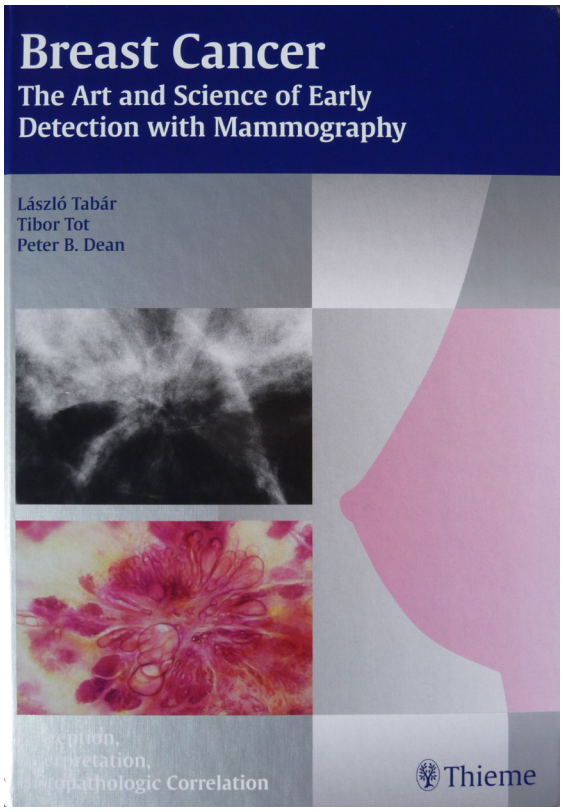

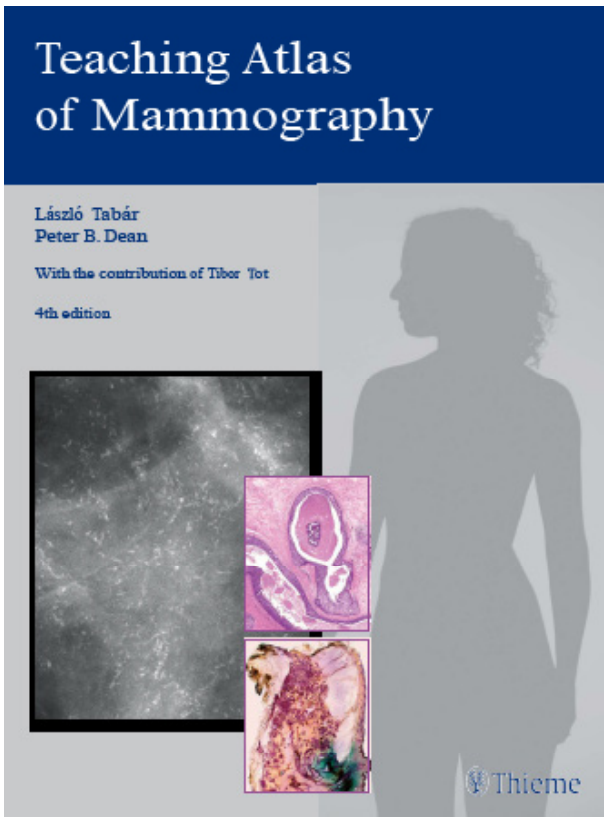

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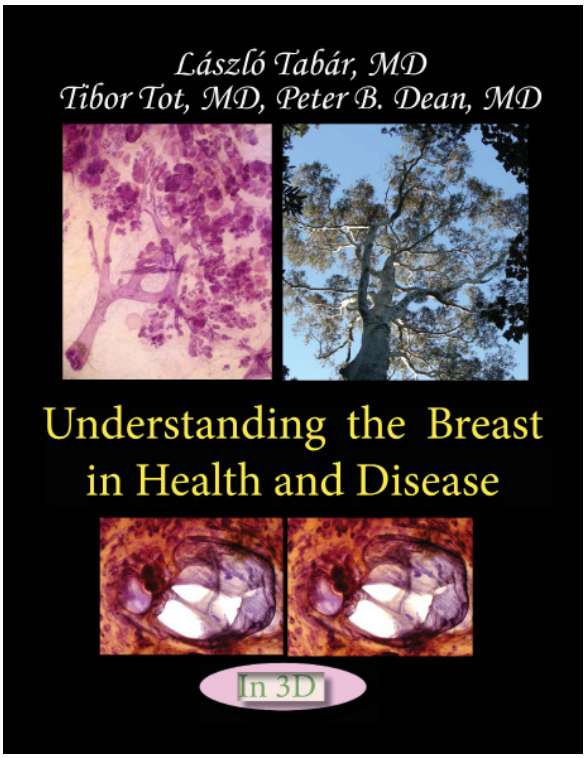

