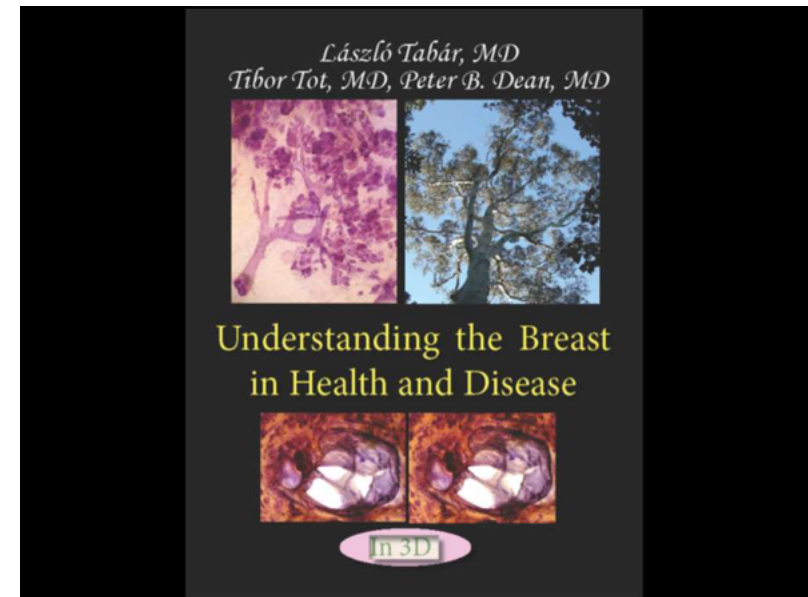




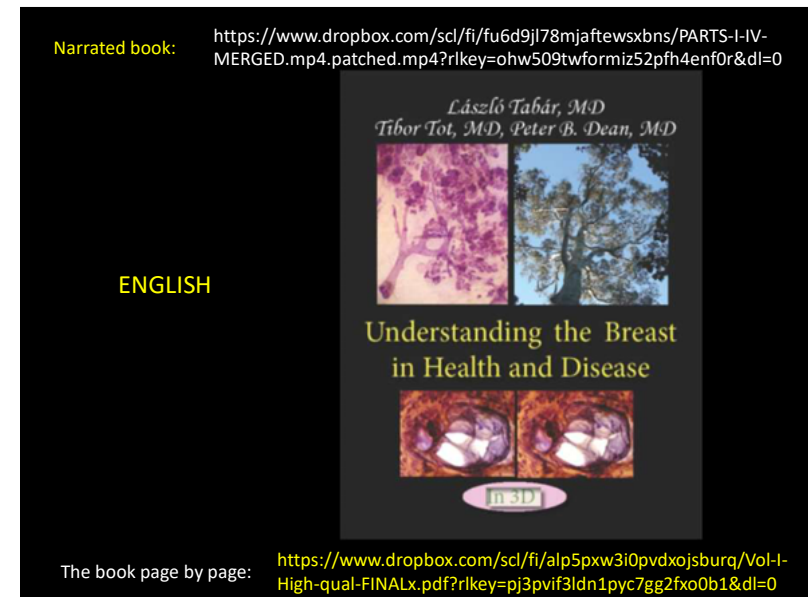
1



2



3



4

Narrated book in Spanish PARTs I – IV (see next slide)



The book in Spanish, page by page: <https://www.dropbox.com/scl/fi/aldjrsa2tck2co16mymkf/Vol-I-SPANISH.pdf?rlkey=5jb44xbi9215nm8ucl5yvvxqg&dl=0>

5

SPANISH

PART I

<https://www.dropbox.com/scl/fi/26dfw8fb0xr1hq2gk5fpt/3D-Spanish-Part-I.mp4.patched.mp4?rlkey=mzjvmu9qkctth3jiwuc85xyvgs&dl=0>

PART II

<https://www.dropbox.com/scl/fi/jo9iy8aroilrh43wwzdf/3D-Spanish-Part-II.mp4.patched.mp4?rlkey=9dn2oyzmbzk3q4tev79oj6hif&dl=0>

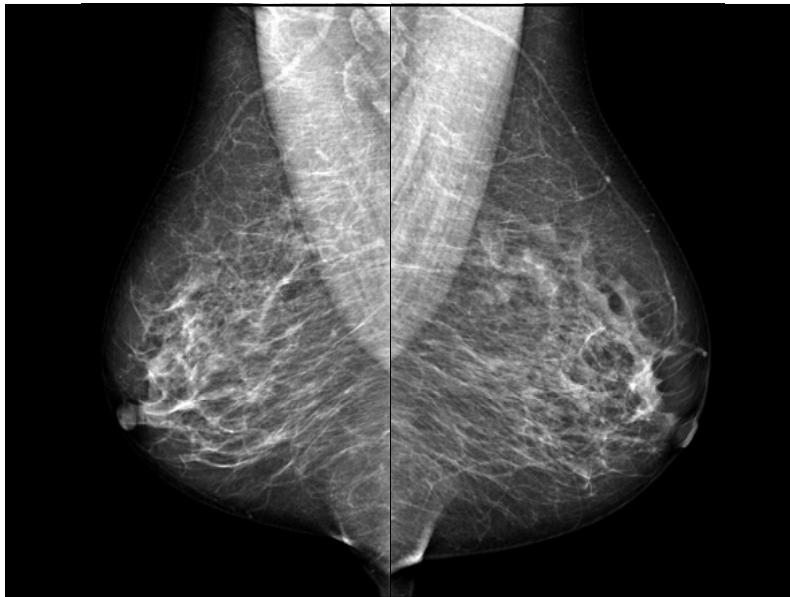
PART III

<https://www.dropbox.com/scl/fi/gt0gwj73xq2n5ltjpm6bk/3D-Spanish-Part-III.mp4.patched.mp4?rlkey=by30tw2tj9441453zku47i1st&dl=0>

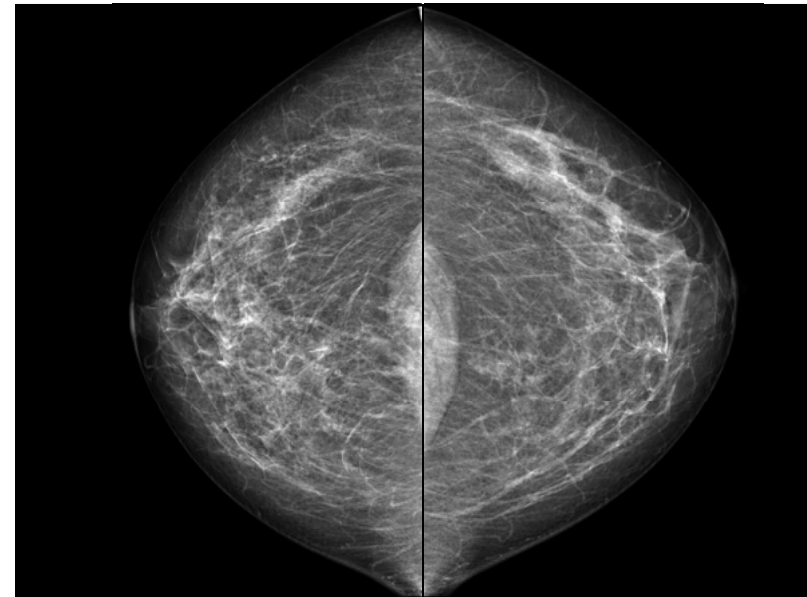
PART IV

<https://www.dropbox.com/scl/fi/o1s8jp050jn0l2jzgl9xi/3D-Spanish-Part-IV.mp4.patched.mp4?rlkey=tq5afmd769cexlp1td5vzp6vg&dl=0>

6



7



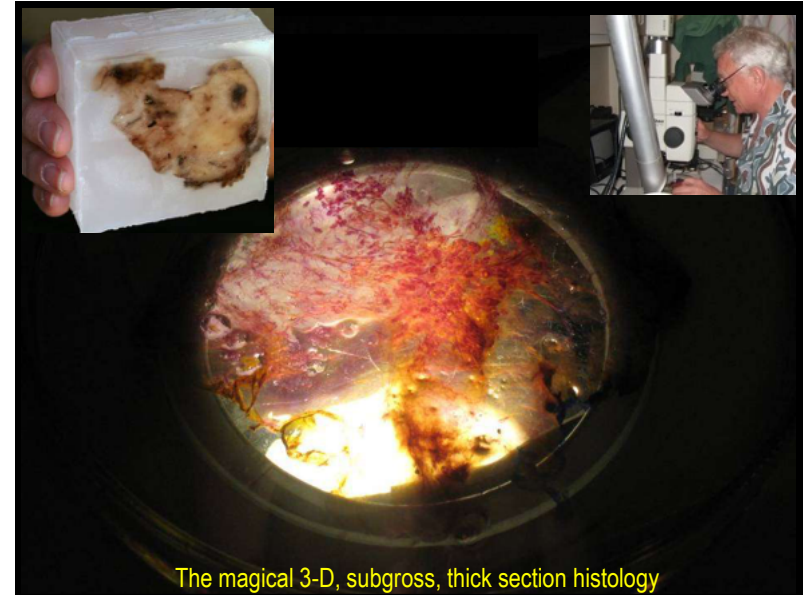
8

It is our firm belief that competence in breast image interpretation can be best achieved by correlating the large format 3D histopathology of the normal and abnormal breast tissue with

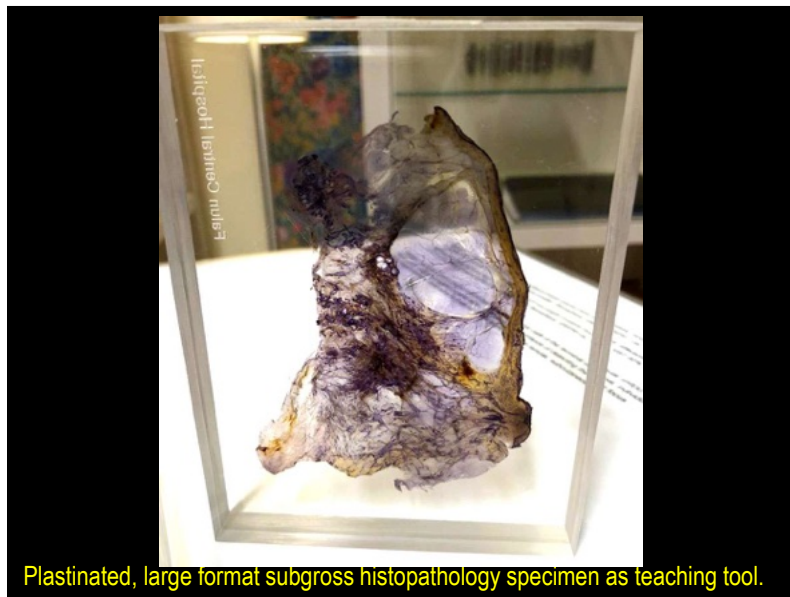
- Mammograms
- Ultrasound, MRI and
- Other imaging methods.



9



10



11



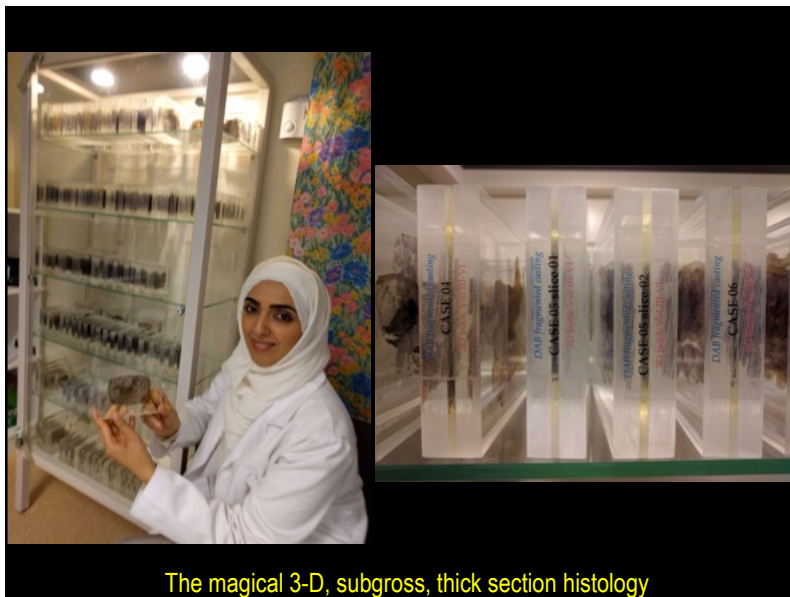
12



13



14



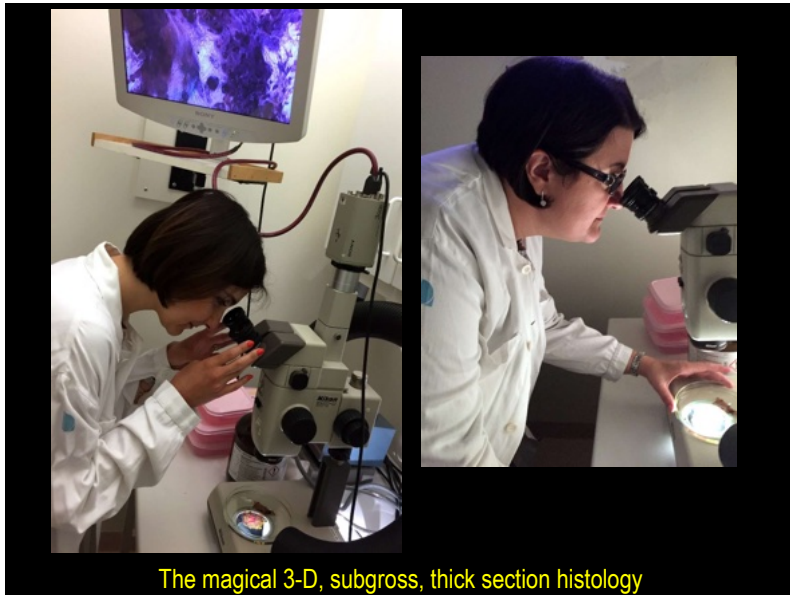
The magical 3-D, subgross, thick section histology

