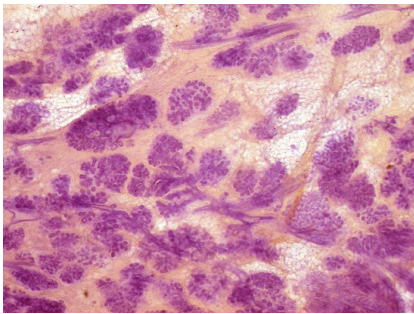
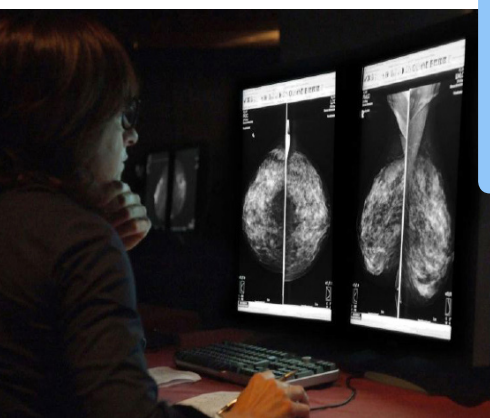


3D image of sclerosing adenosis



The normal TDLUs have  
bud-like acini

**28** Category I CME  
credit hours



*Mammography Education, Inc.*



**2020**

*Sept 8-11*

**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.



2020

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

## 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.



2020

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

## 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.



2020

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

## 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

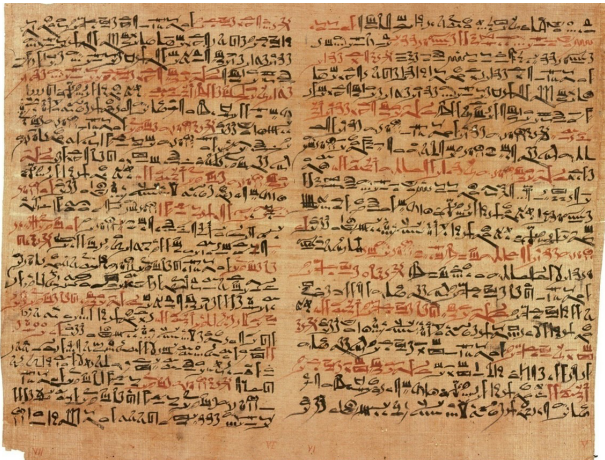
*Department of Mammography,  
Central Hospital  
Falun, Sweden*

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.

**Day 1** Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

**8:30 AM** INTRODUCTION FOLLOWED BY DIDACTIC LECTURES COVERING:

- A NEW ERA in the DIAGNOSIS and TREATMENT of BREAST CANCER. A historical perspective.



The Edwin Smith papyrus



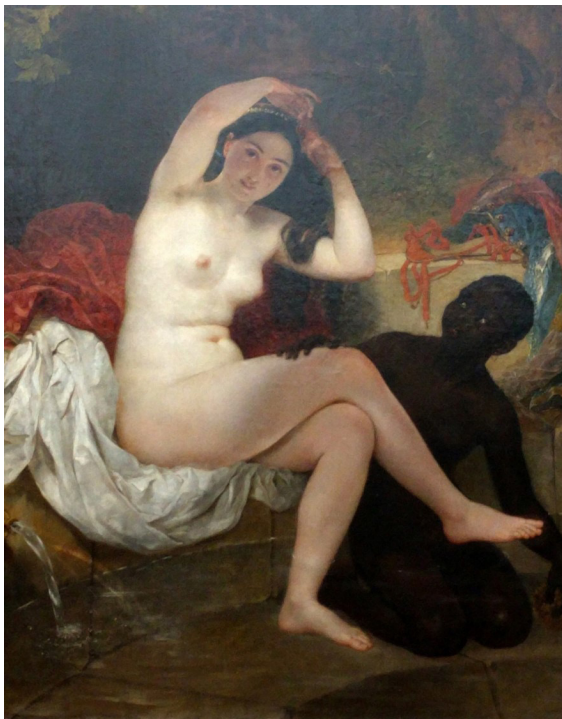
葛洪 (283年—343年)  
东晋 **Master Hong Ge**

《肘後備急方》其卷五  
治癰疽、妒乳諸毒腫方

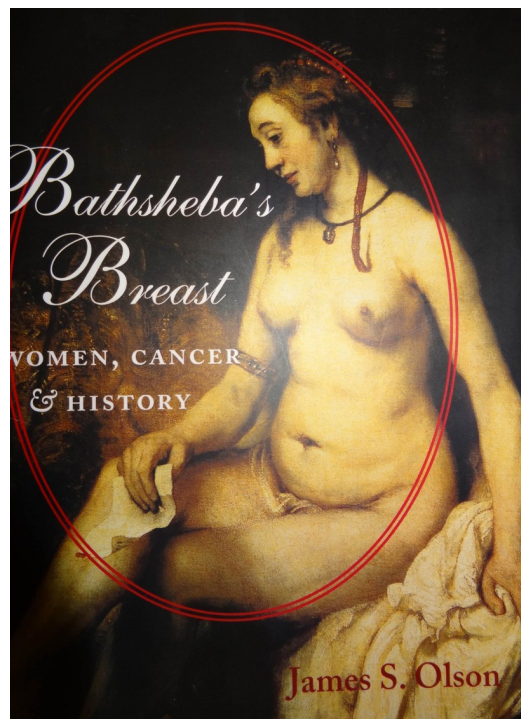
**"Hard as Rock"**  
「癰結腫堅如石，或如  
大核，色不變，或做石  
癰不消」 **No Change in  
Skin Color**



Tu Youyou,  
Chinese pharmaceutical chemist, 2015 Nobel Prize in Physiology or Medicine.  
Got the idea from same book and discovered artemisinin and dihydroartemisinin with  
colleagues, used to treat malaria, which has saved millions of lives.



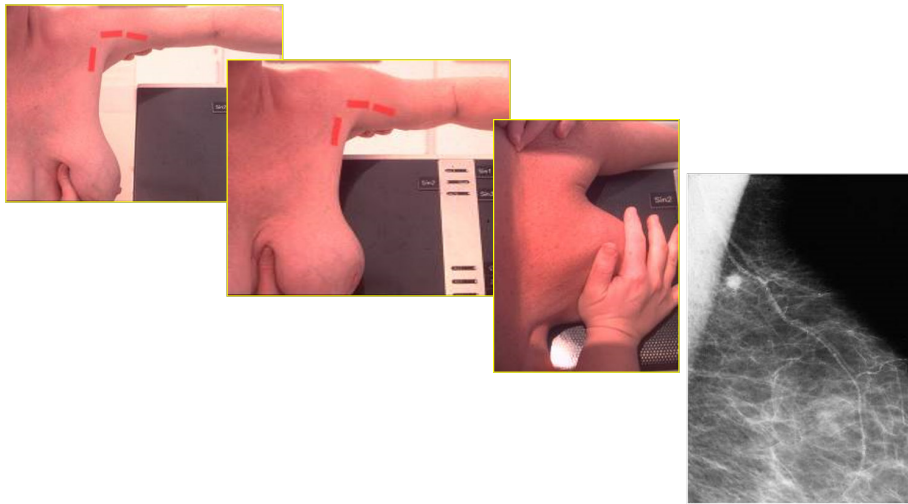
The young Bathsheba by Briullov,  
Moscow, Tretyakov museum



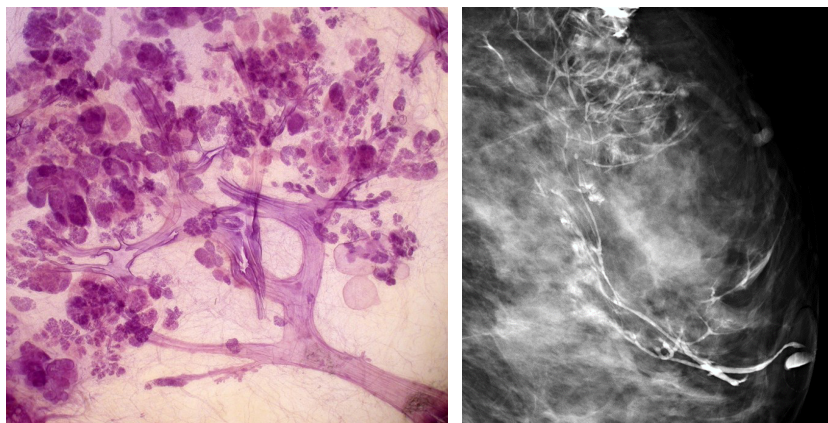
Rembrandt's painting of Bathsheba

**Day 1** Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

A major technical development in the mid-70s: **the invention of low dose film-screen mammography** made it possible to find breast cancers in their non-palpable phase.

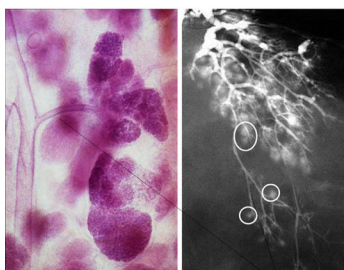


- **THE MAGICAL ROLE OF LARGE FORMAT, SUBGROSS HISTOPATHOLOGY IN TRAINING**
- Correlating 3-dimensional, subgross anatomy with mammography of the normal breast results in **increased confidence in reading a mammogram** and **finding small abnormalities**. Special training in large format thin and thick section (stereoscopic) histopathologic correlation enables the radiologist to account for every linear and nodular density on the mammogram.