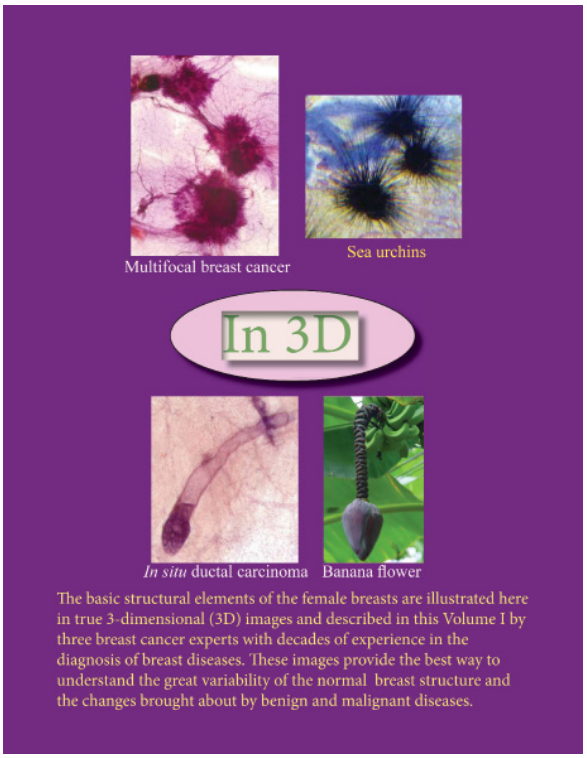

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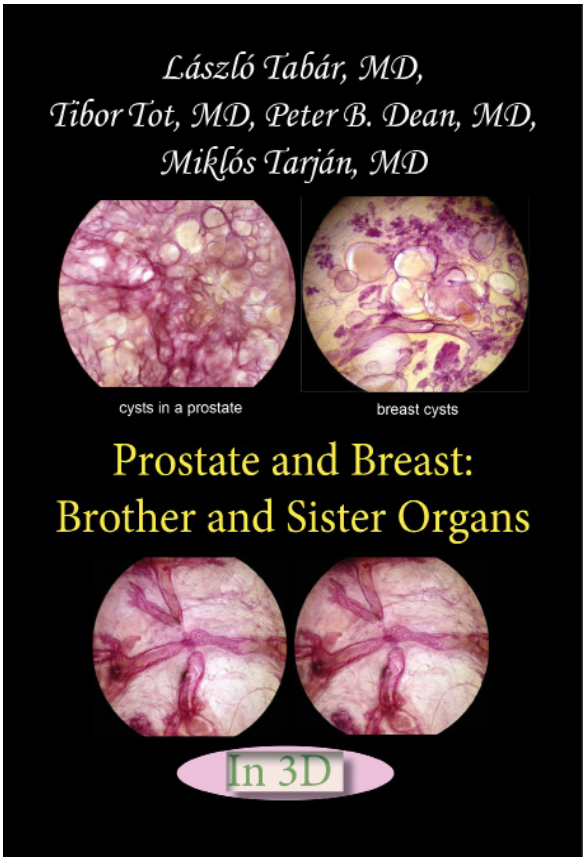