15



The magical 3-D, subgross, thick section histology

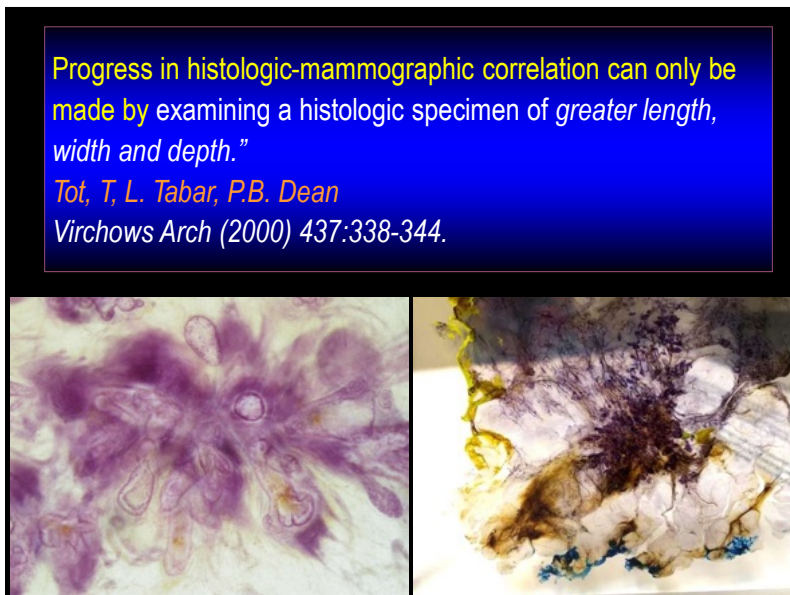
16



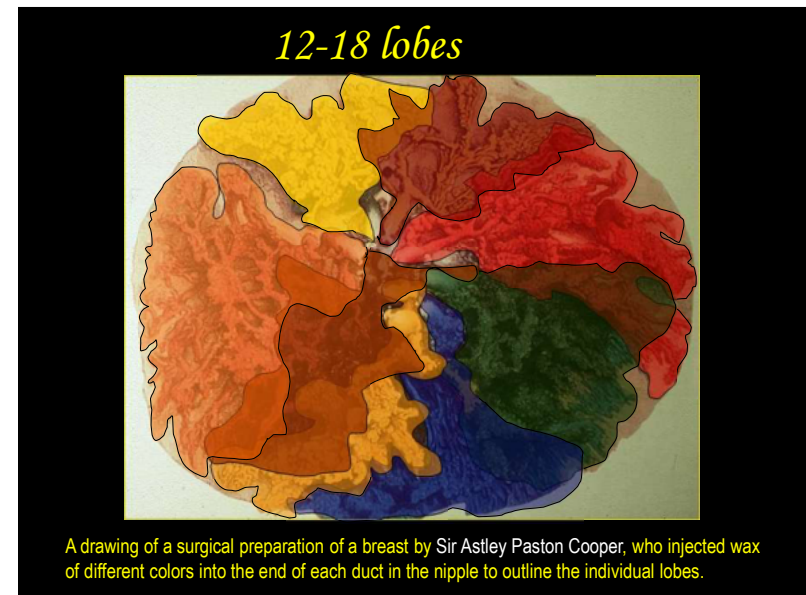
17



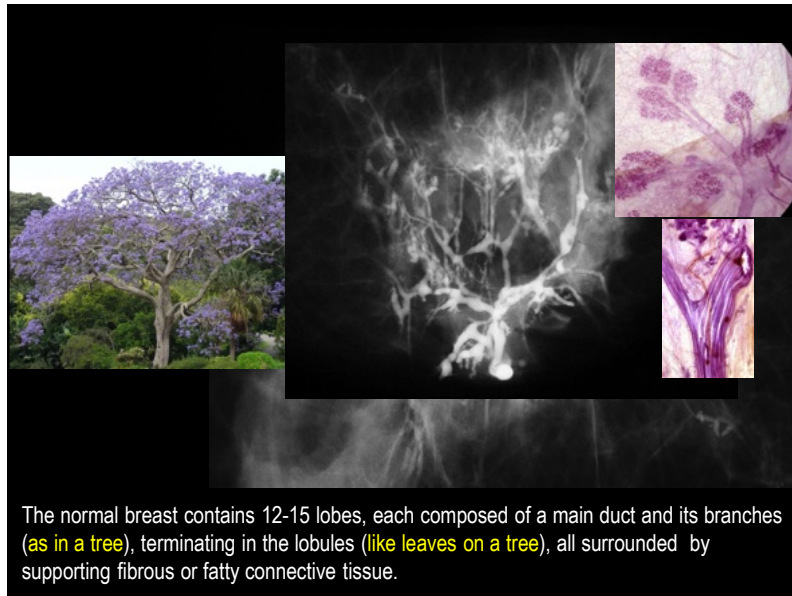
18



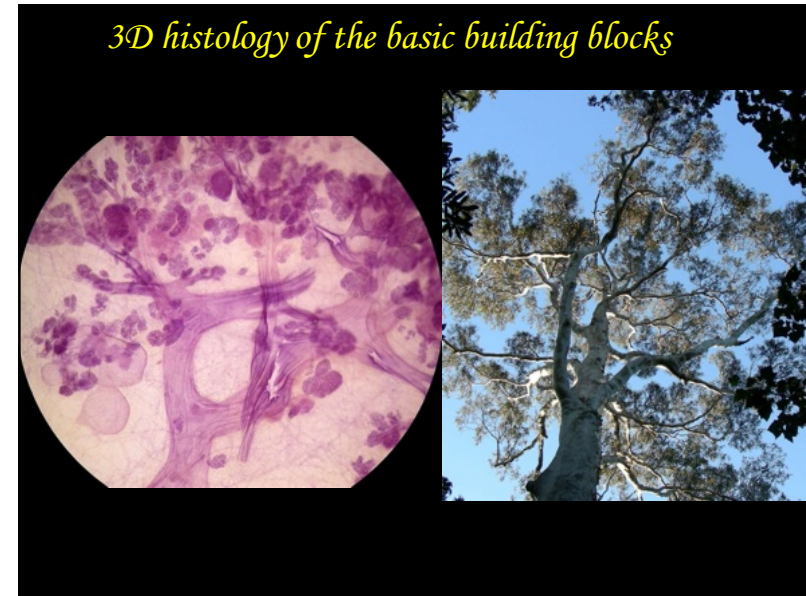
19



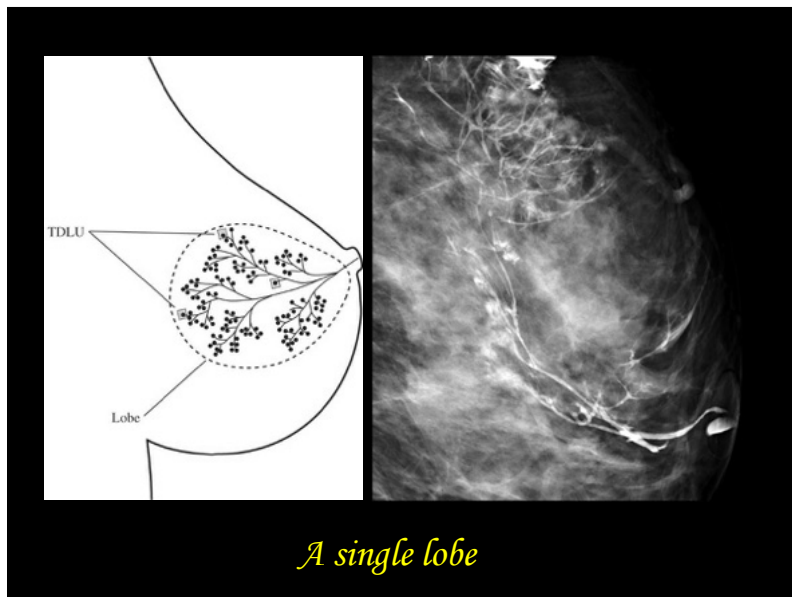
20



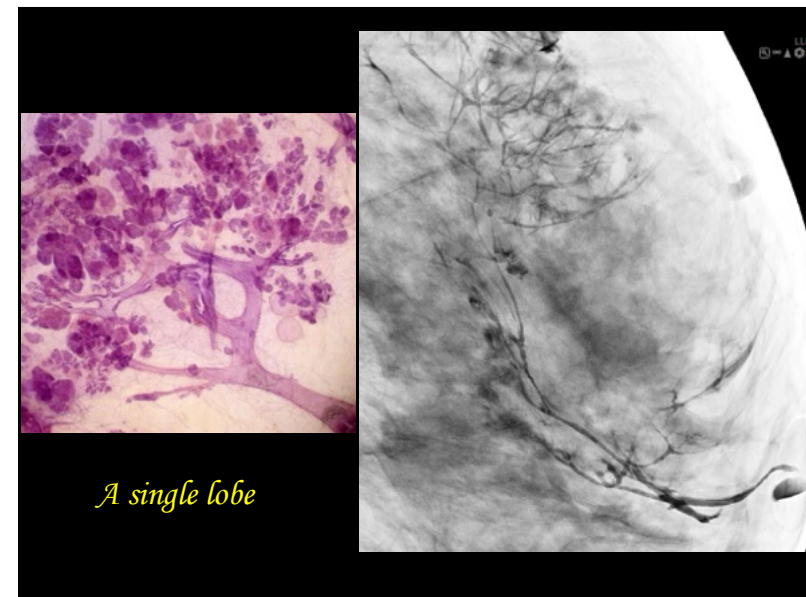
21



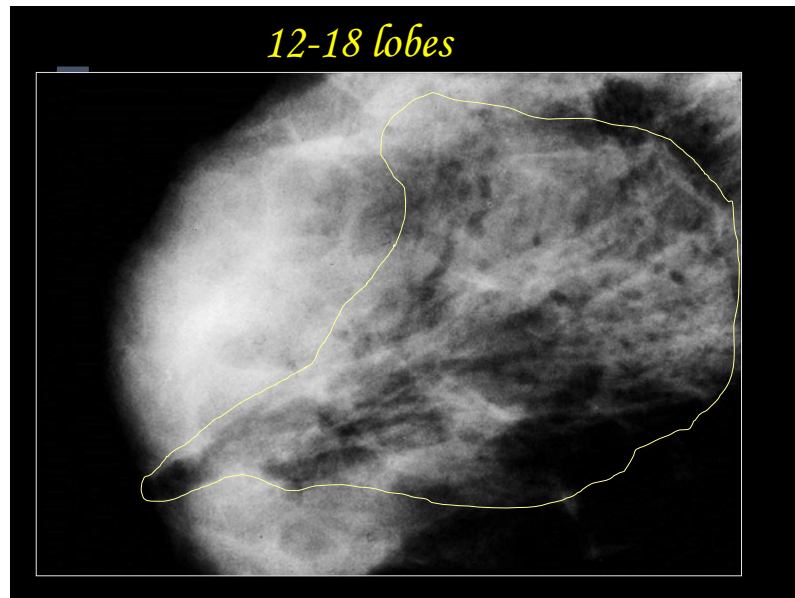
22



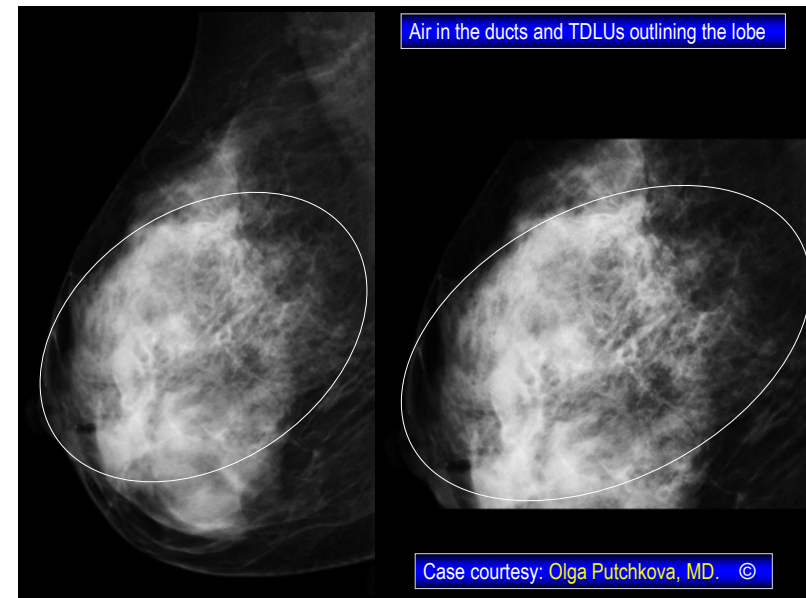
23



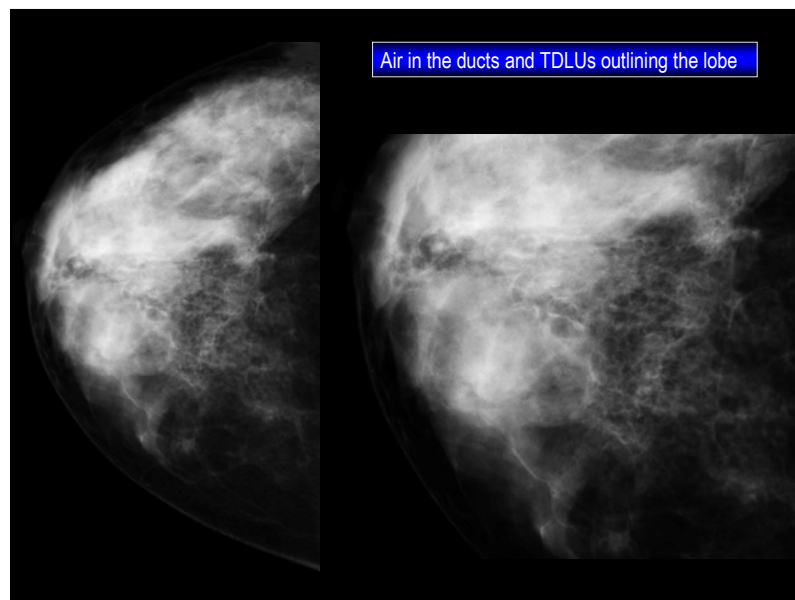
24



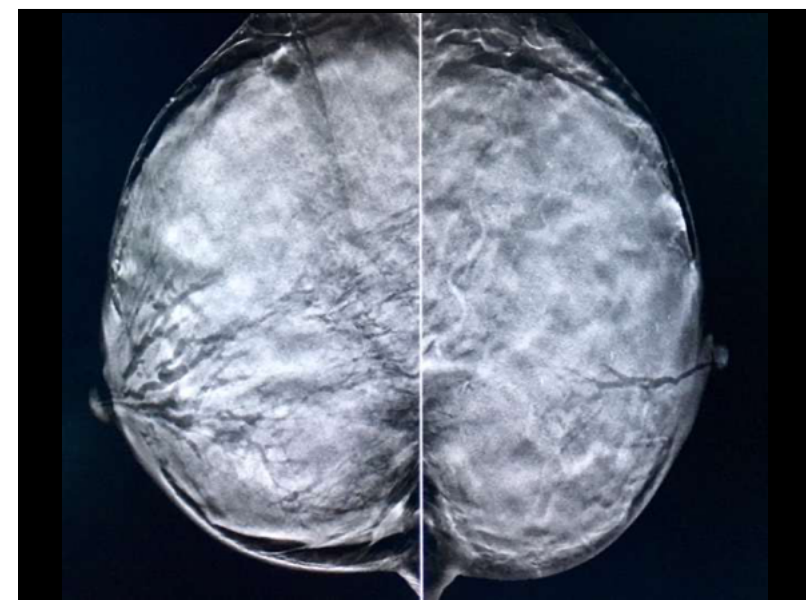
25



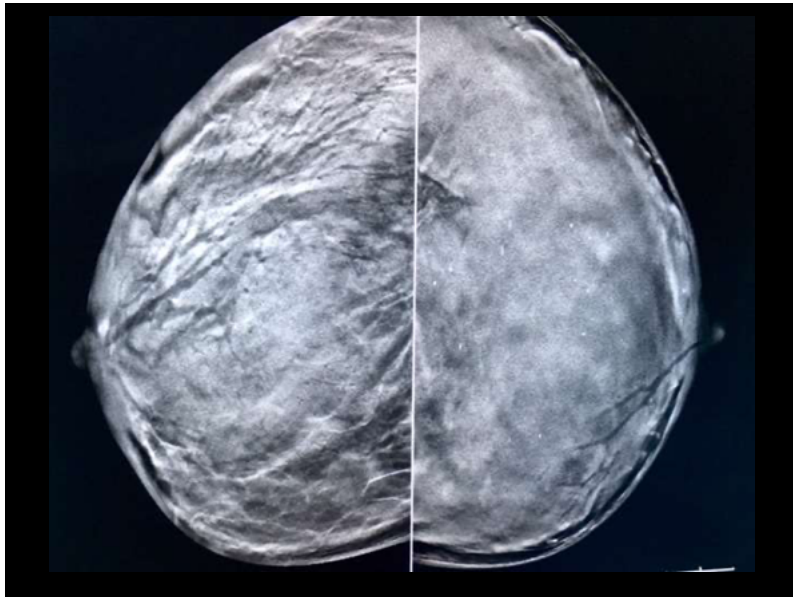
26



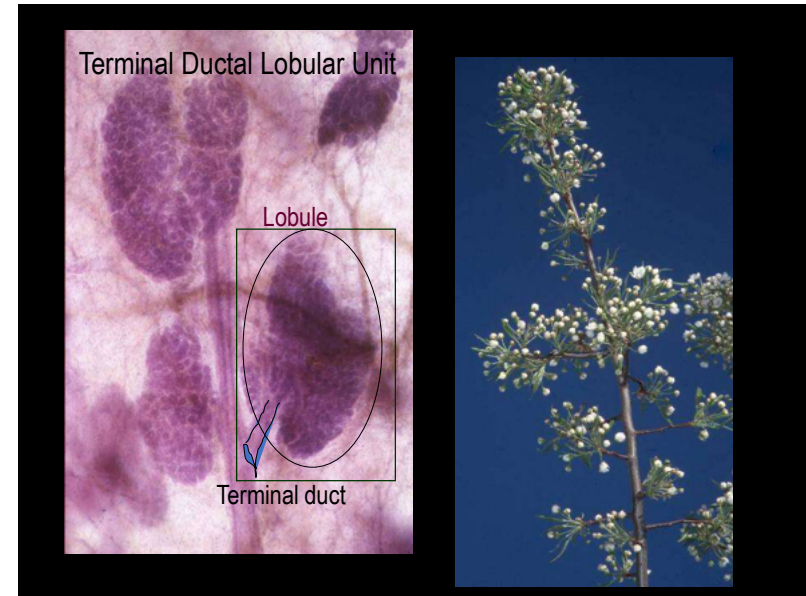
27



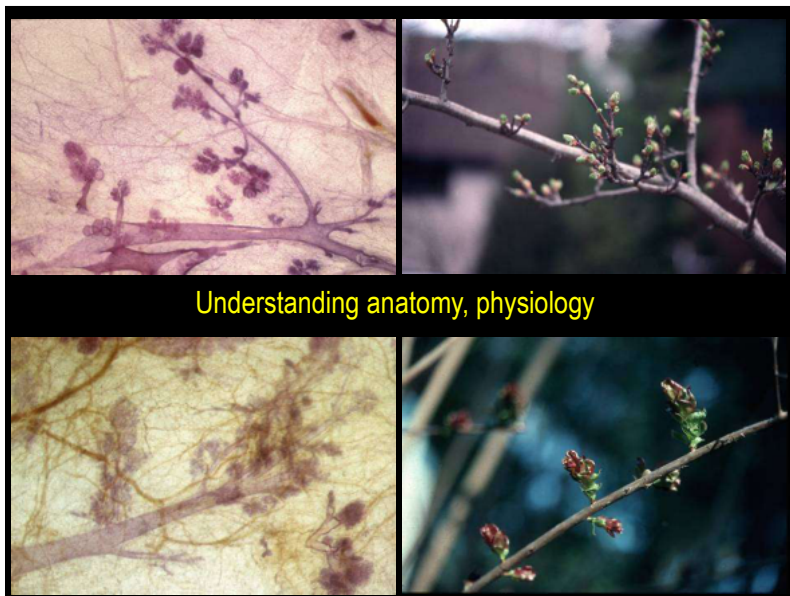
28



29

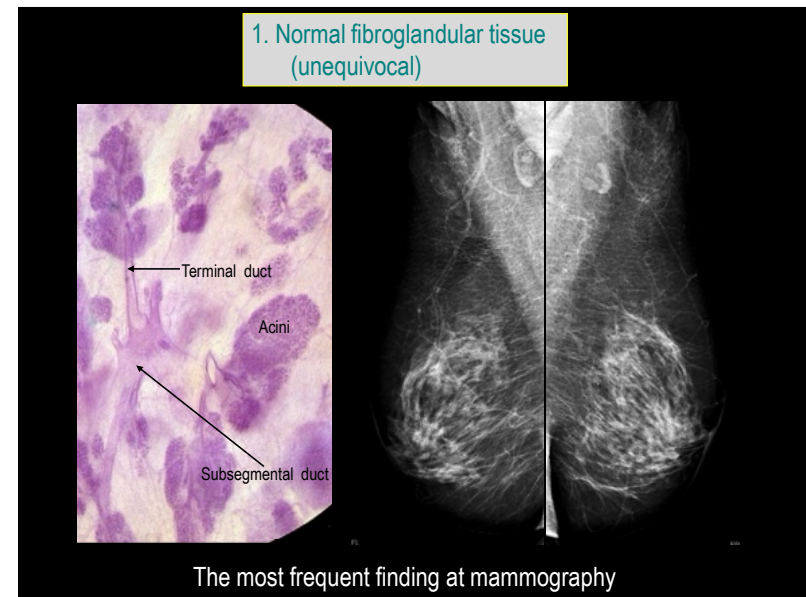


30

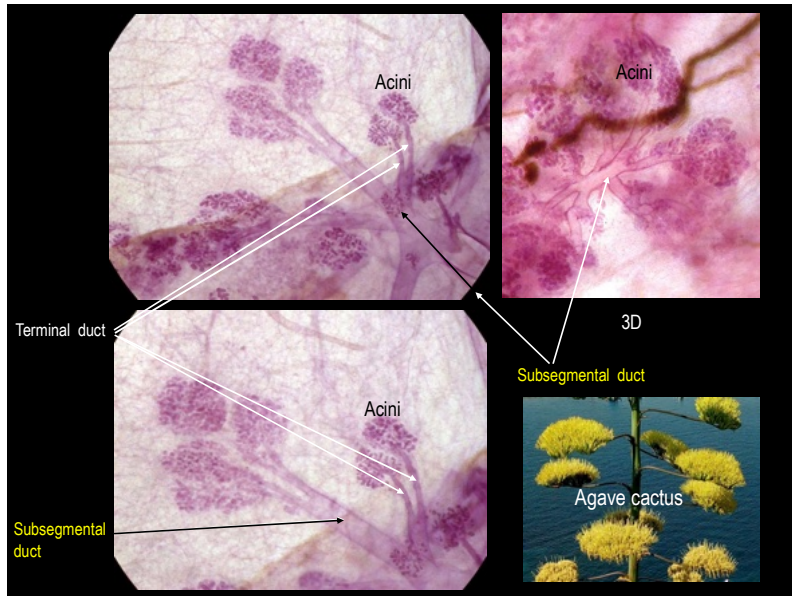