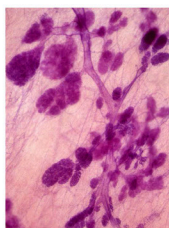
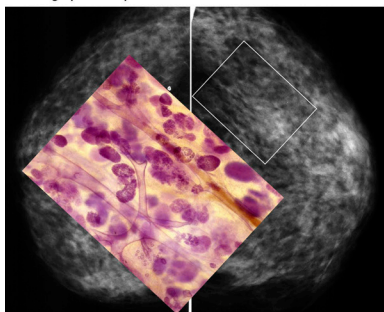


**Day 1** Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

**NORMAL BREAST ANATOMY**

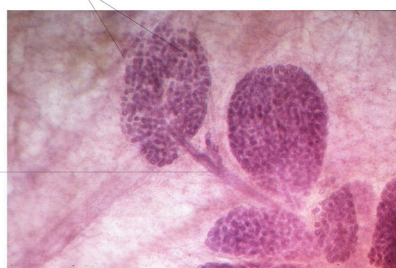


TDLUs on 3D histology and on a galactogram. Terminal duct  
Illustration of subgross breast anatomy using 3D histologic-  
mammographic comparison.

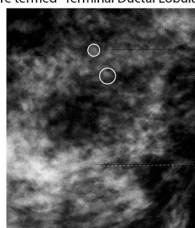


Three of the four basic building  
blocks (TDLU, ducts and fibrous  
tissue) are discernable on this 3D  
histology slice.

A lobule consists of 40-60 ductules / acini. This is the site of milk  
production and also 75% of breast cancers originate from the cells  
lining the acini (AAB, acinar adenocarcinoma of the breast).

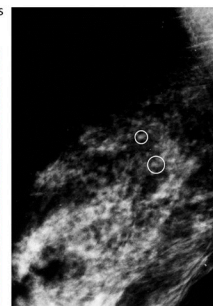


Large format thick section (subgross, 3D) histology image of  
neighboring TDLUs. The lobule and the terminal duct  
combined are termed "Terminal Ductal Lobular Unit (TDLU)".

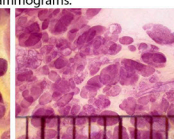
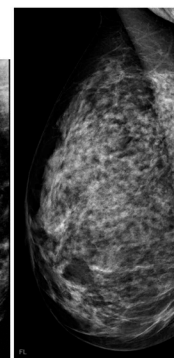


TDLUs

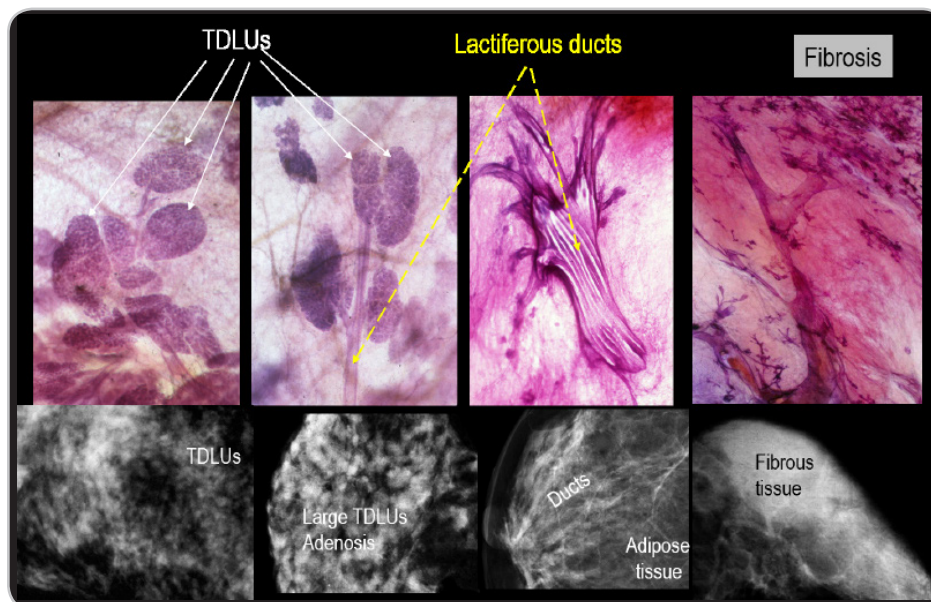
Milk ducts



Three of the four basic building blocks (TDLU, ducts and adipose  
tissue) are discernable on these mammograms.



The size of a normal TDLU  
varies between 0.7 - 1.5 mm.



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

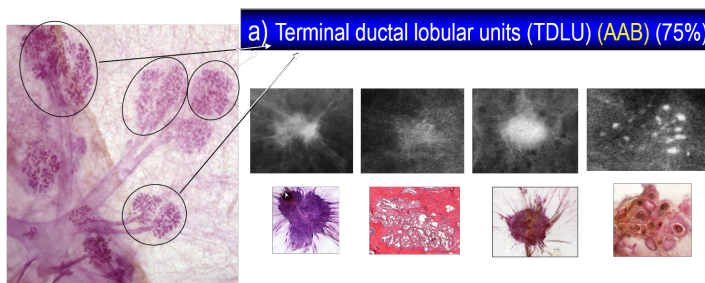
## Day 1 Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

### ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

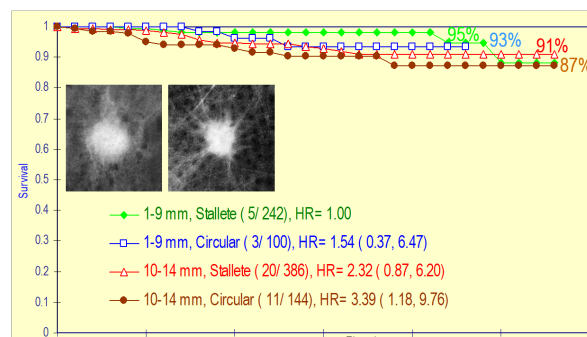
**HOW TO FIND THE INVASIVE BREAST CANCER WHEN IT IS STILL SMALL.** *Malignant stellate and circular/oval-shaped lesions originating from the TDLUs (AAB):* clinical presentation, histology, mammographic - MRI - ultrasound appearance and outcome.

- 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
- **Interactive screening 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.

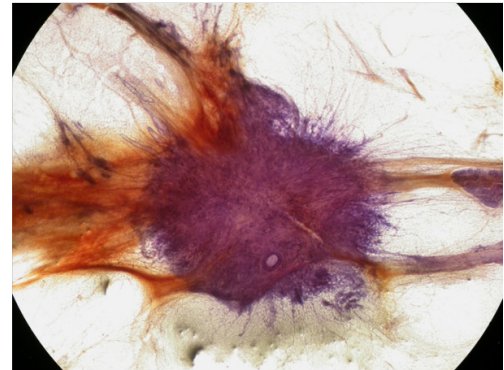
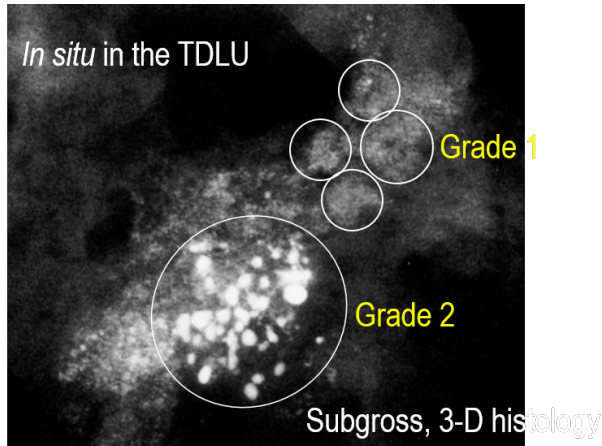
We use a classification system which is based on the apparent **anatomic site of origin** of breast cancer since the **long-term patient outcome appears to be largely determined by the site of origin of breast cancer.**



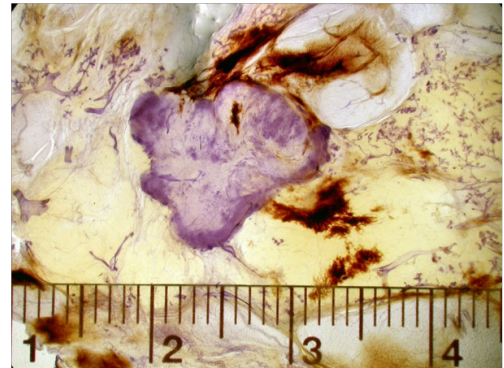
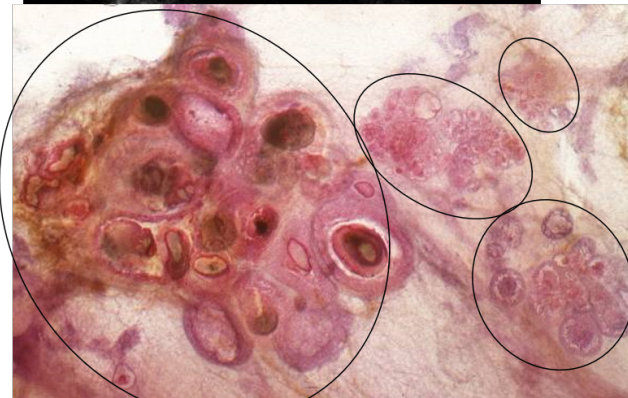
with no associated calcifications on the mammogram. Women 40-69 yrs old, diagnosed in Dalarna county, Sweden between 1977-2006