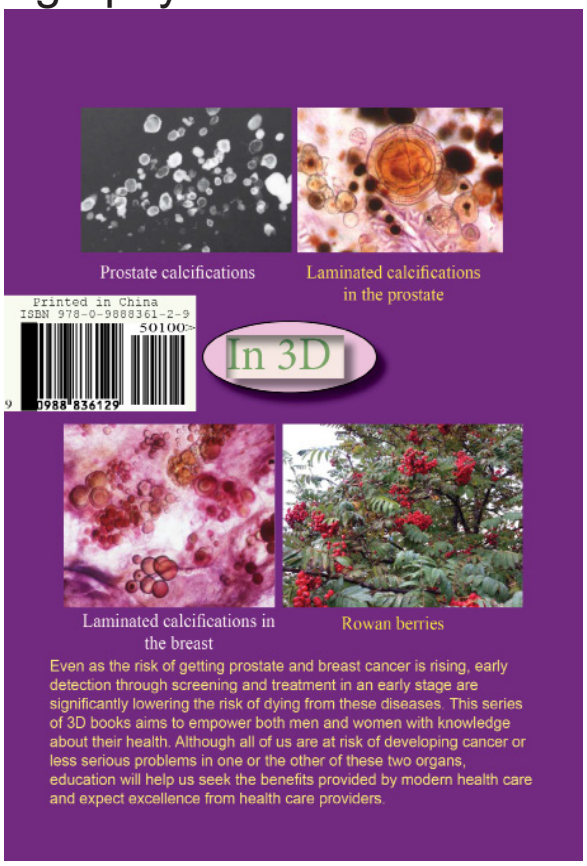

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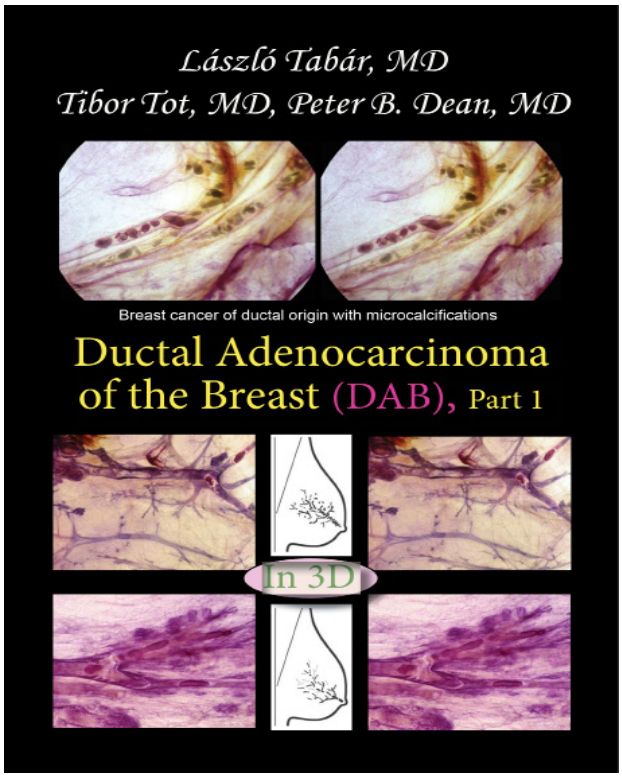