Understanding anatomy, physiology

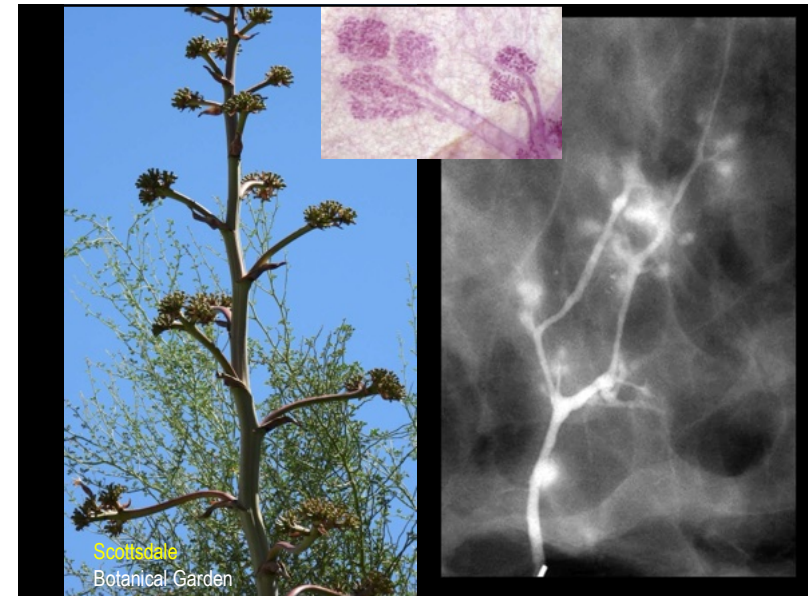
31



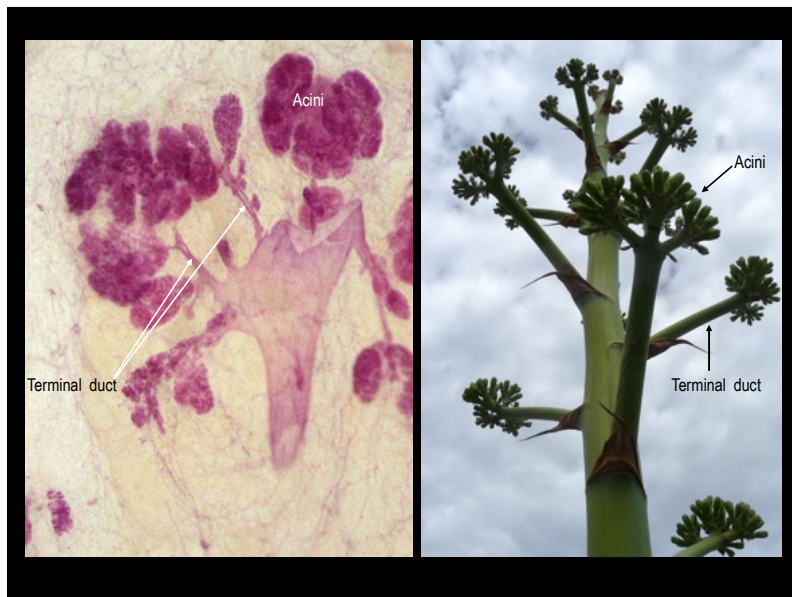
32



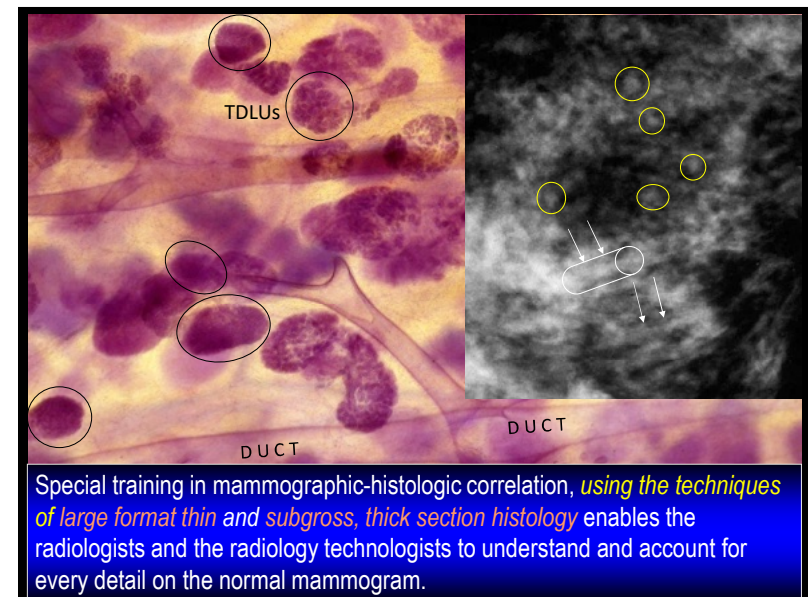
33



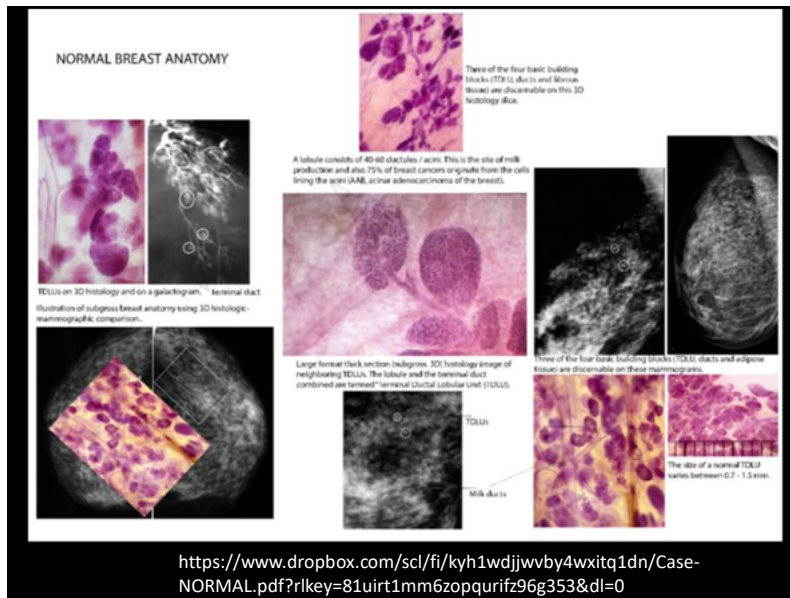
34



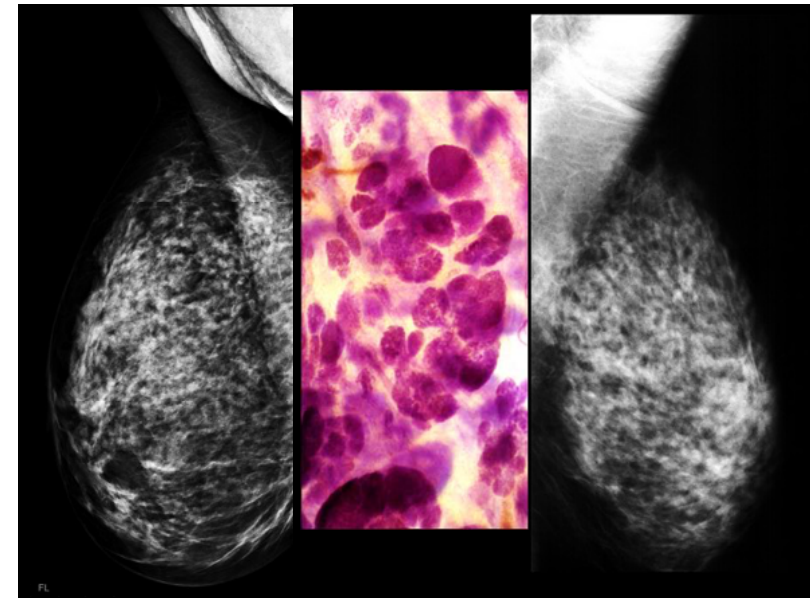
35



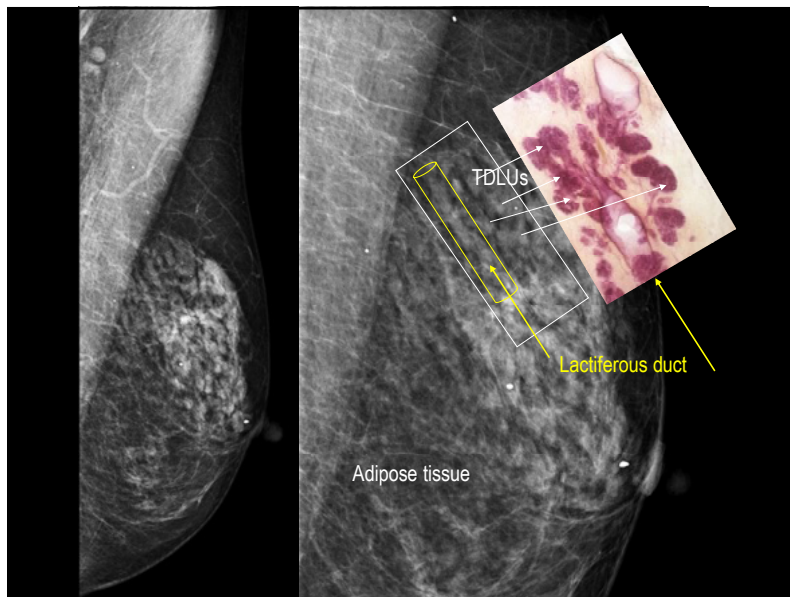
36



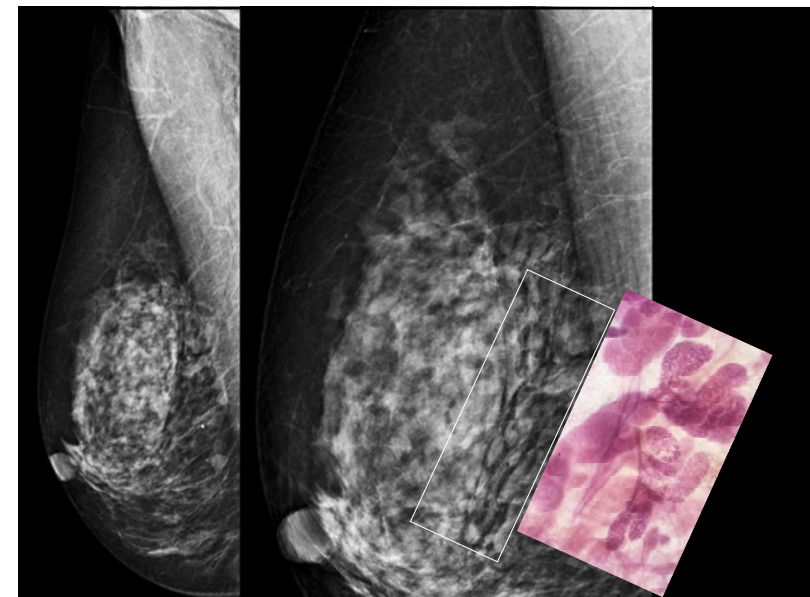
37



38

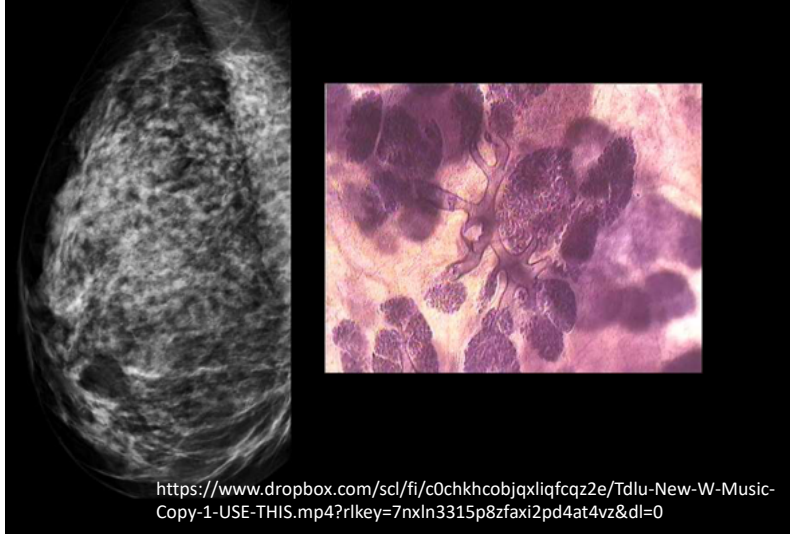


39



40

Histopathologic-mammographic correlation



41

Contents lists available at ScienceDirect

ELSEVIER

European Journal of Radiology

journal homepage: www.elsevier.com/locate/ejrad

Breast cancers originating from the terminal ductal lobular units: *In situ* and invasive acinar adenocarcinoma of the breast, AAB