**Day 1** Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

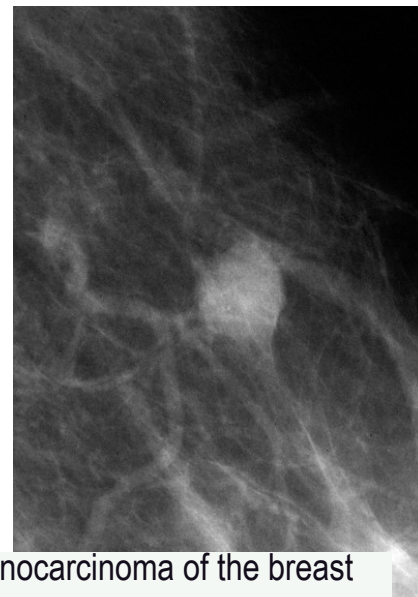
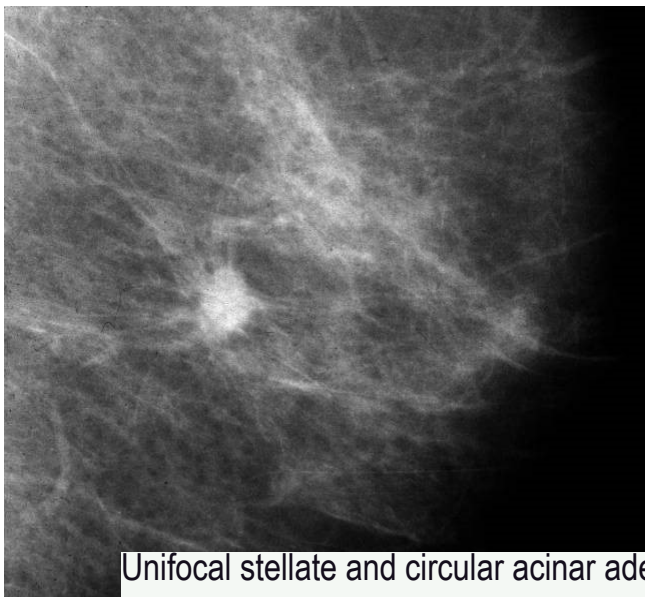


Invasive



(AAR)

Grade 1 and 2 carcinoma *in situ* in the TDLUs, not DCIS. The subsequent invasive carcinoma is either a stellate or circular tumor mass (not invasive "ductal" carcinoma), well demonstrable on the mammogram.

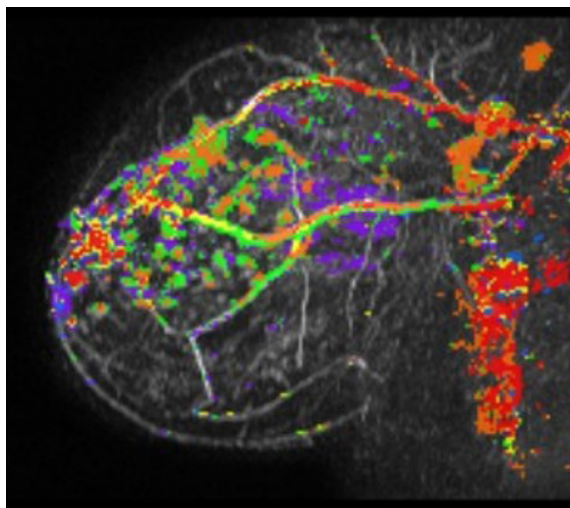
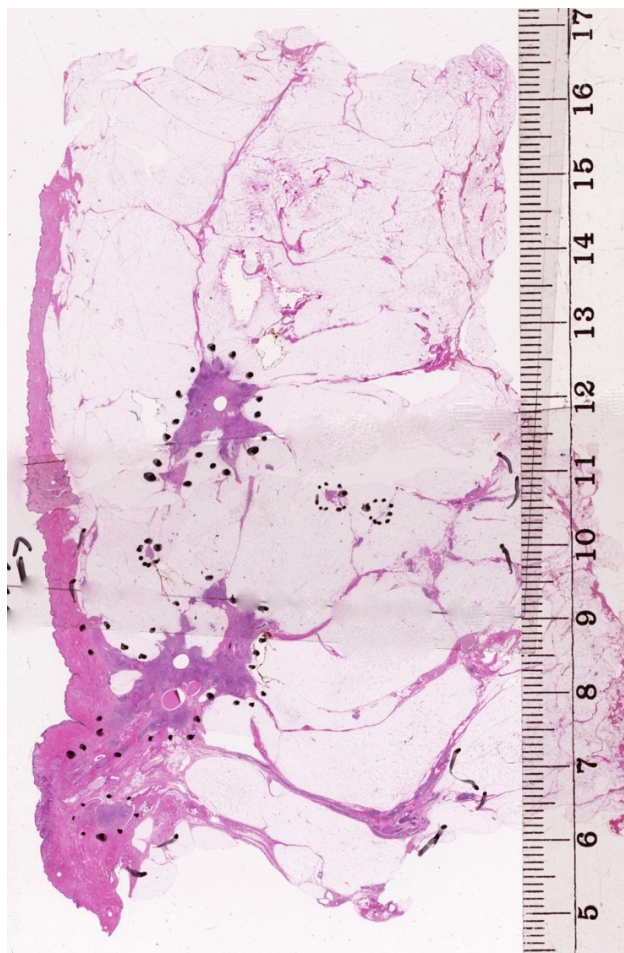
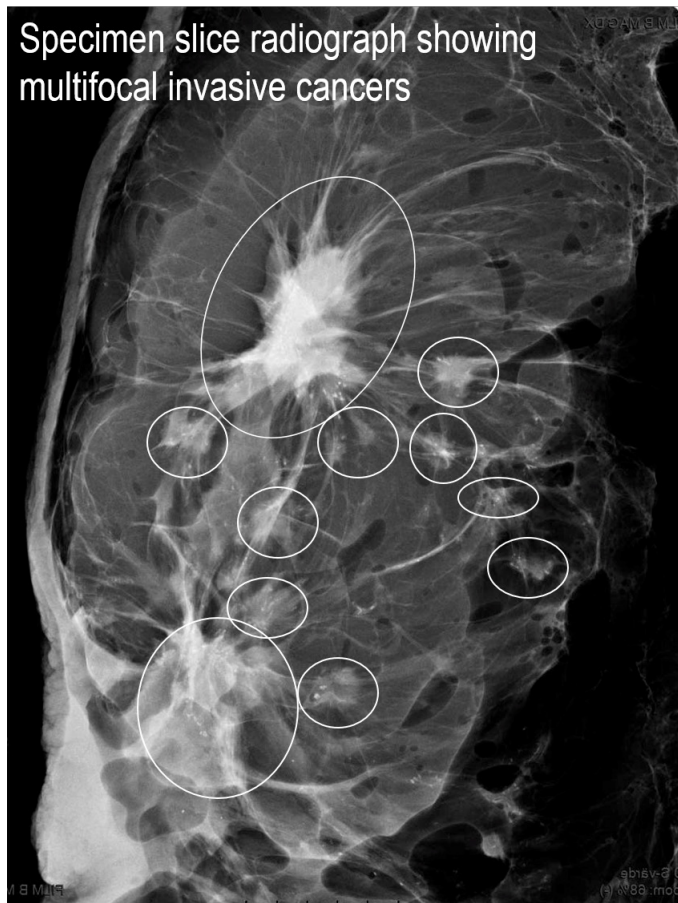


Unifocal stellate and circular acinar adenocarcinoma of the breast

**Day 1** Morning lectures between 8:30 AM - 12:00 PM. Breaks: 10:00 AM, 11:00 AM

Multifocal acinar adenocarcinoma of the breast

Specimen slice radiograph showing  
multifocal invasive cancers



12:00 PM - 1:00 PM Lunch



2020

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

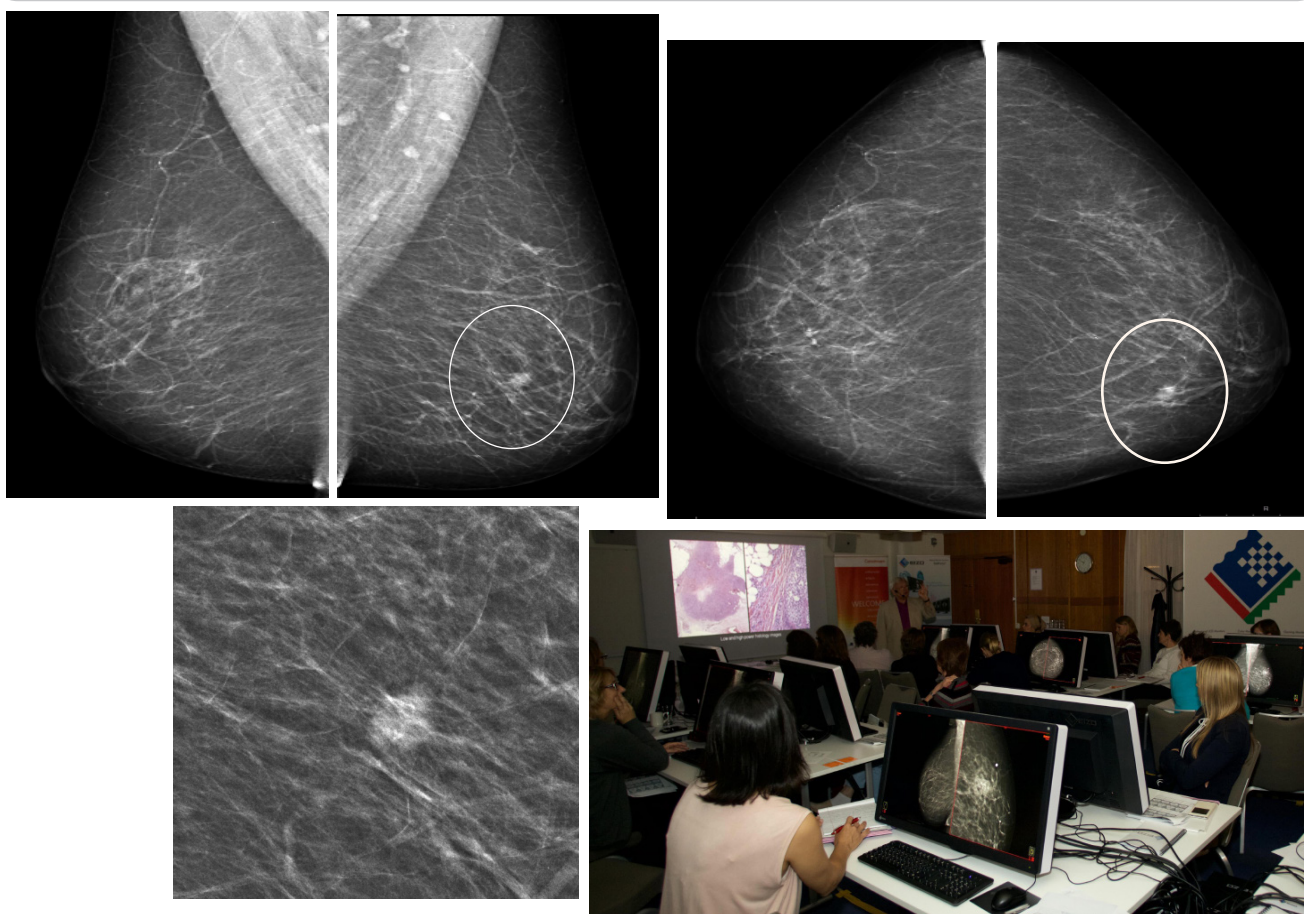
László Tabár, MD, FACR (Hon)  
and  
Mats Ingvarsson, MD