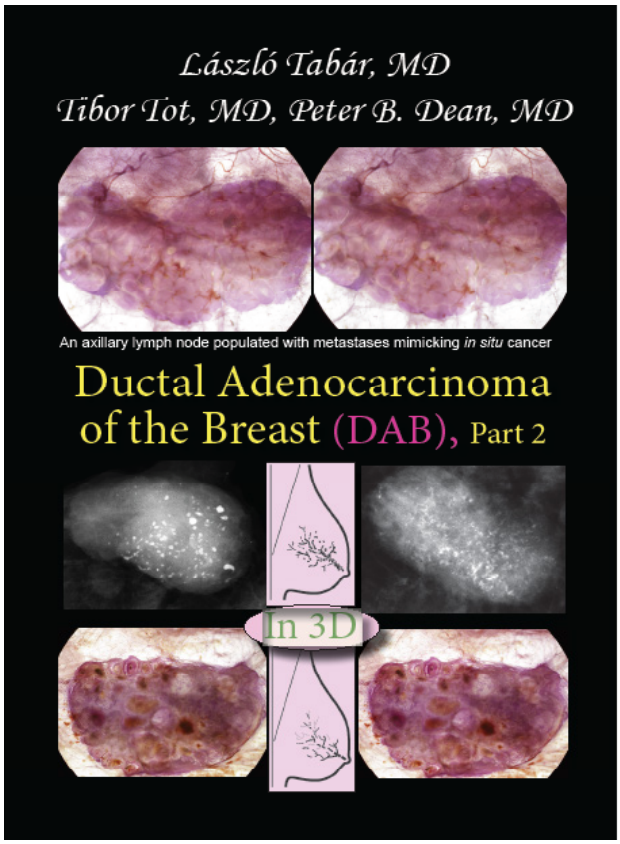

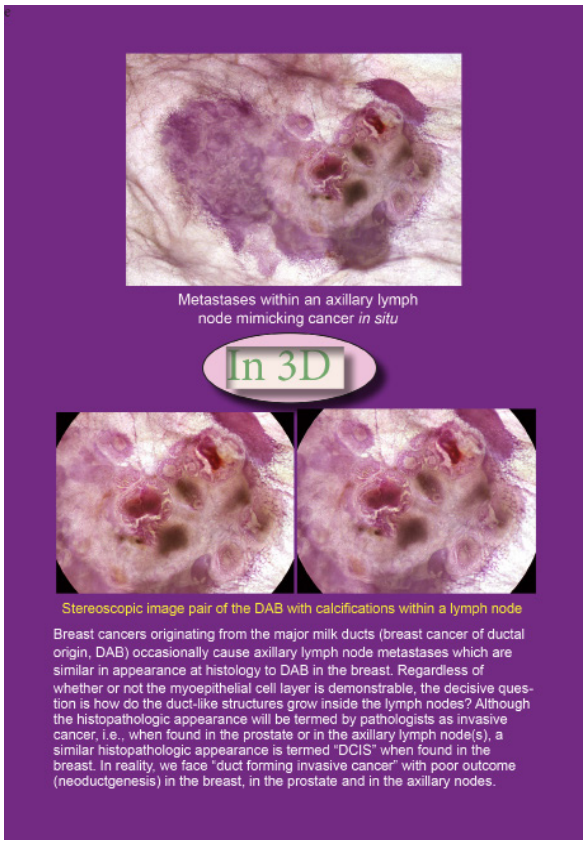

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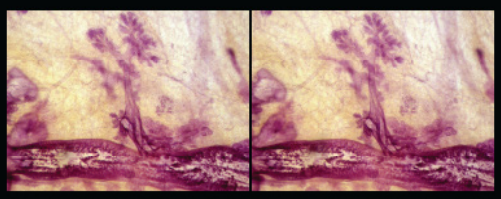
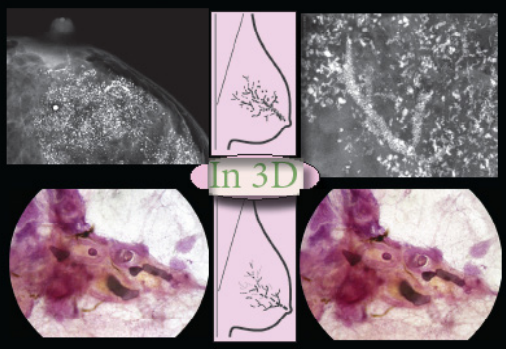
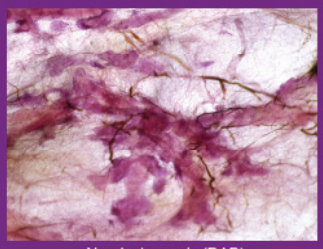
Tibor Tot, MD, Peter B. Dean, MD