László Tabár^{a,*}, Peter B. Dean^b, F. Lee Tucker^c, Amy Ming-Fang Yen^d, Jean Ching-Yuan Fann^e, Abbie Ting-Yu Lin^f, Robert A. Smith^g, Stephen W. Duffy^h, Tony Hsiu-Hsi Chenⁱ

<https://www.dropbox.com/scl/fi/epzhqavxd1syjvsjnnnm/Article-2.pdf?rlkey=xmb5c2iw0mvgsa1he1zgt0brd&dl=0>

AI generated video of the article above:

<https://youtu.be/KGZfRQGWLtU?si=VXSvmJqfb20IER7J>

42

The lobule and the terminal duct, which drains it, form an integrated functional entity, called the **terminal ductal lobular unit (TDLU)**

Most benign and malignant breast diseases originate from the TDLU, **not from the ducts.**

43

Lobule **Acini**

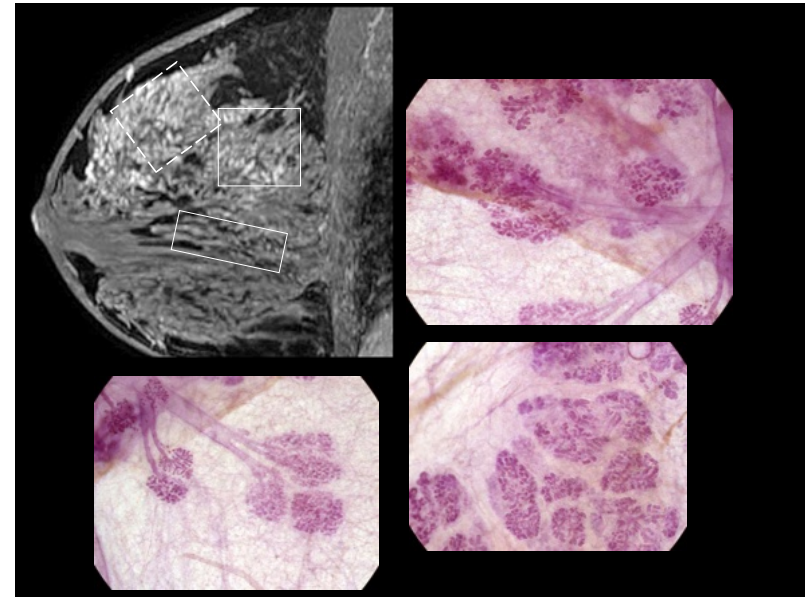
Intralobular terminal duct
Ductules (Acini)
Extralobular terminal duct
Lobule
Terminal Ductal Lobular Unit (TDLU)

44

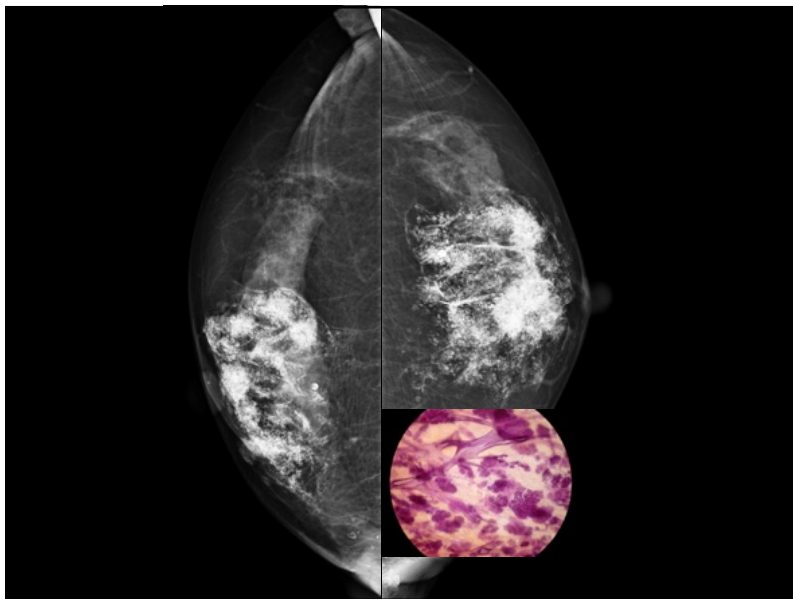
Breast MRI – 3D histologic correlation
of normal breast tissue



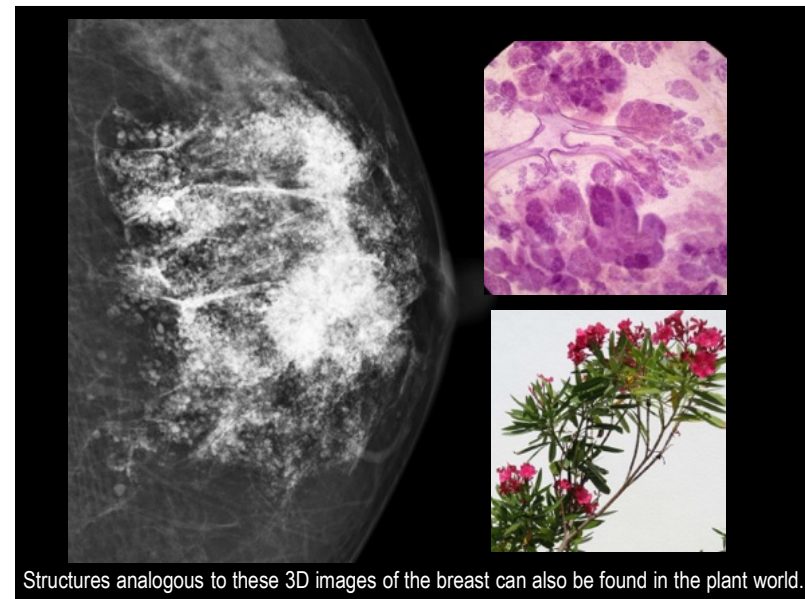
45



46

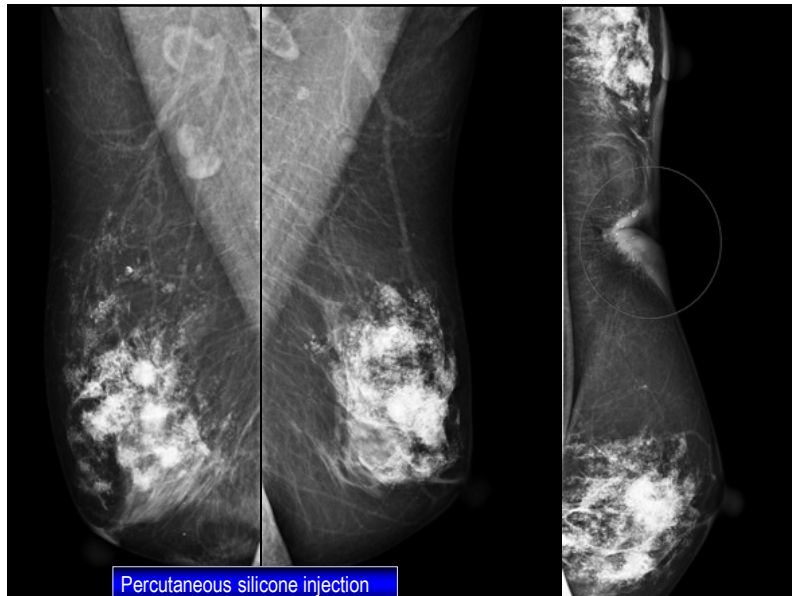


47



Structures analogous to these 3D images of the breast can also be found in the plant world.

48



49

BI-RADS C BI-RADS A BI-RADS B BI-RADS D BI-RADS V

Pattern I Pattern II Pattern III Pattern IV Pattern V

The four basic structural elements (**lobules, milk ducts, fat and fibrous connective tissue**) of normal breast tissue are always present in every woman's breast, even if their relative proportions may vary widely. This variation results in five characteristic presentations on the mammogram, called the mammographic parenchymal patterns.

- These patterns can affect the mammographic detectability of a small breast cancer.
- Our classification is a "qualitative classification" based on large format histopathologic-mammographic correlation, taking into account the *relative proportion* of the four basic building blocks of the breast.

50

BI-RADS C BI-RADS A BI-RADS B BI-RADS D BI-RADS V

Pattern II Pattern III Pattern IV Pattern V

lobules, milk ducts, fat and fibrous connective tissue

mammographic detectability of a small breast cancer.

51

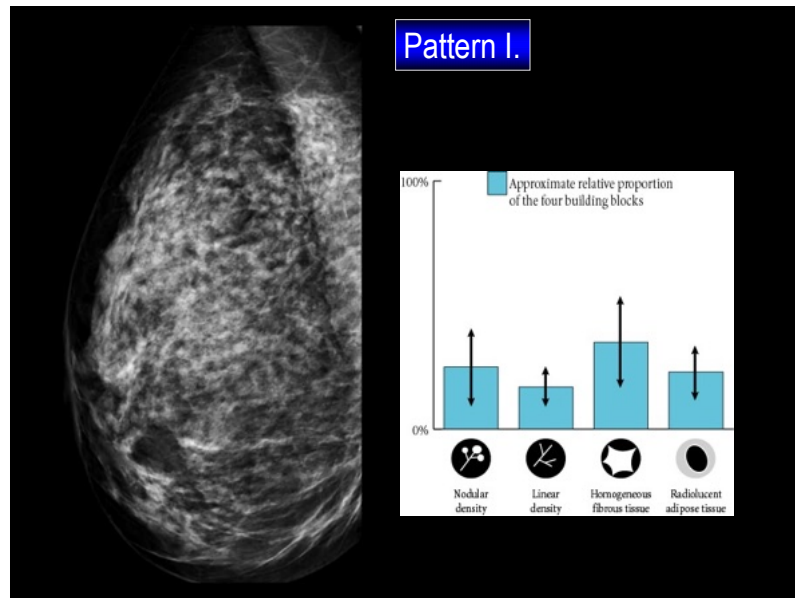
BI-RADS C BI-RADS A BI-RADS B BI-RADS D BI-RADS V

Pattern I Pattern II Pattern III Pattern IV Pattern V

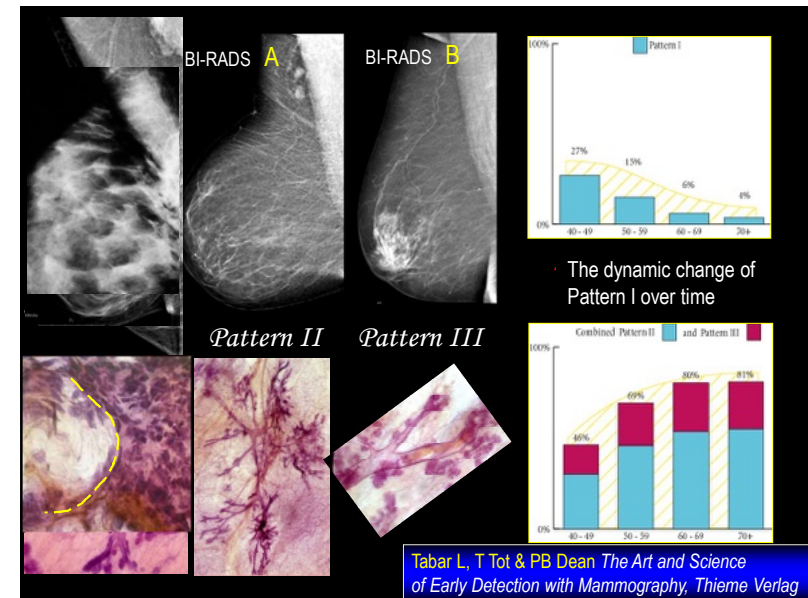
This classification is a "qualitative classification" based on large format histopathologic-mammographic correlation. A thorough comparison between the large format histologic image of the surgically removed breast tissue and the mammograms resulted in this classification, which is based on the relative proportion of the four basic building blocks of the breast.

The American BIRADS classification is a simple "quantitative" classification, based on the amount of radiopaque/dense tissue seen on the mammogram: fatty replaced breast, <25% dense tissue, 50% dense breast tissue, >75% dense breast tissue. The BIRADS classification does not take the underlying histologic composition into account.