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

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

**Break: 2:15 - 2:30 PM**

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



**Break: 3:30 - 3:45 PM**

Hands-on training in screening

**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



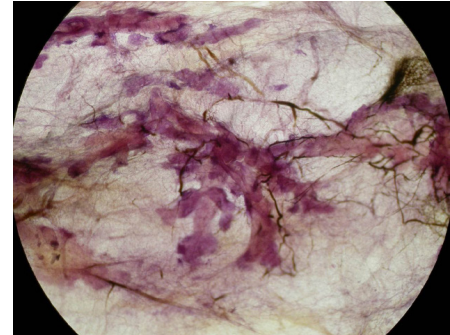
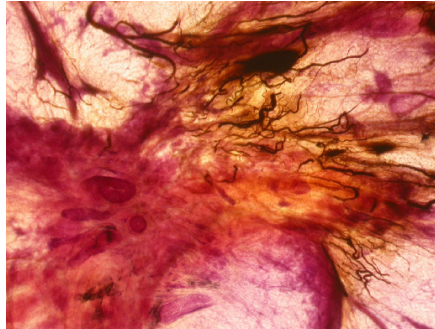
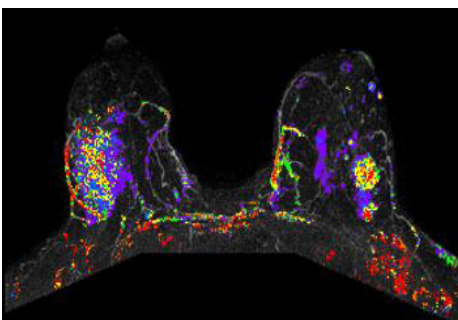
2020

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

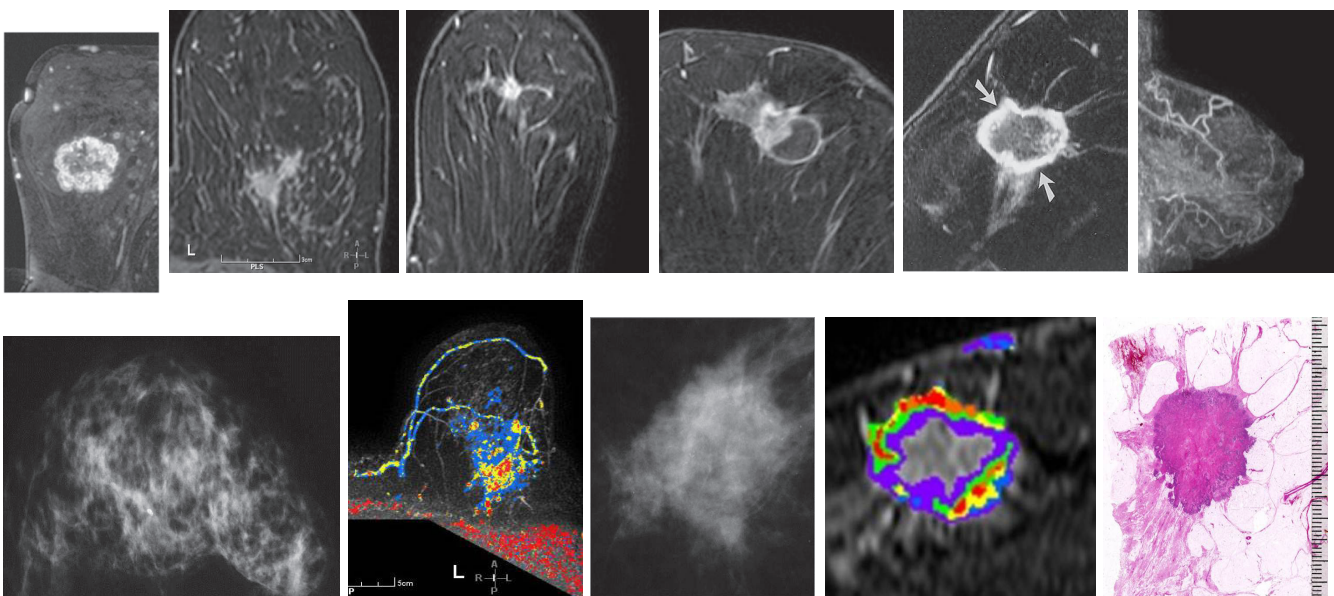
László Tabár, MD, FACR (Hon)  
and  
Mats Ingvarsson, MD

## 1st day Afternoon program - 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 Philips for providing the viewing stations and the engineering expertise at this teaching seminar.



2020

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

**2<sup>nd</sup> DAY AM** Hands-on screening and didactic lecture series 8:00 AM - 12:00 PM

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

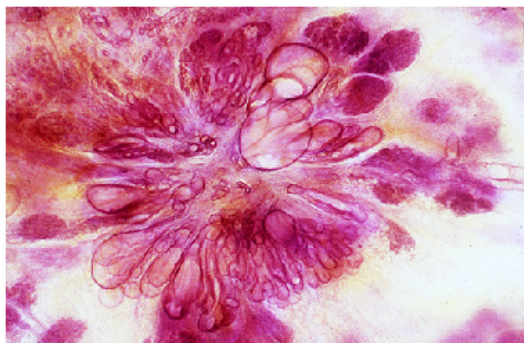
**9:15 - 9:30 and 10:30 - 10:45 AM** Breaks

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

**10:45 AM** **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



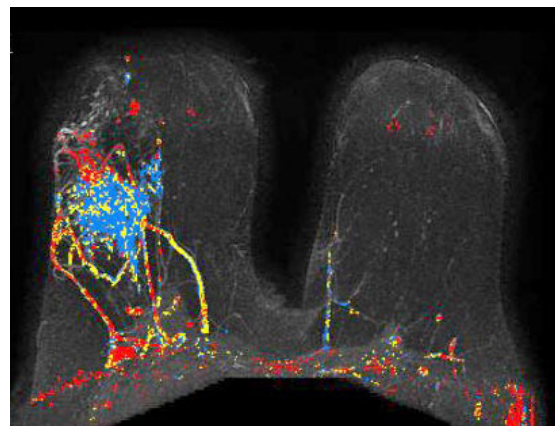
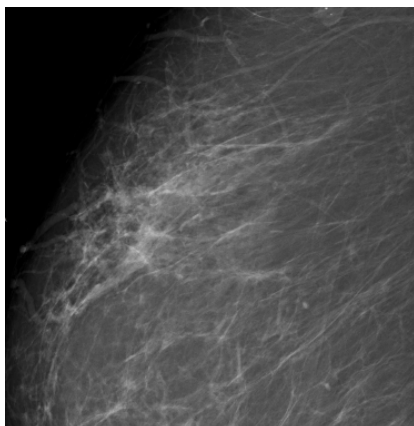
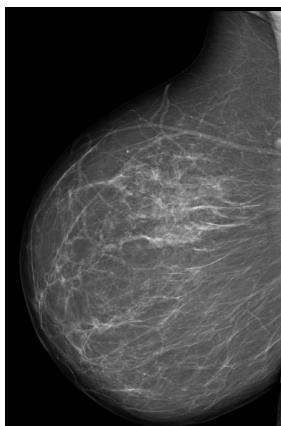
Radial scar



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**



**Lunch 12:00 PM-1:00 PM**

Non-calcified architectural distortion: extensive duct forming invasive cancer



2020

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

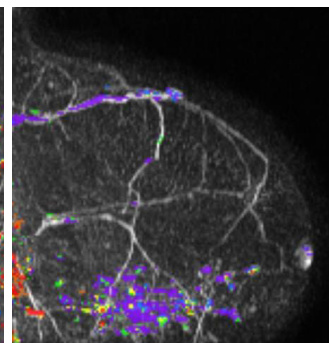
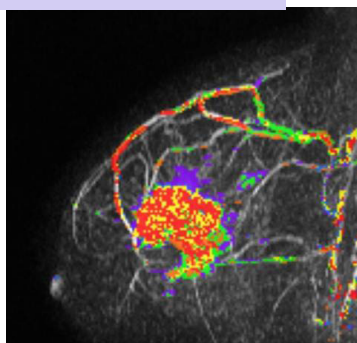
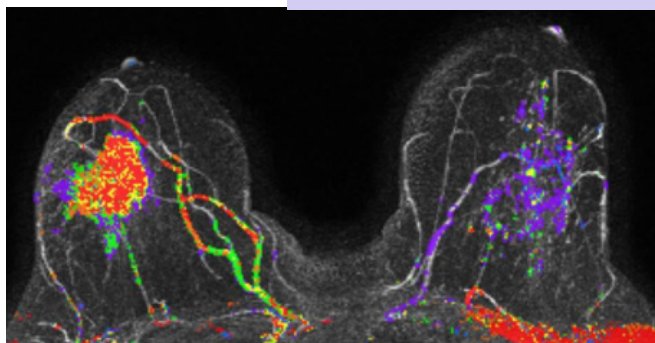
## 2nd day afternoon

Mammography and MRI Interpretation sessions at workstations  
between 1:00 PM - 5:00 PM

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



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



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



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

5:00 End of Day 2



2020

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

**3<sup>rd</sup> DAY AM** Hands-on screening and didactic lecture series 8:00 AM - 12:00 PM

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

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

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

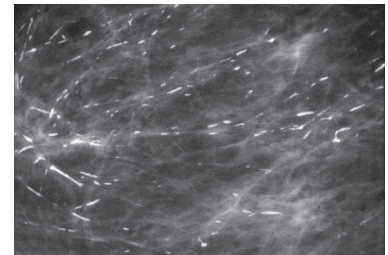
**10:30** ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

See pages X and XI.