Micropapillary breast cancer of ductal origin associated with a normal TDLU

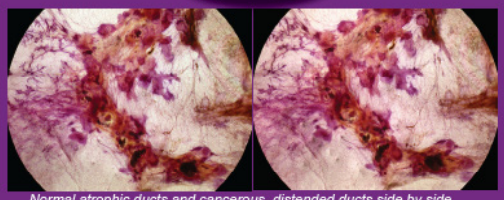
Ductal Adenocarcinoma of the Breast (DAB), Part 3





Neoductgenesis (DAB)
associated with angioneogenesis

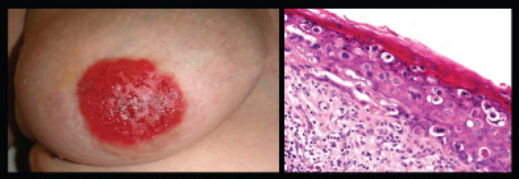
In 3D



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.

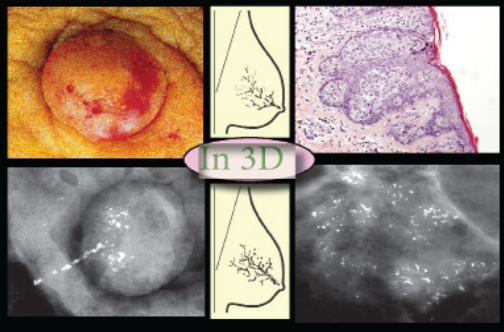
László Tabár, MD
Tibor Tot, MD, Peter B. Dean, MD

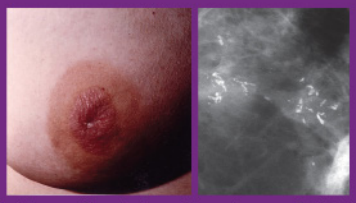


Paget's disease of the nipple

Paget's cells in the epidermis of the nipple

Ductal Adenocarcinoma of the Breast (DAB), Part 4





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

In 3D

Cancer-filled duct in Paget's disease with angioneogenesis

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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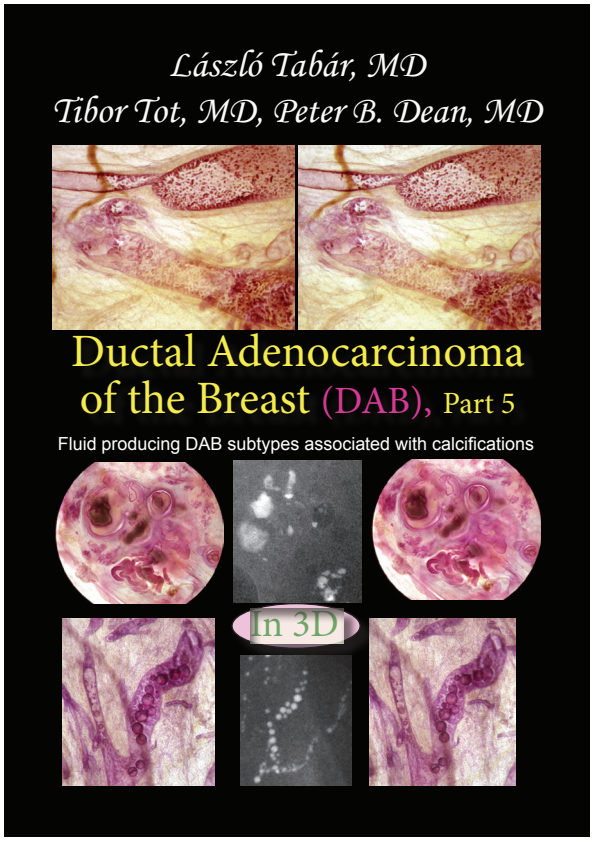