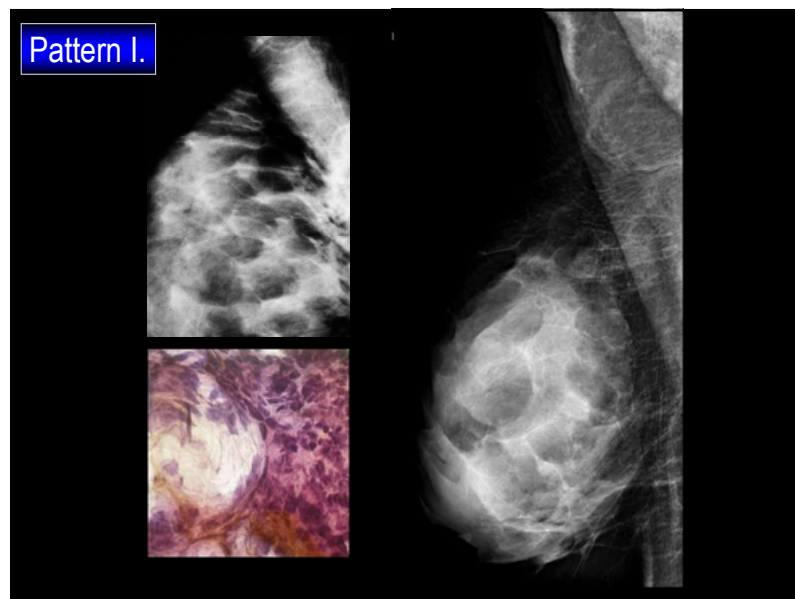
52



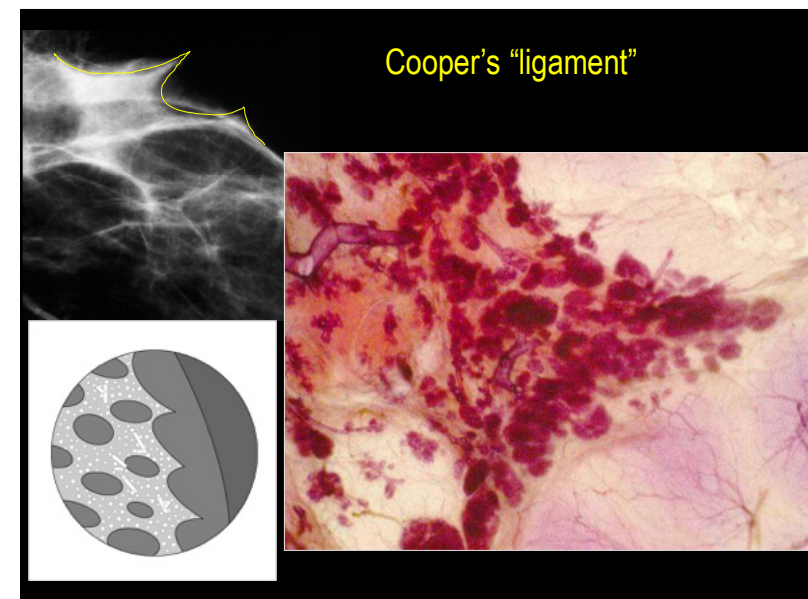
53



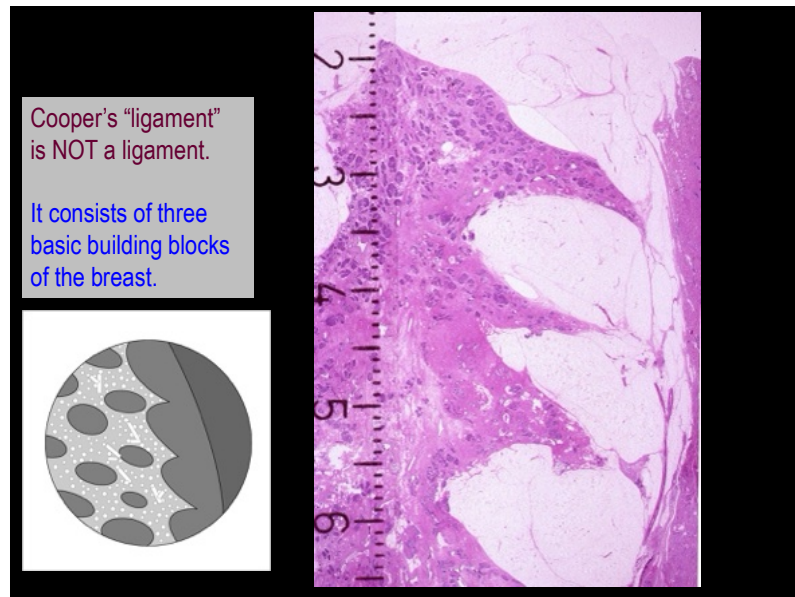
54



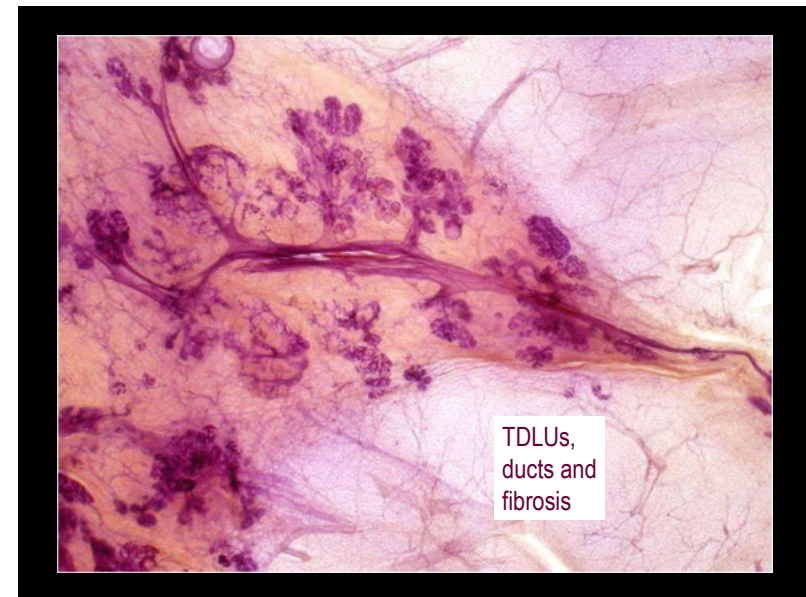
55



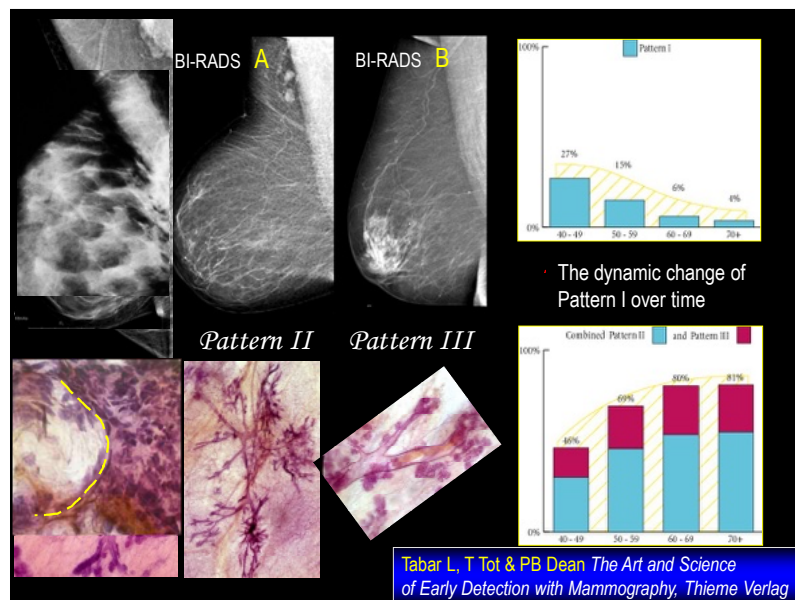
56



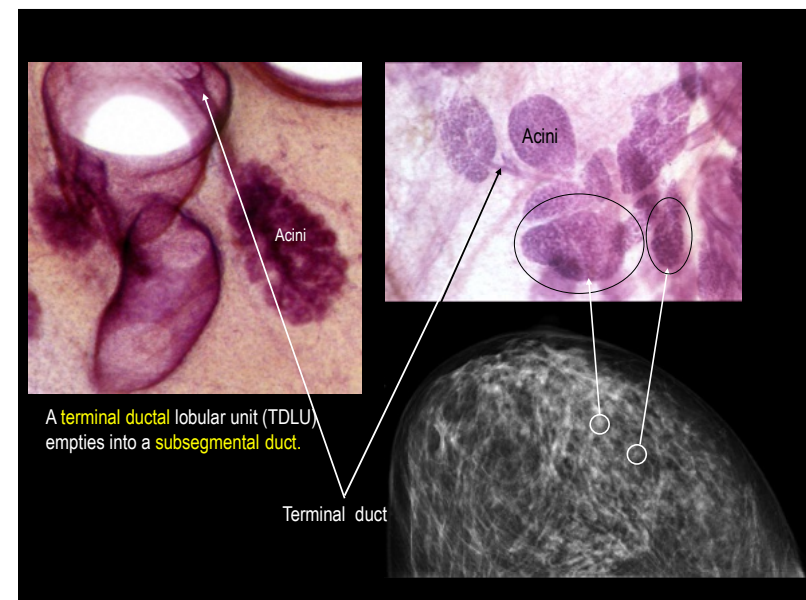
57



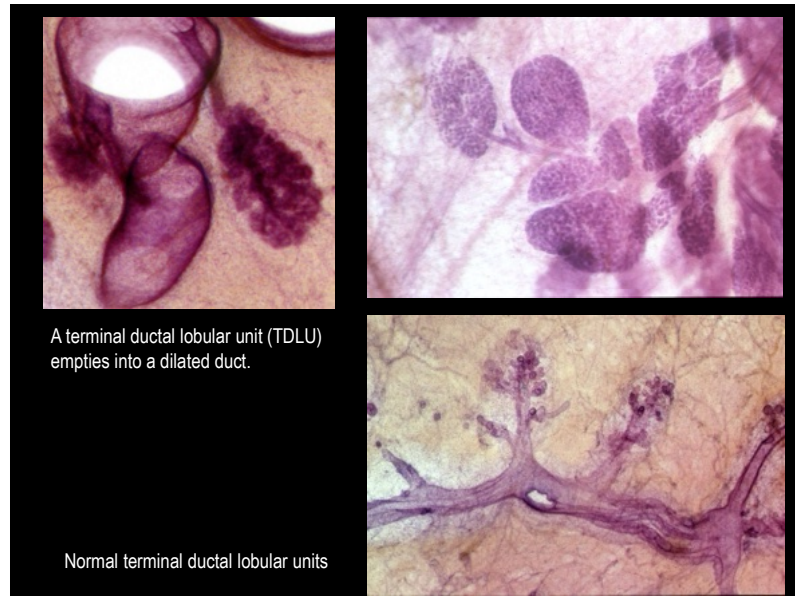
58



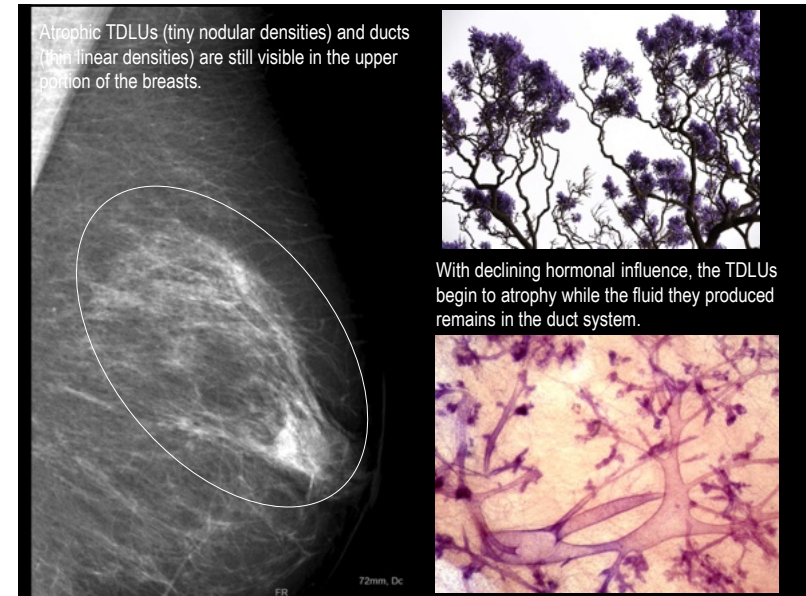
59



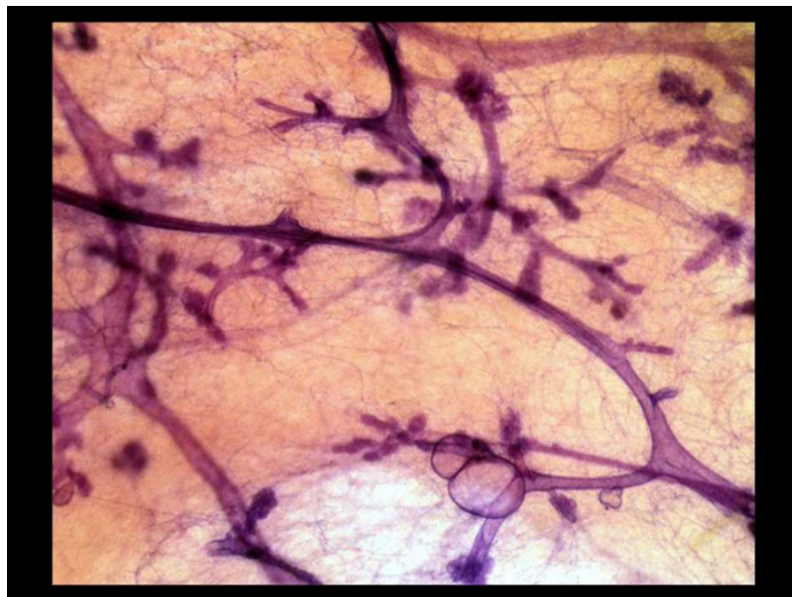
60



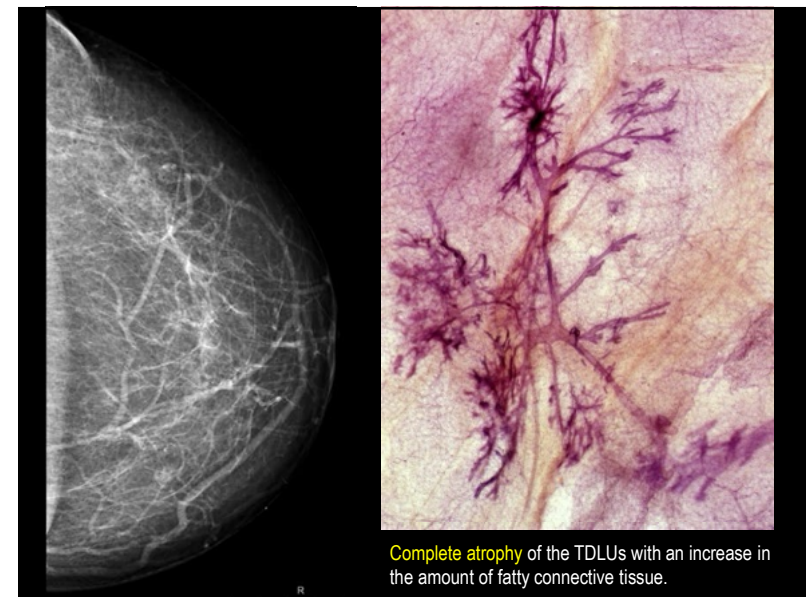
61



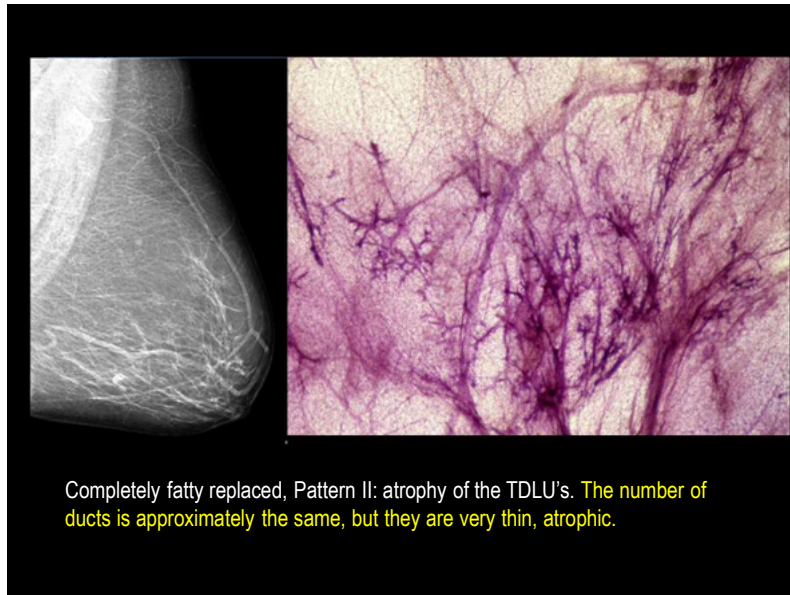
62



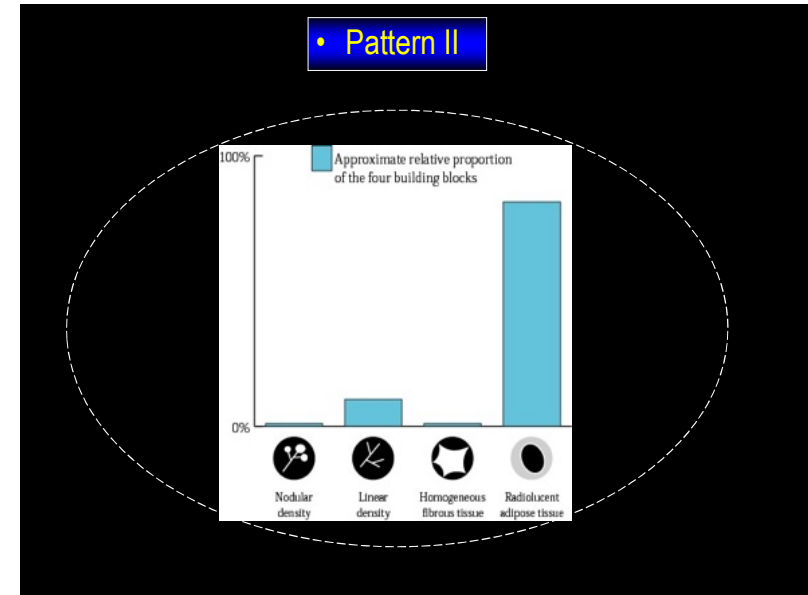
63



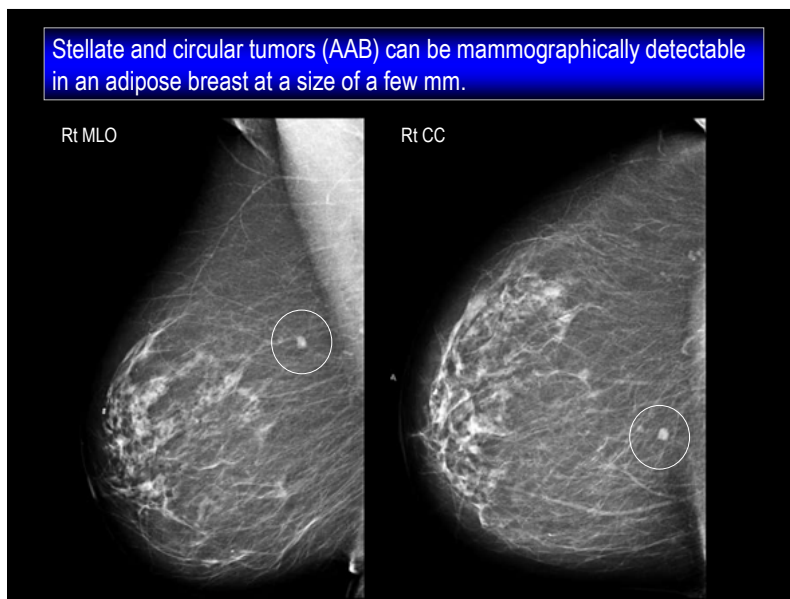
64



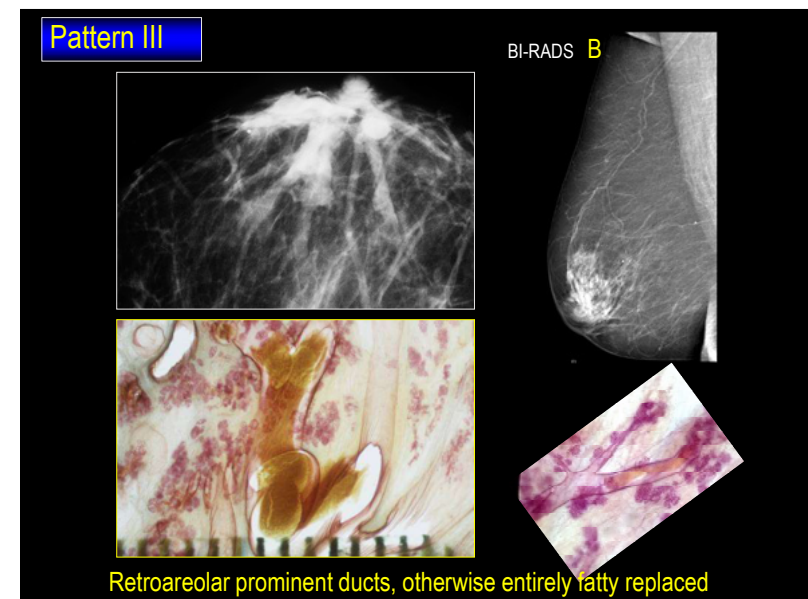
65



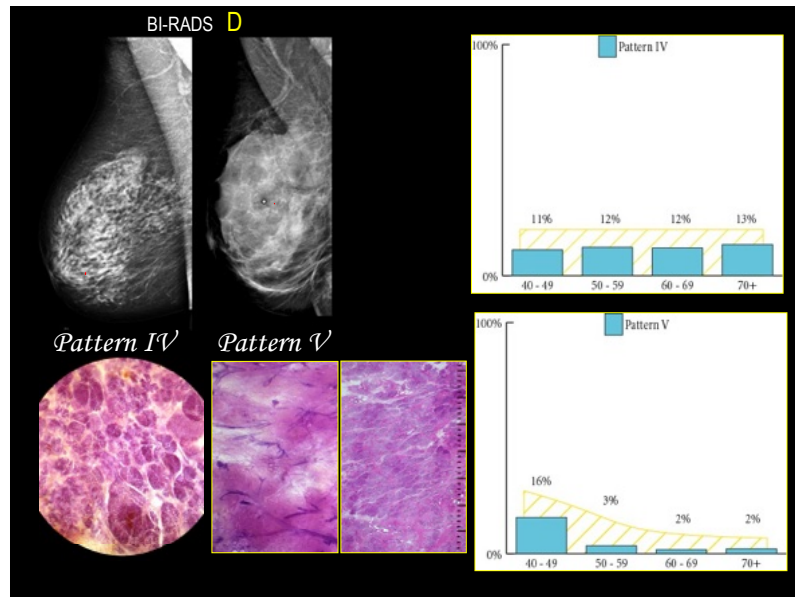
66



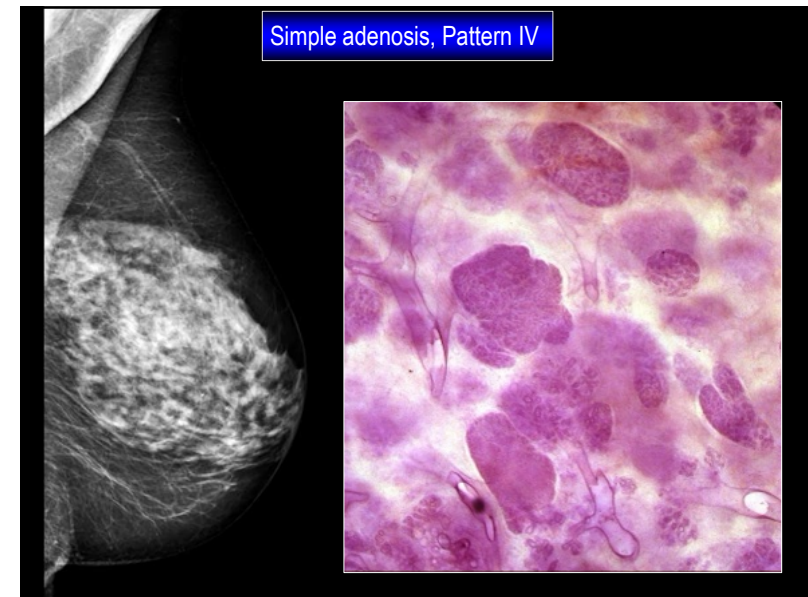
67



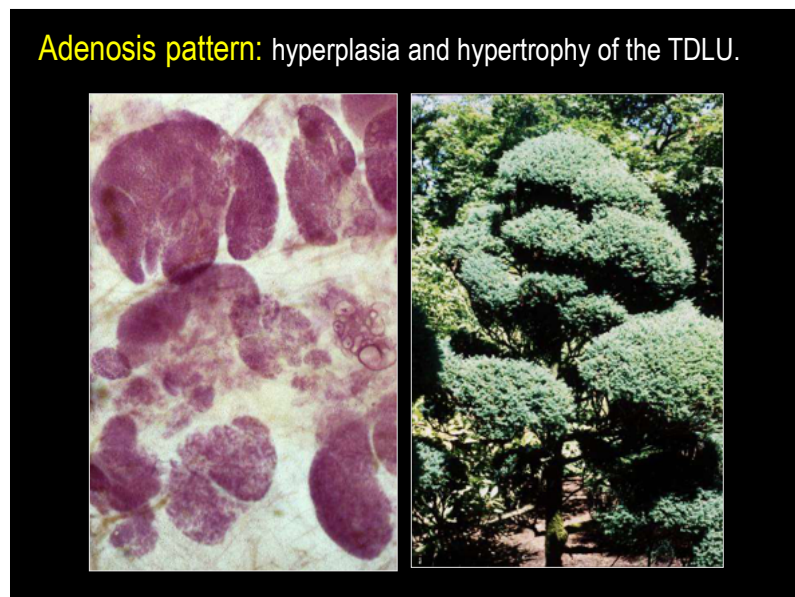
68



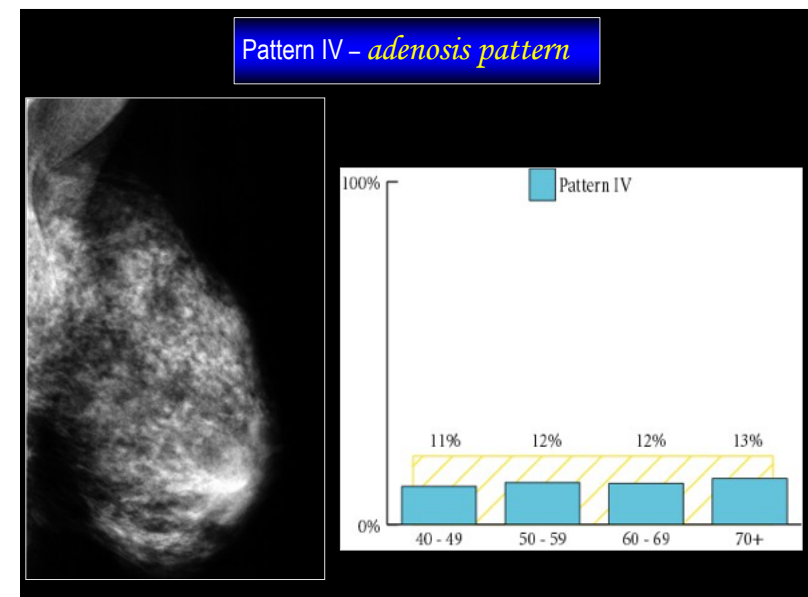
69



70



71



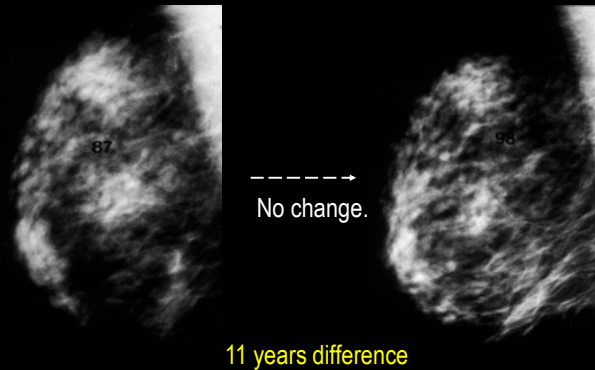
72

Pattern IV does not change over time

Pattern IV.

Pattern IV.

----->Time



73

© International Epidemiological Association 2000 Printed in Great Britain

International Journal of Epidemiology 2000;29:11-19

Mammographic parenchymal patterns and risk of breast cancer at and after a prevalence screen in Singaporean women

RW Jakes,^a SW Duffy,^b FC Ng,^c F Gao^{a,d} and EH Ng^e