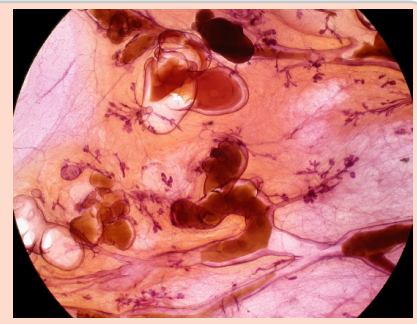
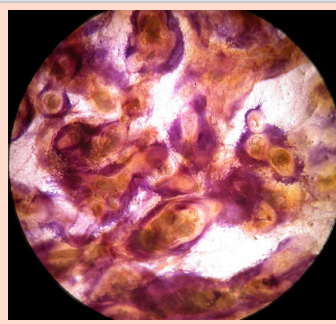
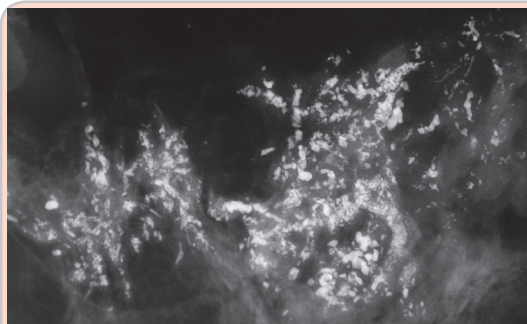
Benign plasma cell mastitis type calcifications in major ducts

BREAST DISEASES ORIGINATING IN THE MAJOR DUCTS

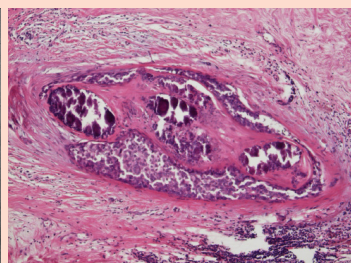
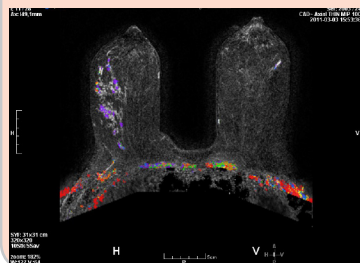
- **Benign type calcifications** originating in the major ducts
  - a) Secretory disease type calcifications
- **Malignant type calcifications** originating in the major ducts:



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



a) Fragmented casting type calcifications. **Example 1.**



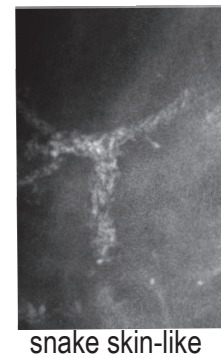
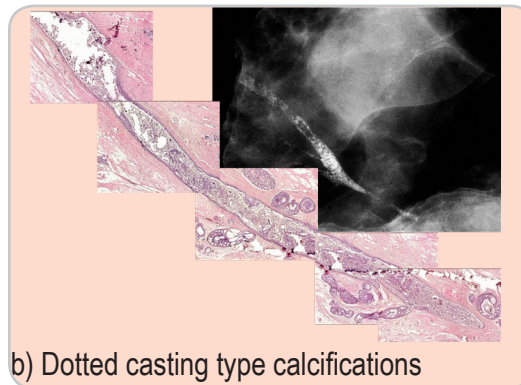
**Example 2.**

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

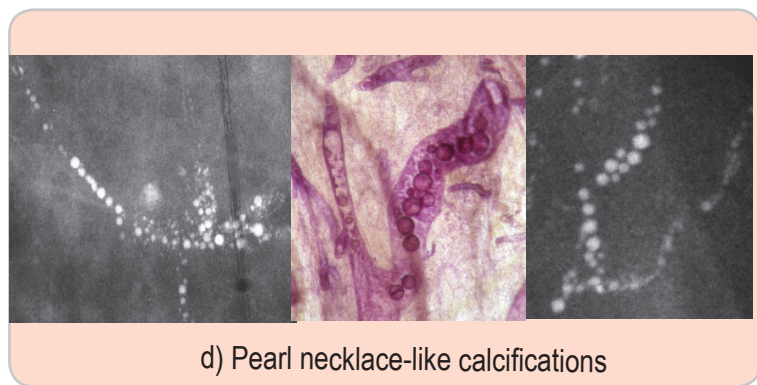
### 3rd DAY cont ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

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.



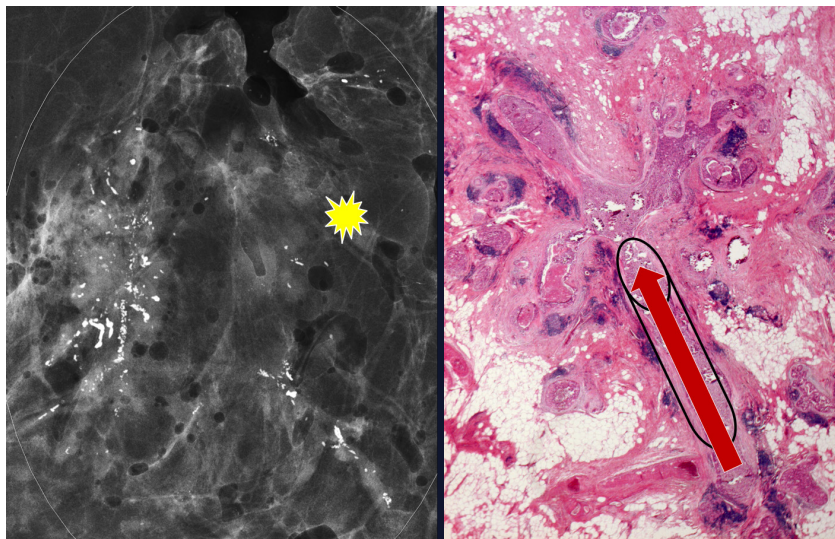
- \* The concept of **neoductgenesis**. Long-term follow-up results. New aspects, correct terminology.
- \* The role of breast MRI examination in demonstrating the extent of Gr 3 *in situ* carcinoma. - M Ingvarsson
- \* Mammographic /3D histologic correlation helping to explain the underlying pathophysiology and outcome.



Practice of calcification analysis. Faculty-audience interaction.

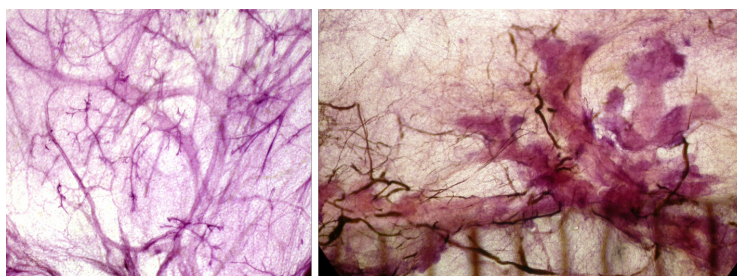
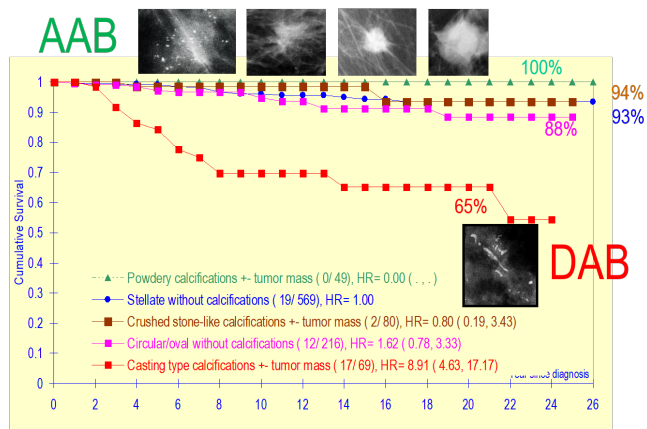
**Day 3** Morning lectures between *cont.* Breaks: 10:00 AM, 11:00 AM

Diffuse breast cancer originating from the major lactiferous ducts (DAB) (duct forming invasive carcinoma, not "DCIS")



**Mammographic-histologic correlation:** 60x30 mm Gr 3 duct forming invasive cancer (DAB) and a 6x3 mm poorly differentiated AAB.

Cumulative survival of women aged 40-69 years with 1-14 mm invasive breast cancers by mammographic tumor features. Dalarna county, Sweden.