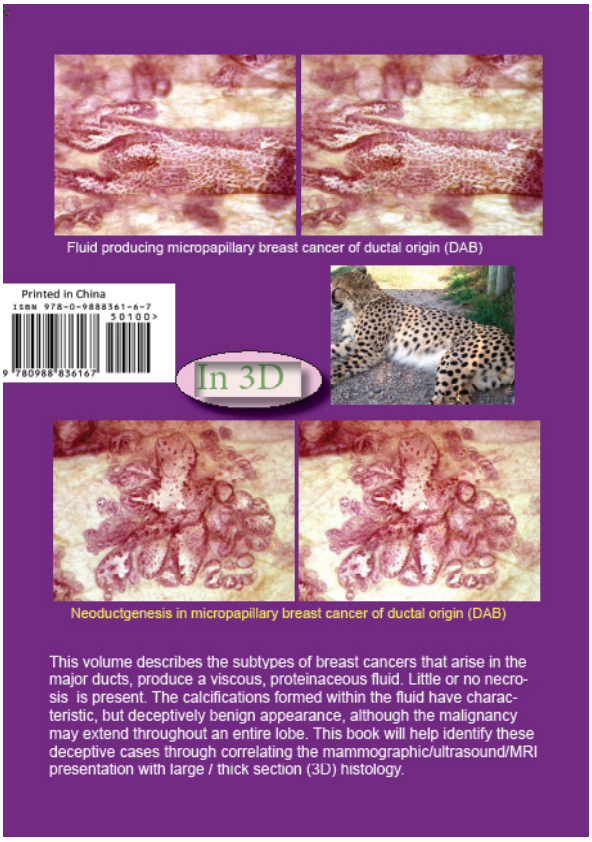

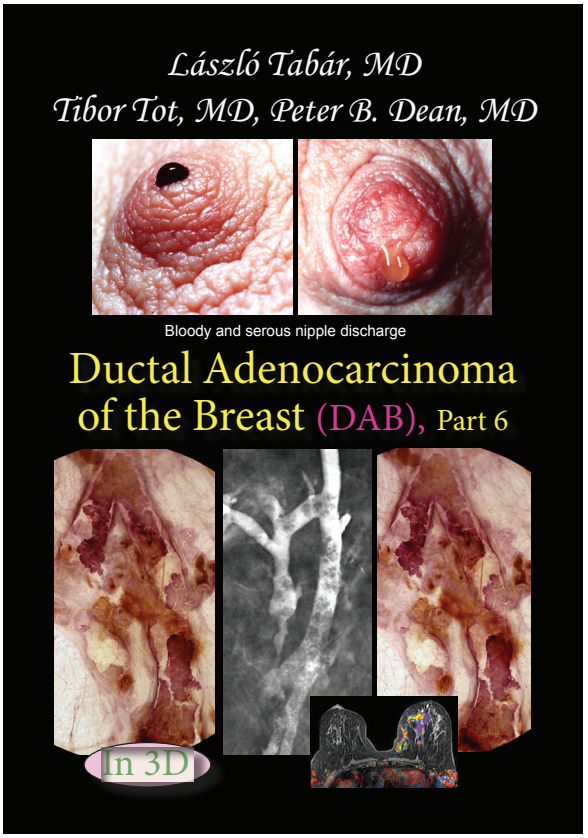

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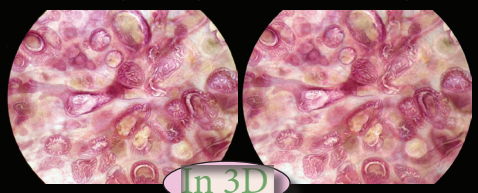
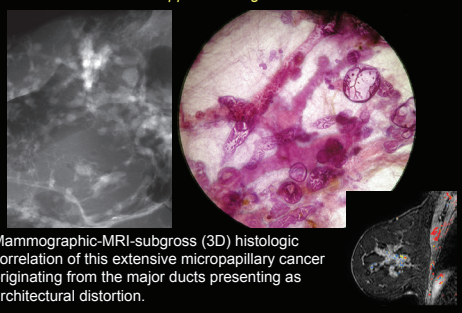