Background The objective of this study was to assess the effect of mammographic parenchymal patterns on risk of breast cancer detected at first screen or in the period following a negative screen.

Methods The study utilizes a nested case-control design with 132 breast cancer patients detected at first screen (from a total of 29 193 screened) and 42 breast cancer patients detected in the period following the first screen. These patients were matched to 348 screened-negative controls. The mammograms were classified according to Tabar's classification for parenchymal pattern and statistical analysis was done by conditional logistic regression.

Results The risk of breast cancer for women with Tabar pattern IV was significantly high when compared to the remaining patterns (odds ratio 2.59). Risk factors for Tabar pattern IV coincided largely with established risk factors for breast cancer.

Conclusion The study confirms the increased risk of breast cancer associated with Tabar pattern IV (approximately Wolfe pattern F2), in an Asian population. This pattern is associated with nulliparity and high educational status and is strongly associated with grade 3 cancers.

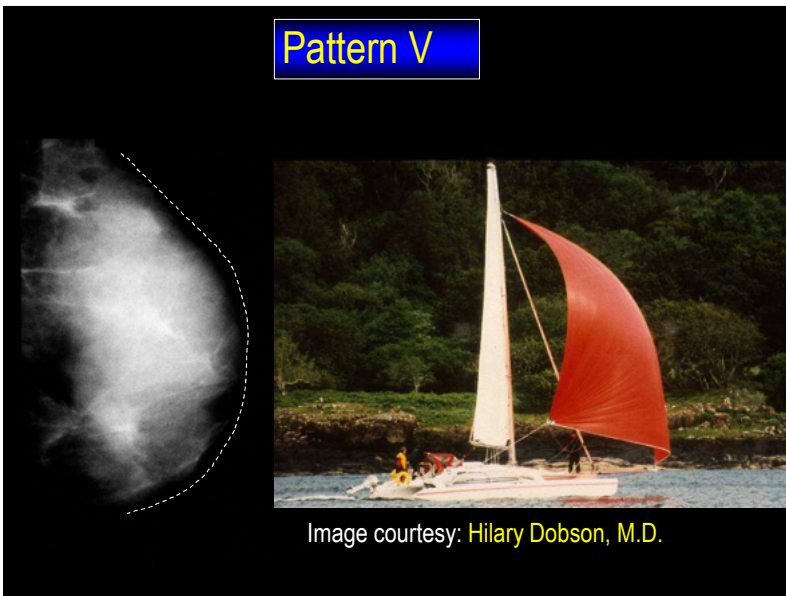
Keywords Breast cancer, mammography, parenchymal patterns, Asian women, case control study