Lunch 12:00 PM-1:00 PM



2020

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

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

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

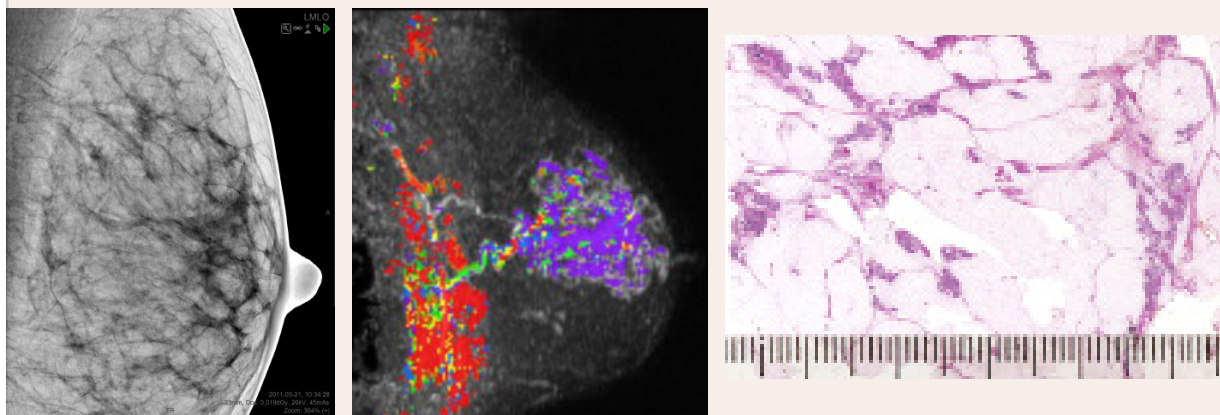


**2:30 - 3:30 PM HANDS ON SCREENING WITH MAMMOGRAPHY. SESSION 5.**

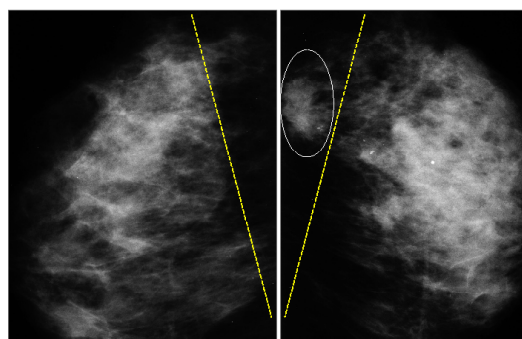
**4:00 -5:00 PM DISCUSSION OF THE SCREENING CASES FROM SESSION 5**

**3rd DAY PM** MRI interpretation and hands-on screening

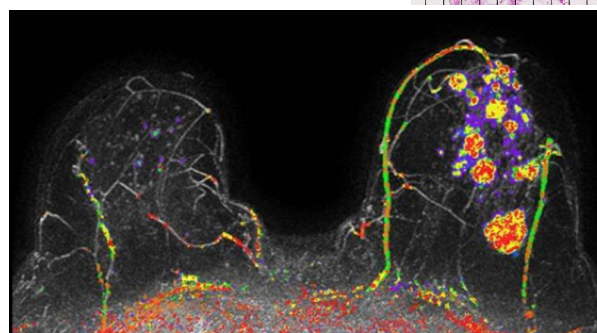
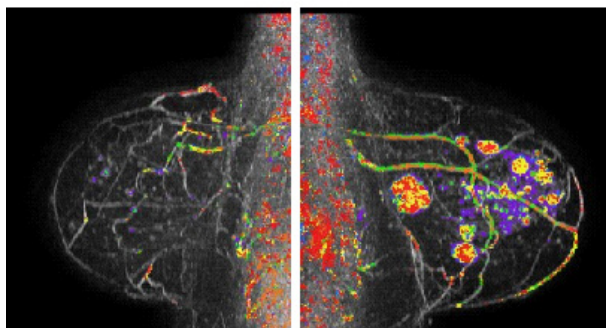
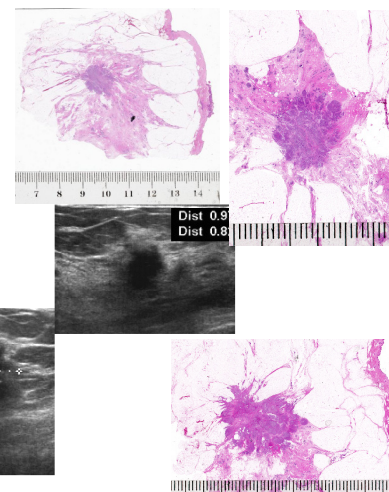
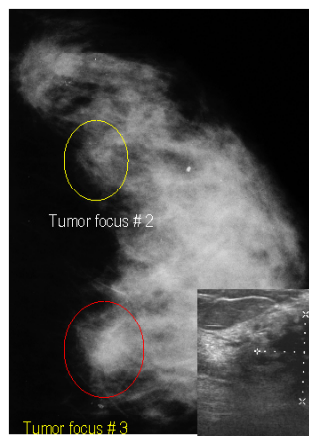
**Cases supporting the MRI workshop**



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



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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

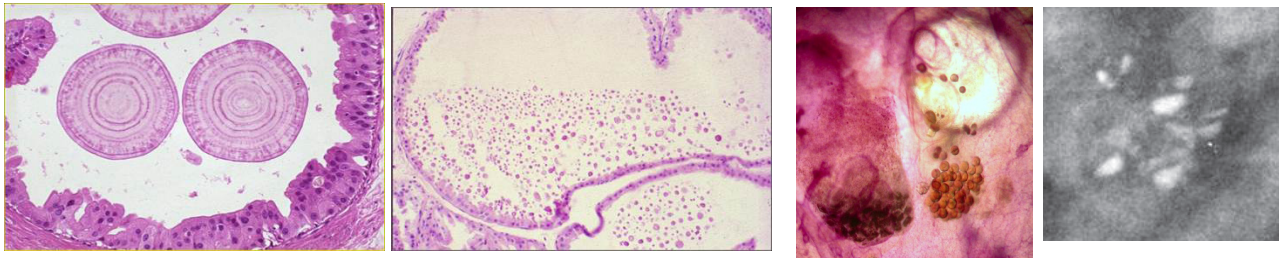
**4th day** Morning program between **8:00 AM - 12:00 PM** Breaks at 9:15 and at 10:00 AM

**8:00 - 9:00 AM** 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 cancers) c) calcifications localized within the major ducts and TDLUS. d) 1-14 mm unifocal and multifocal stellate and circular tumors.

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

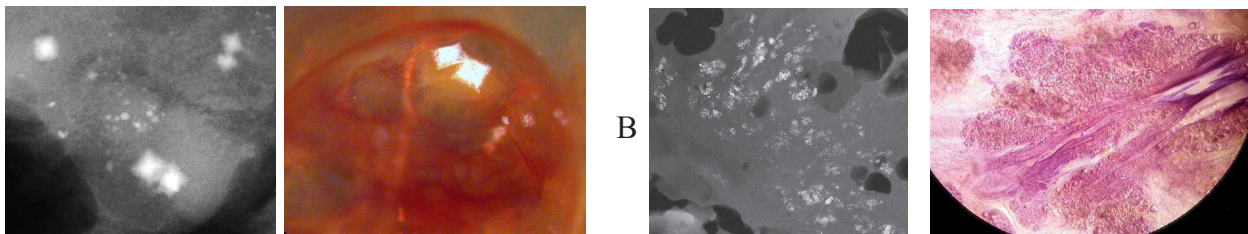
**10:15** ALGORITHM FOR CLASSIFYING BREAST DISEASES ACCORDING TO THEIR SITE OF ORIGIN

- 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 PM** Lunch



2020

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

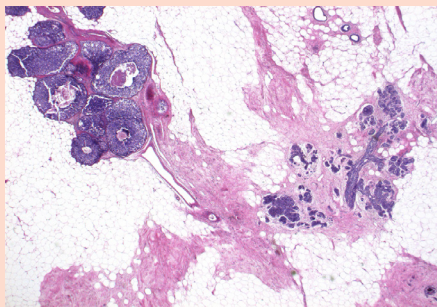
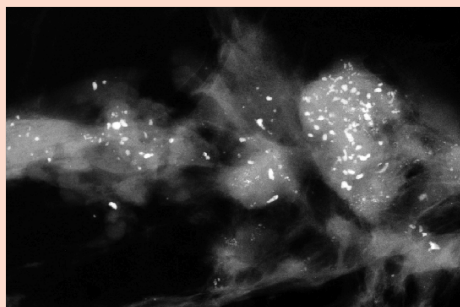
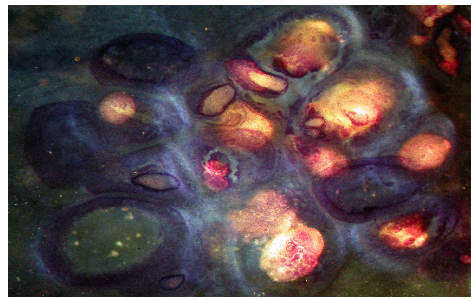
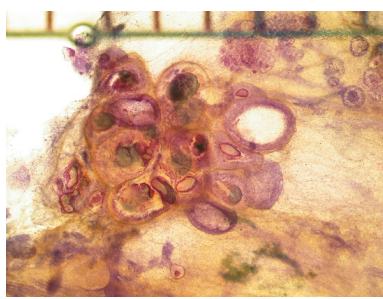
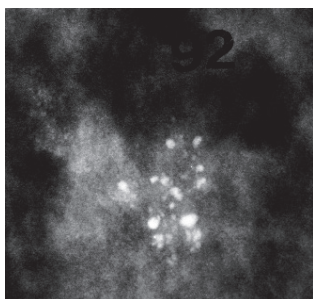
László Tabár, MD, FACR (Hon)  
and  
Mats Ingvarsson, MD

4th day

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

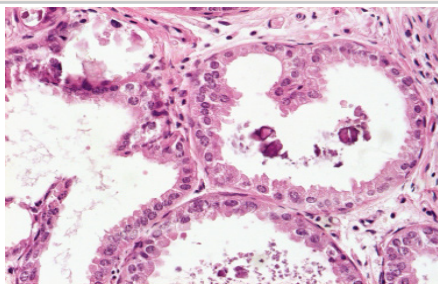
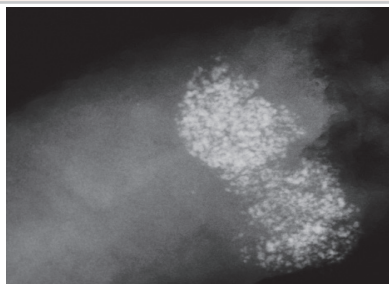
1:00 PM THE DIDACTIC LECTURE SERIES WILL COVER THE FOLLOWING TOPICS:

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



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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

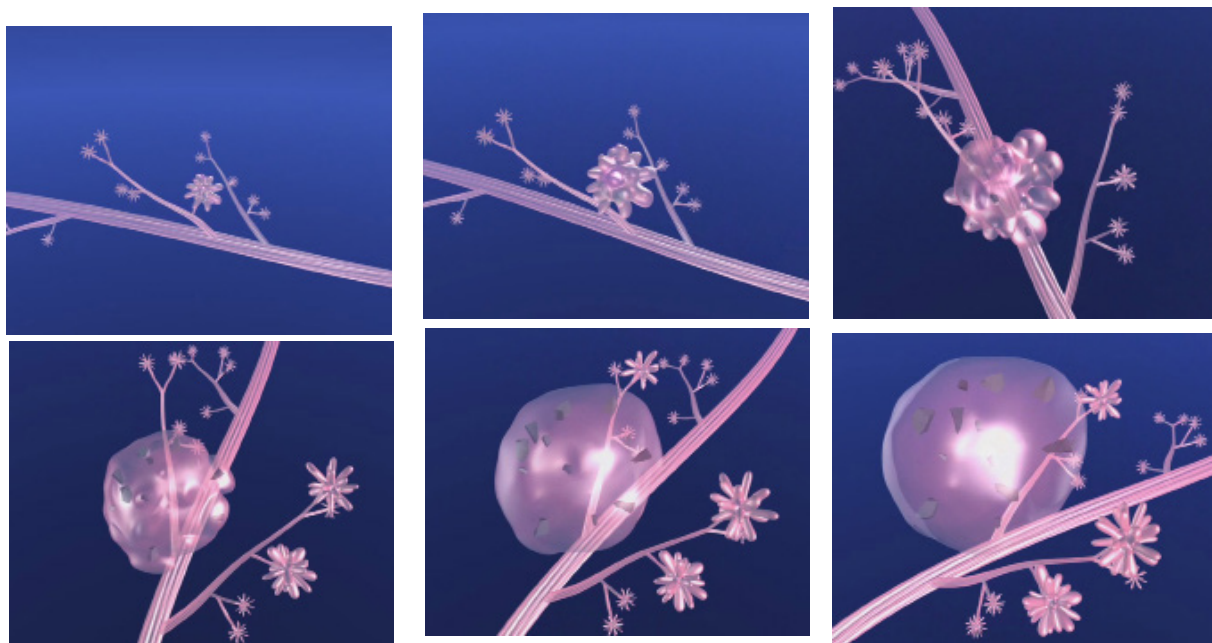
For more information and registration please contact:

**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](mailto:info@mammographyed.com)

Internet: [www.mammographyed.com](http://www.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**.



2020

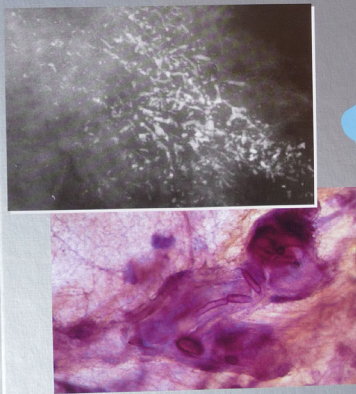
Hands-on screening course combined with  
Multimodality Diagnosis of Breast Diseases with  
Emphasis on Breast MRI

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

## Breast Cancer Early Detection with Mammography

Casting Type Calcifications: Sign of  
a Subtype with Deceptive Features

László Tabár  
Tibor Tot  
Peter B. Dean

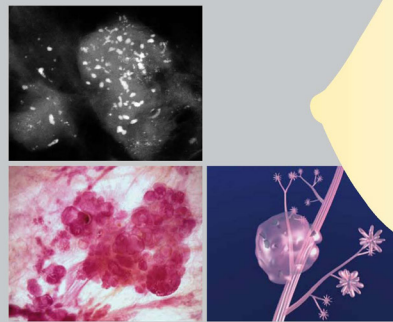


Thieme

## 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



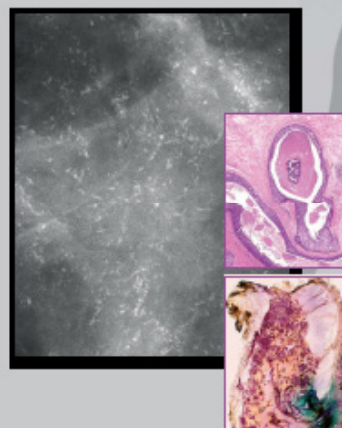
Immunohistochemistry,  
Immunofluorescence,  
Immunopathologic Correlation

Thieme

## Teaching Atlas of Mammography

László Tabár  
Peter B. Dean

With the contribution of Tibor Tot  
4th edition



Thieme

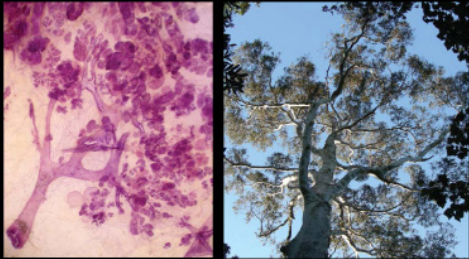


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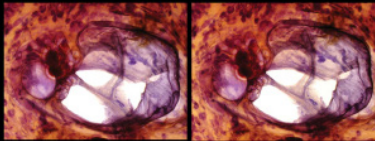
Hands-on screening course combined with  
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and  
Mats Ingvarsson, MD

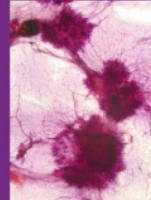
László Tabár, MD  
Tibor Tot, MD, Peter B. Dean, MD



## Understanding the Breast in Health and Disease



In 3D

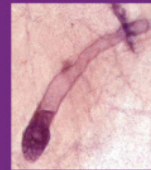


Multifocal breast cancer



Sea urchins

In 3D



In situ ductal carcinoma

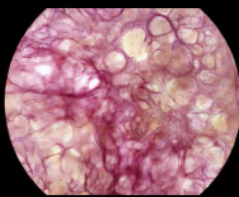


Banana flower

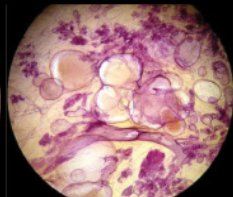
The basic structural elements of the female breasts are illustrated here in true 3-dimensional (3D) images and described in this Volume I by three breast cancer experts with decades of experience in the diagnosis of breast diseases. These images provide the best way to understand the great variability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

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

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Tibor Tot, MD, Peter B. Dean, MD,  
Miklós Tarján, MD



cysts in a prostate

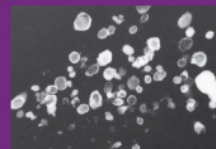


breast cysts

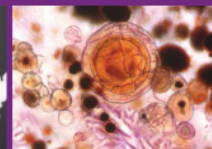
## Prostate and Breast: Brother and Sister Organs



In 3D



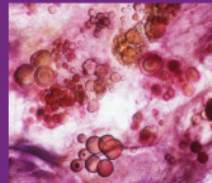
Prostate calcifications



Laminated calcifications  
in the prostate



In 3D



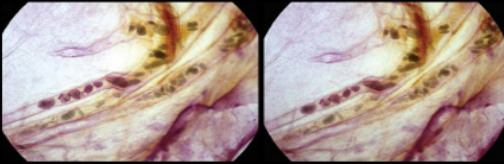
Laminated calcifications in  
the breast



Rowan berries

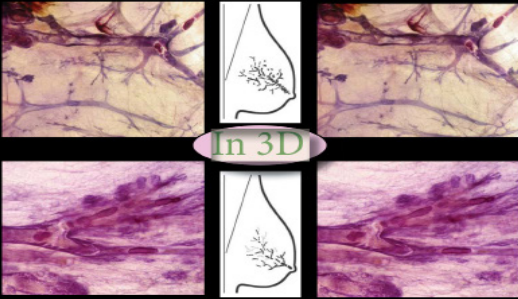
Even as the risk of getting prostate and breast cancer is rising, early detection through screening and treatment in an early stage are significantly lowering the risk of dying from these diseases. This series of 3D books aims to empower both men and women with knowledge about their health. Although 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.

*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



In 3D



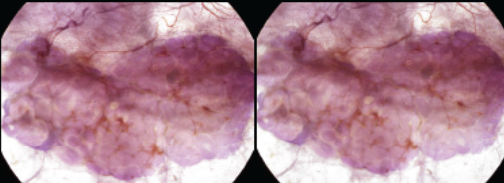
Fragmented casting type calcifications make the cancerous duct-like structures visible on the mammogram.



Neoductogenesis is a frequent phenomenon in the plant world

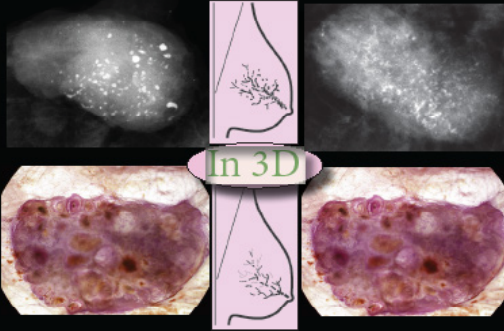
The mammogram is a true representation of the structural changes induced by the genetic constellation of each breast cancer subtype. The mammographic/MRI/ultrasound presentation of a particular subtype reflects the nature and extent of the underlying disease process, and when correctly interpreted, can 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.