In 3D

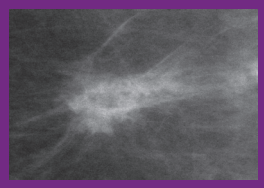
Breast cancer originating from the major ducts

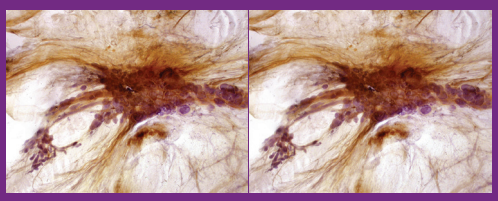
Ductal Adenocarcinoma of the Breast (DAB), Part 7

Architectural distorion 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 distorion on the mammogram without calcifications or nipple discharge

In 3D

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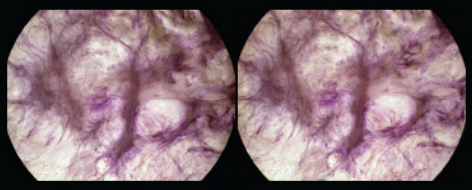
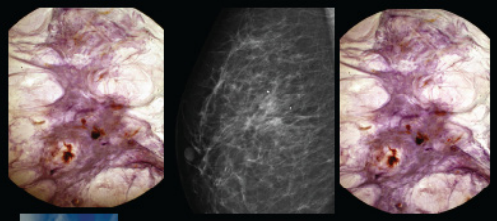
There are two main groups of diffuse breast cancers presenting on the mammogram as large regions of architectural distortion; these account for about 25% of all breast cancers and tend to have a poor outcome: 1) **Neoductgenesis,** i.e. "duct forming invasive carcinoma", the topic of this volume, often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

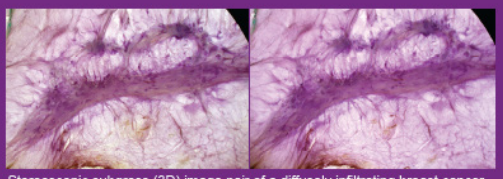
László Tabár, MD
Tibor Tot, MD, Peter B. Dean, MD
Olga Puchkova, MD



Diffusely infiltrating breast cancer, Part 1



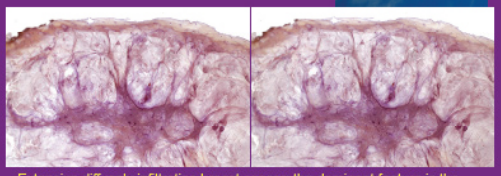
In 3D



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

ISBN 978-0-9888361-2-9
53500

In 3D

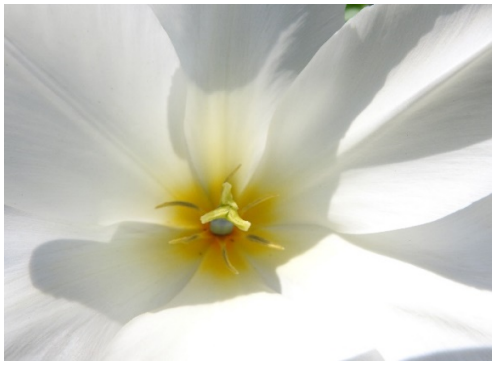


Extensive diffusely infiltrating breast cancer: the dominant feature is the extreme amount of connective tissue with concave contours.

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.

2019

Hands-on screening course combined with
Multimodality Diagnosis of Breast Diseases with
Emphasis on Breast MRI

László Tabár, MD, FACR (Hon)
and
Mats Ingvarsson, MD

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