Accepted 27 July 1999

Downloaded from <http://ije.oxfordjournals.org/> by guest on

74

Pattern V



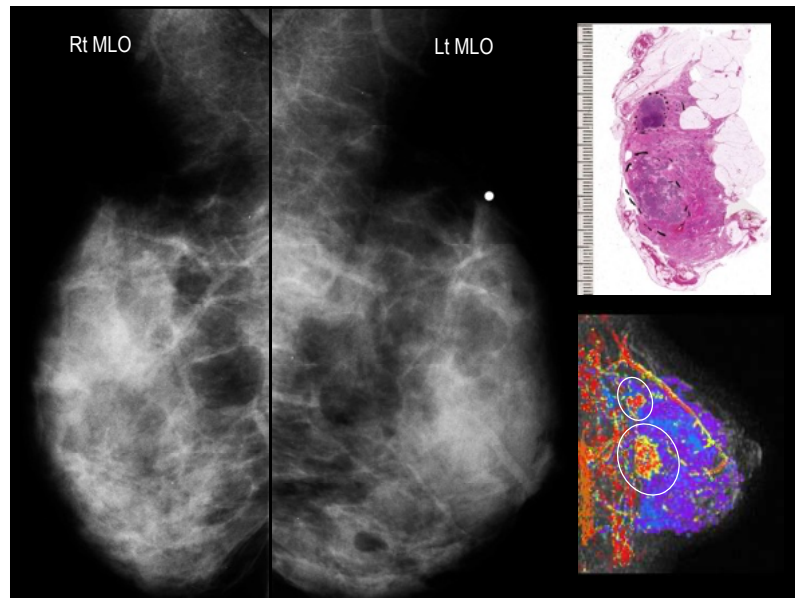
75

Rt MLO

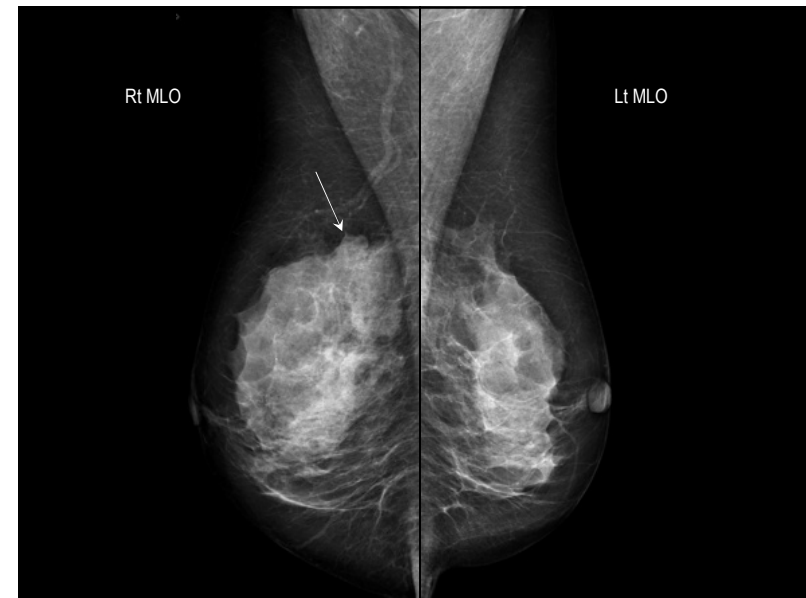
Lt MLO



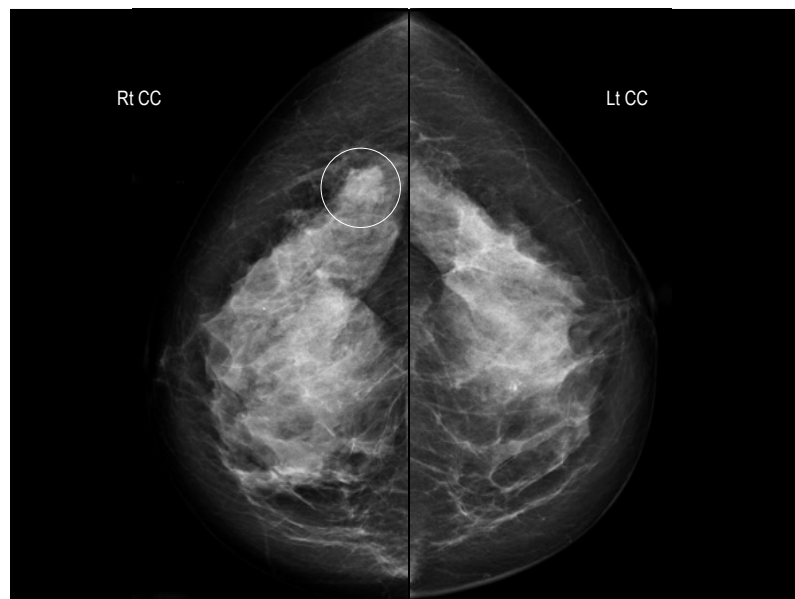
76



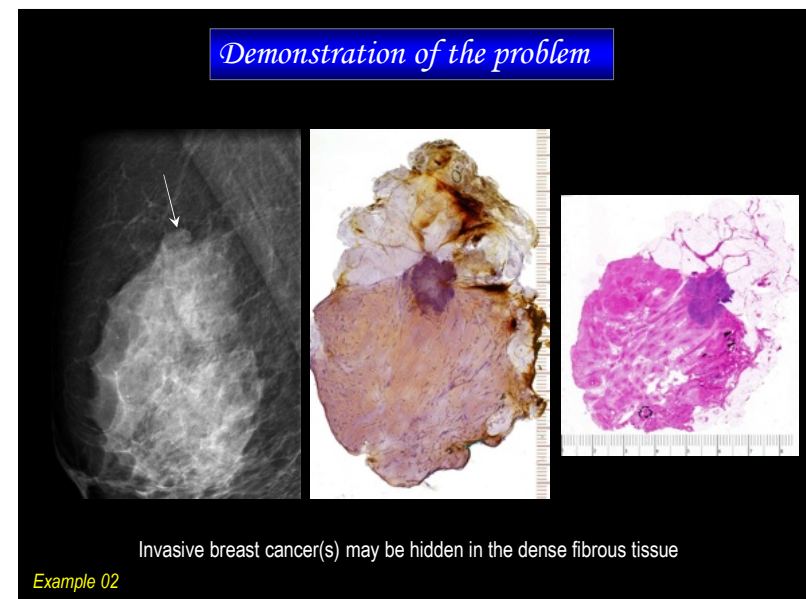
77



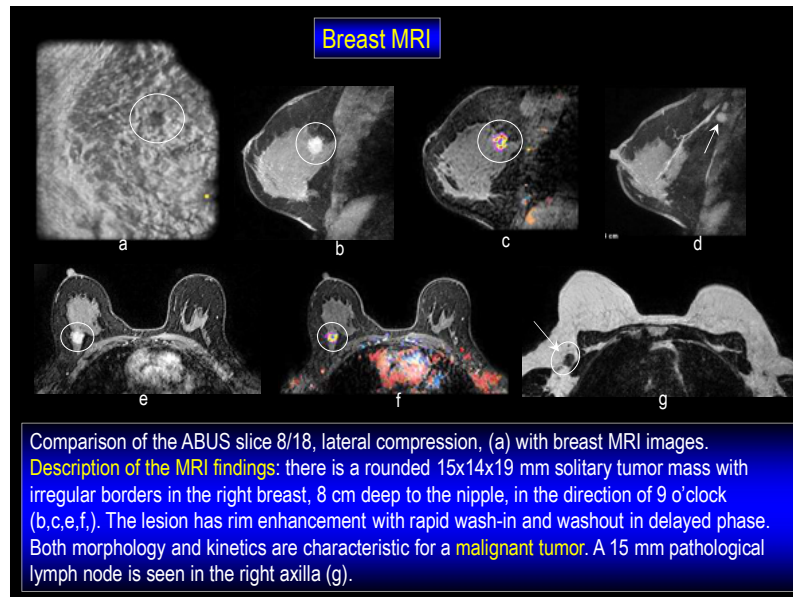
78



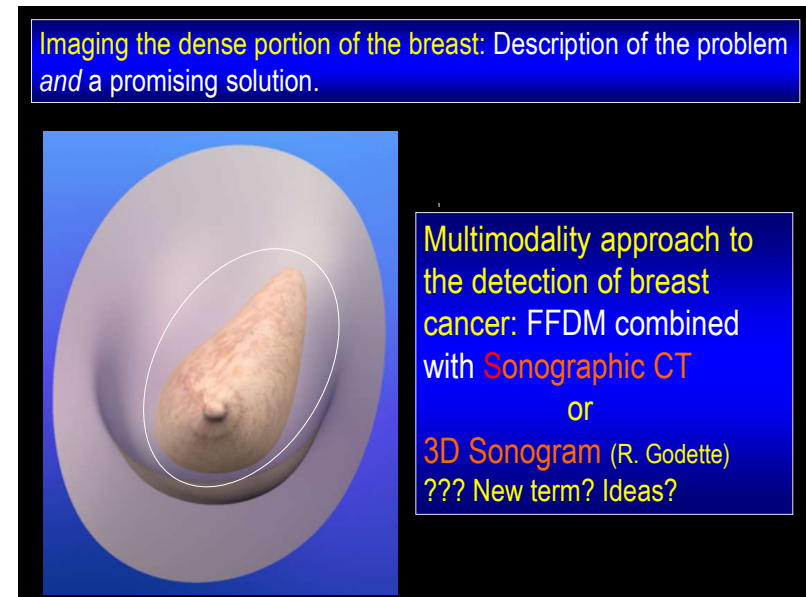
79



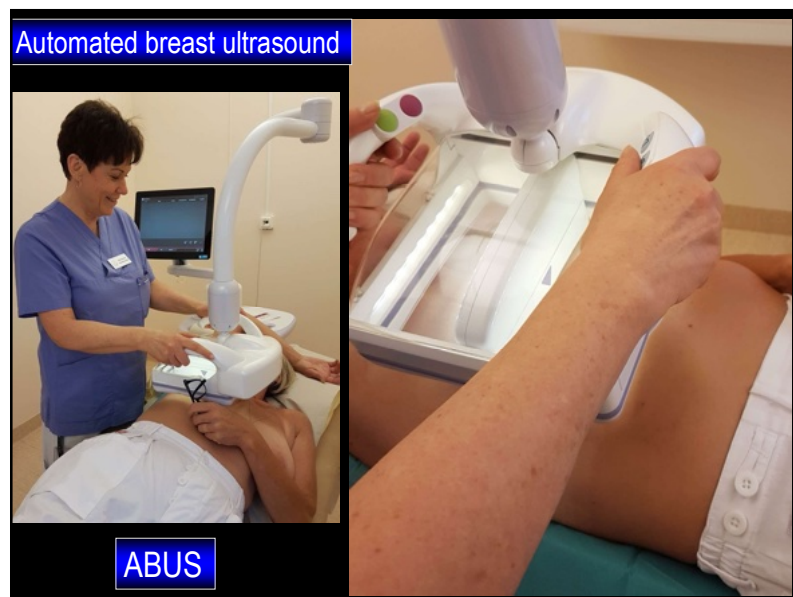
80



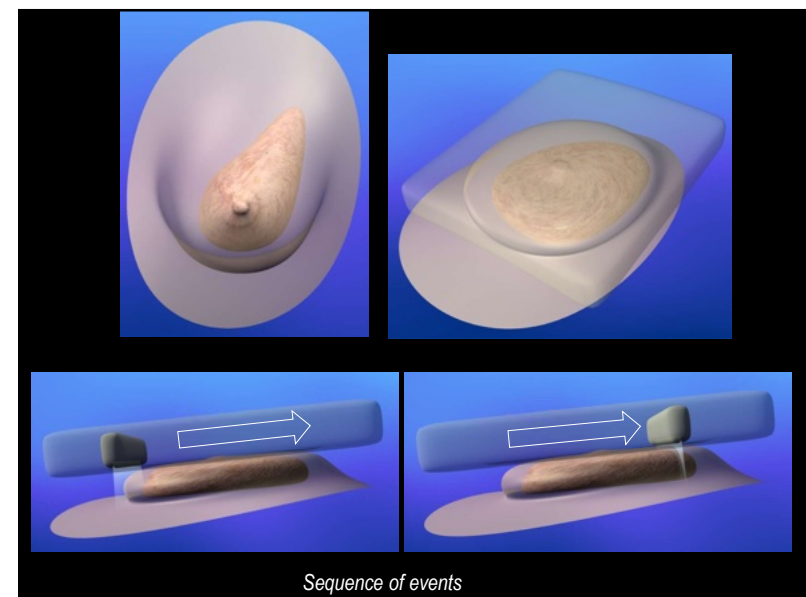
81



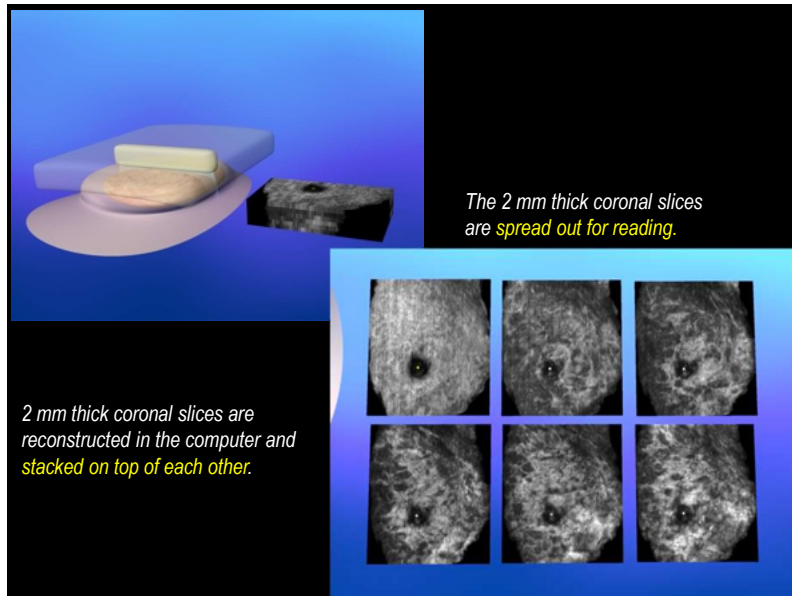
82



83



84



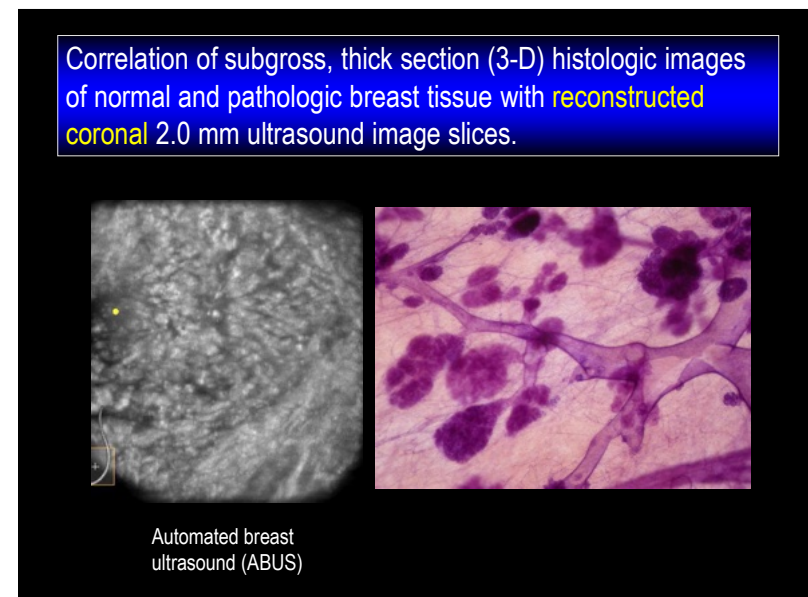
85



86

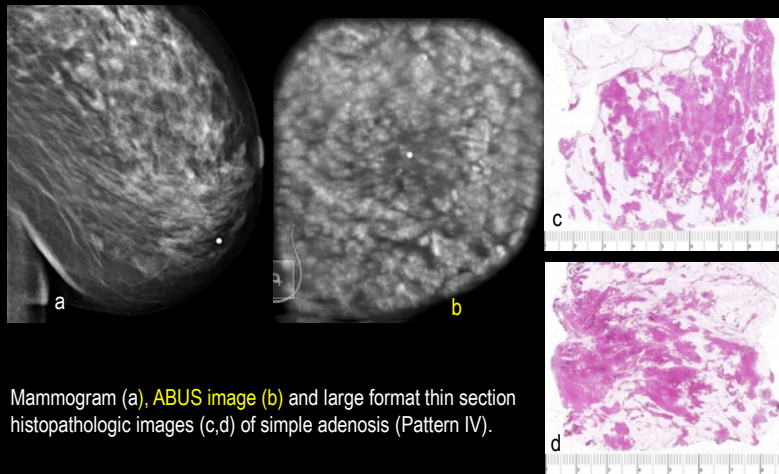


87



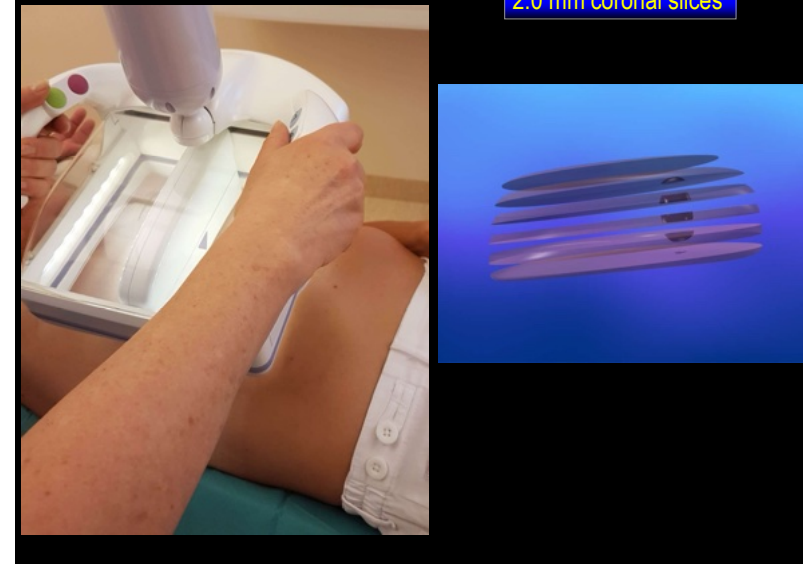
88

Comparison of ABUS with 3D histopathology, **Pattern IV.**



89

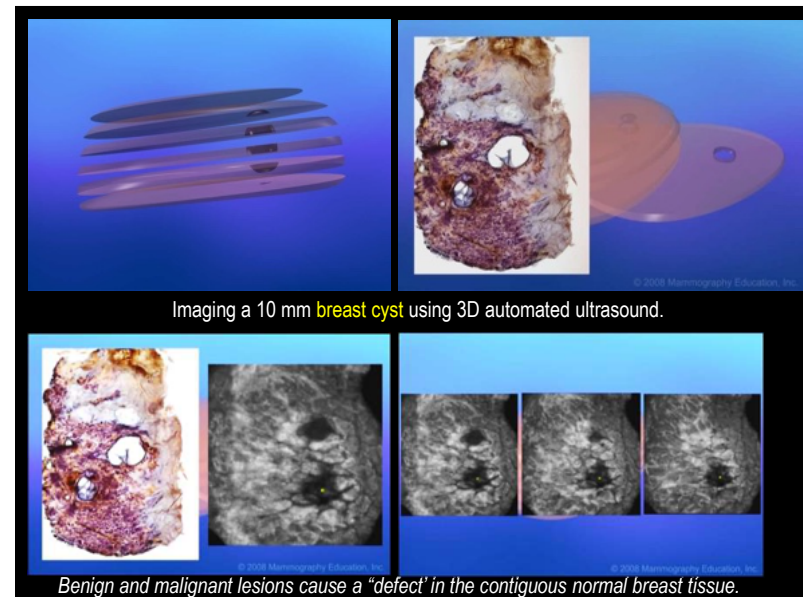