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

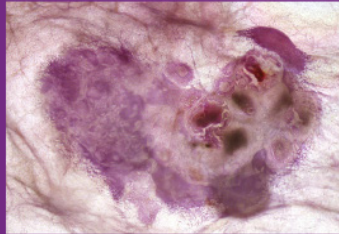


An axillary lymph node populated with metastases mimicking *in situ* cancer

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

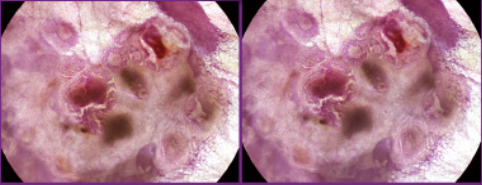


In 3D



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

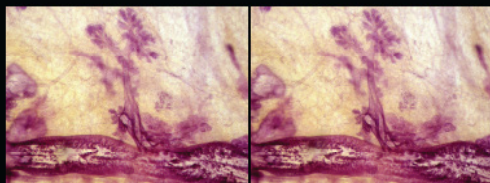
In 3D



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

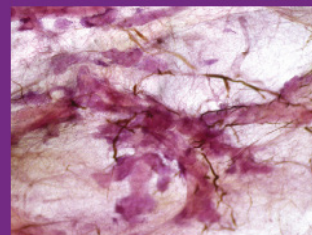
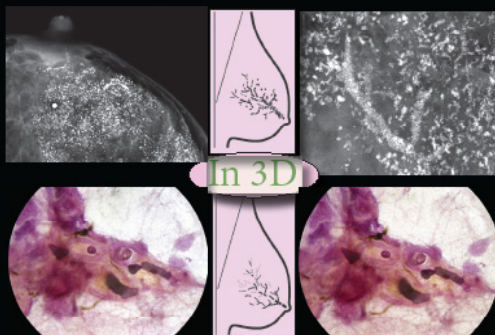
Breast cancers originating from the major milk ducts (breast cancer of ductal origin, DAB) occasionally cause axillary lymph node metastases which are similar in appearance at histology to DAB in the breast. Regardless of whether or not the myoepithelial cell layer is demonstrable, the decisive question 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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Tibor Tot, MD, Peter B. Dean, MD



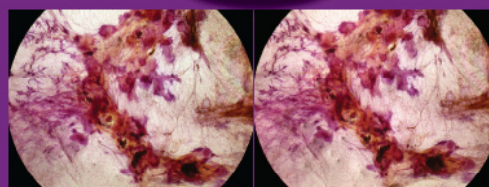
Micropapillary breast cancer of ductal origin associated with a normal TDLU

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



Neoductogenesis (DAB)  
associated with angiogenesis

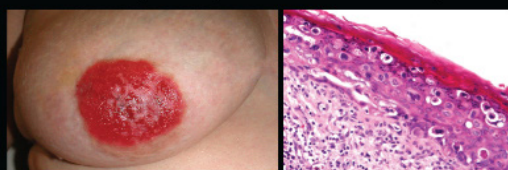
In 3D



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.

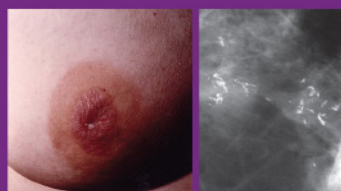
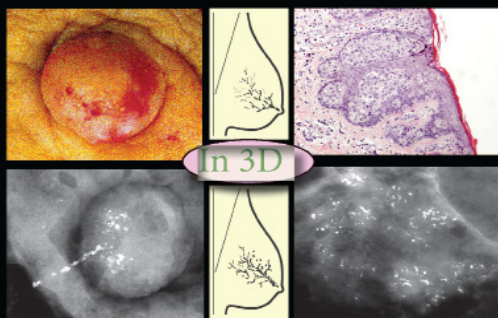
László Tabár, MD  
Tibor Tot, MD, Peter B. Dean, MD



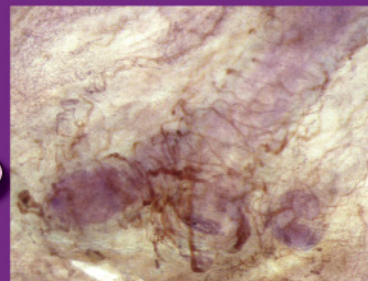
Paget's disease of the nipple

Paget's cells in the epidermis of the nipple

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



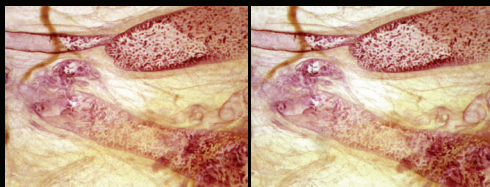
Paget's disease of the nipple and breast cancer of ductal origin



Cancer-filled duct in Paget's disease with angiogenesis

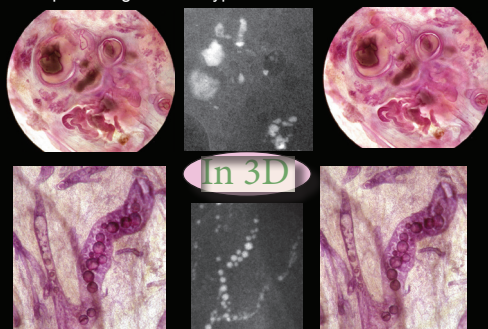
One of the features which is unique to breast cancers originating from the major ducts (DAB) is **Paget's disease of the breast**. It was first described by the British pathologist, James Paget in 1874. He described 14 cases of breast cancer associated with an eczema-like skin change of the nipple and 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.

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

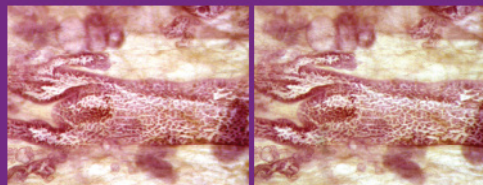


## Ductal Adenocarcinoma of the Breast (DAB), Part 5

Fluid producing DAB subtypes associated with calcifications



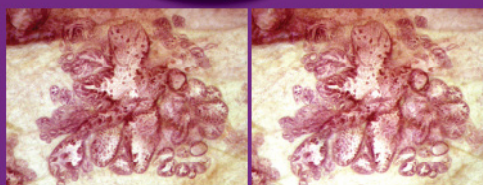
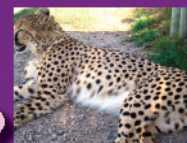
In 3D



Fluid producing micropapillary breast cancer of ductal origin (DAB)



In 3D



Neoductogenesis 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.

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

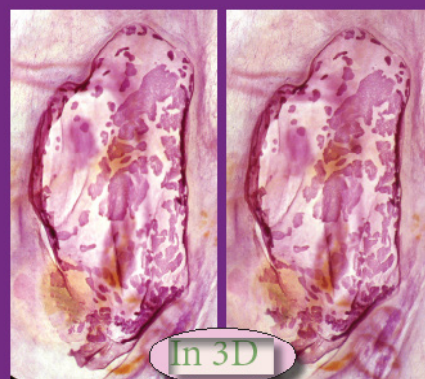


Bloody and serous nipple discharge

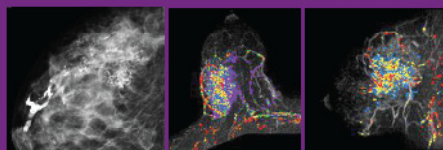
## Ductal Adenocarcinoma of the Breast (DAB), Part 6



In 3D



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).

László Tabár, MD

Tibor Tot, MD, Peter B. Dean, MD

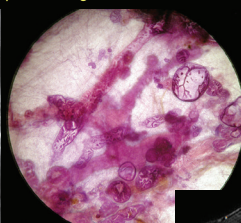
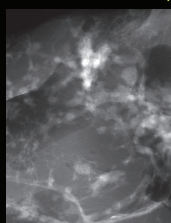


In 3D

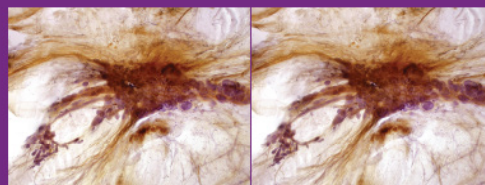
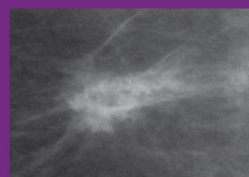
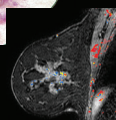
Breast cancer originating from the major ducts

## 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



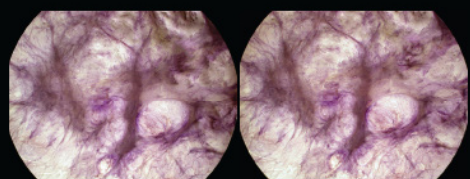
There are two main groups of diffuse breast cancers presenting on the mammo-  
gram as large regions of architectural distortion; these account for about 25%  
of all breast cancers and tend to have a poor outcome: 1) **Neoductgenesis**, i.e.  
"duct forming invasive carcinoma", the topic of this volume, 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 con-  
centration of abnormal, tumor-filled ducts results in an asymmetric density  
with architectural distortion on the mammogram and often causes a pal-  
pable "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.

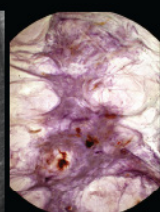
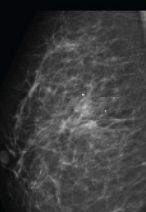
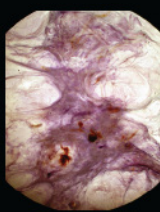
László Tabár, MD

Tibor Tot, MD, Peter B. Dean, MD

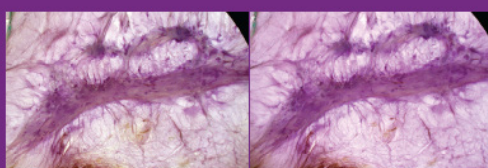
Olga Puchkova, MD



## Diffusely infiltrating breast cancer, Part 1



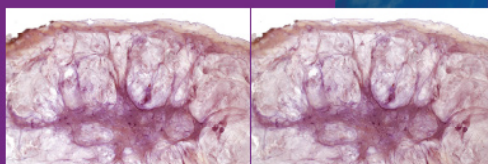
In 3D



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



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 mesenchy-  
mal 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.



2020

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. Tabár'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)