2.0 mm coronal slices



90

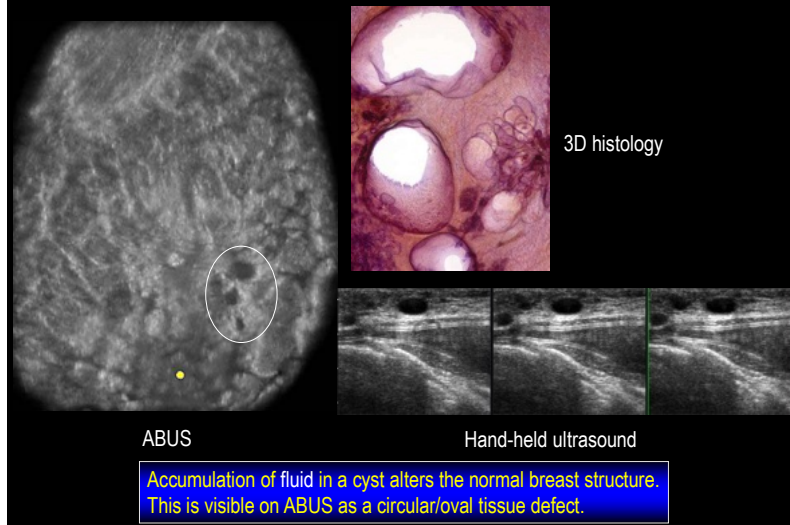


91

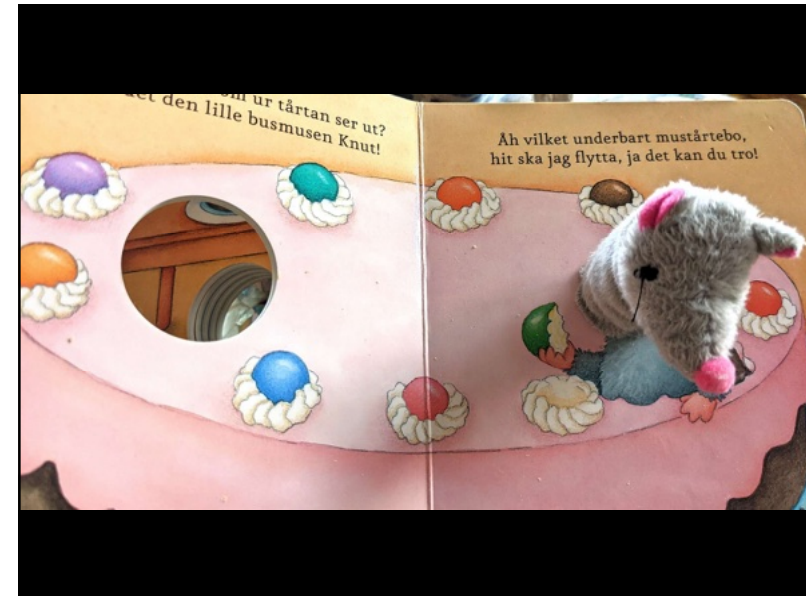


92

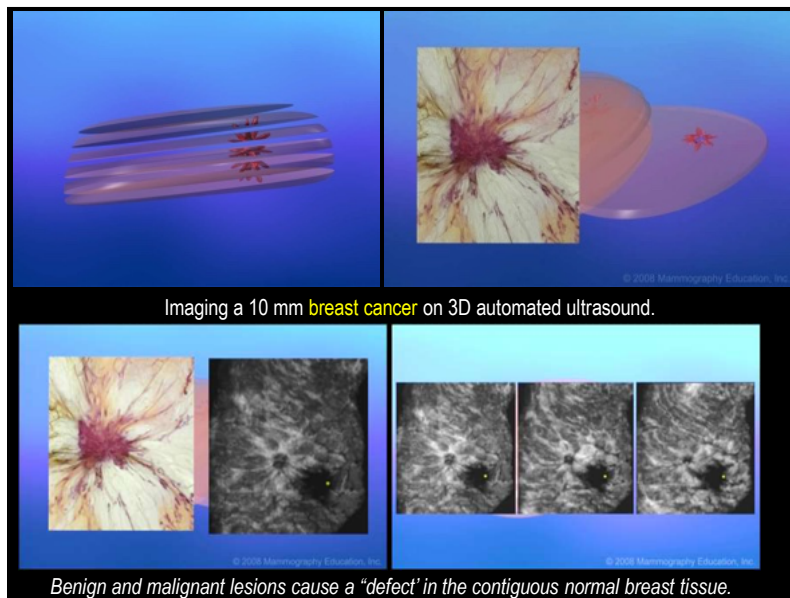
ABUS presentation of pathological breast lesions



93



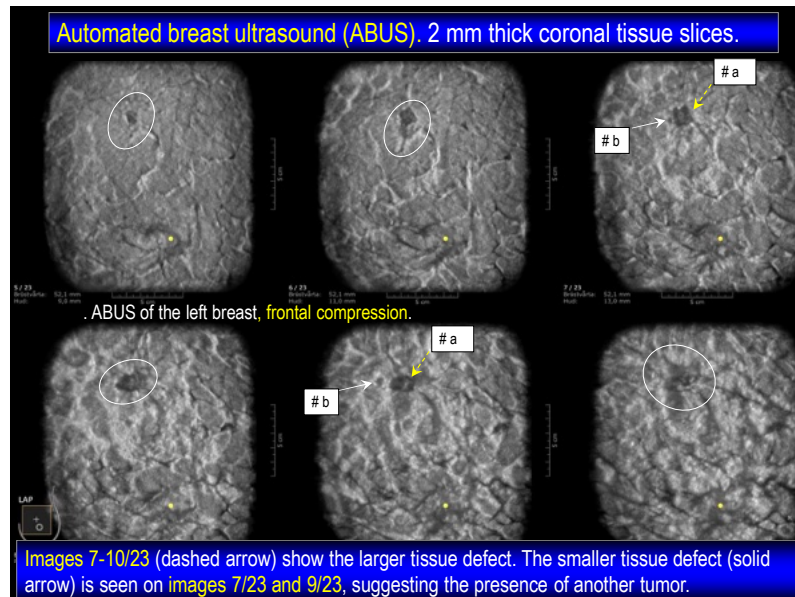
94



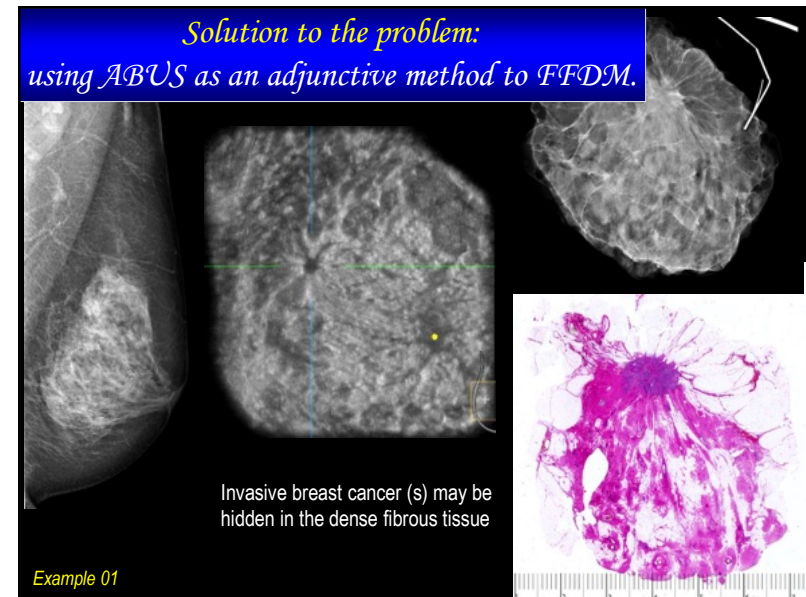
95



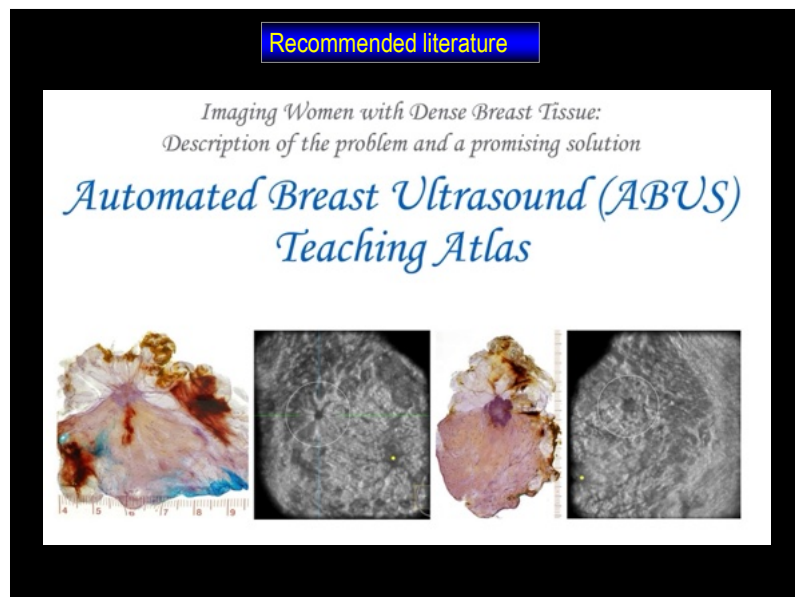
96



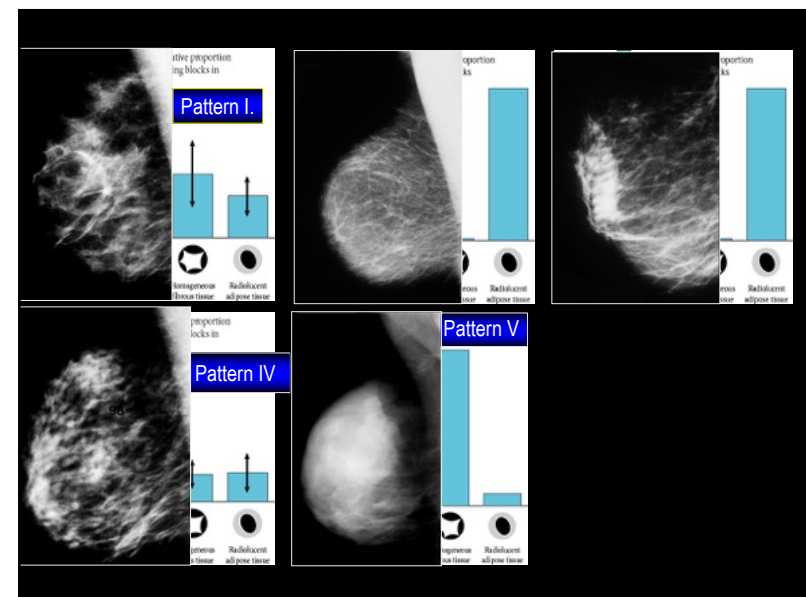
97



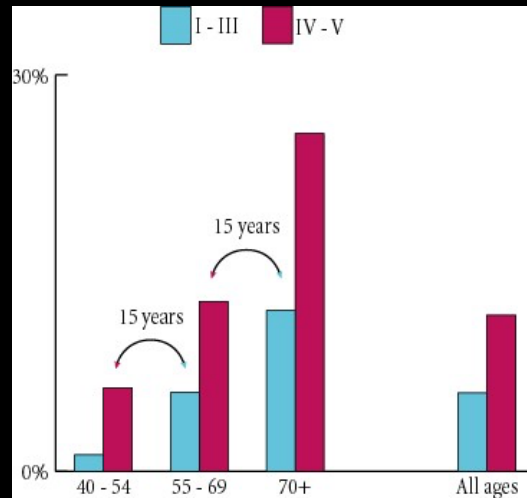
98



99



100

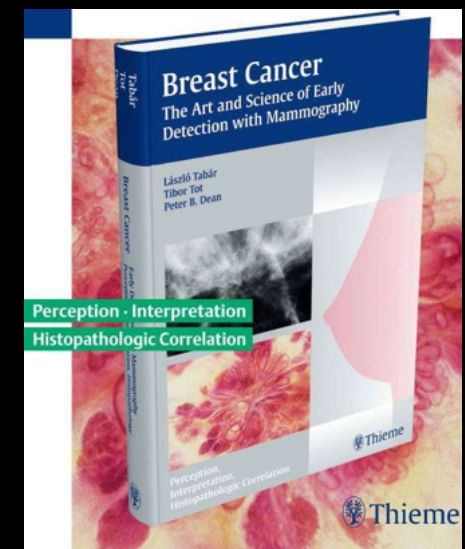


101

Recommended literature

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

www.thieme.com



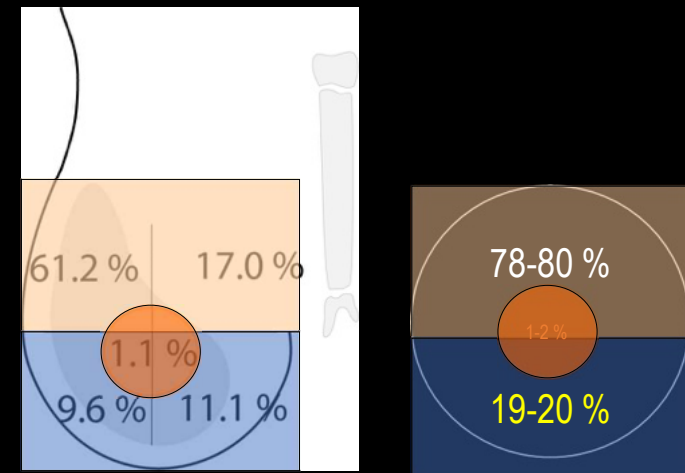
102

Where to look?

- To detect *AABs*
- To detect *DABs*
- To detect diffusely infiltrating breast malignancy of mesenchymal origin

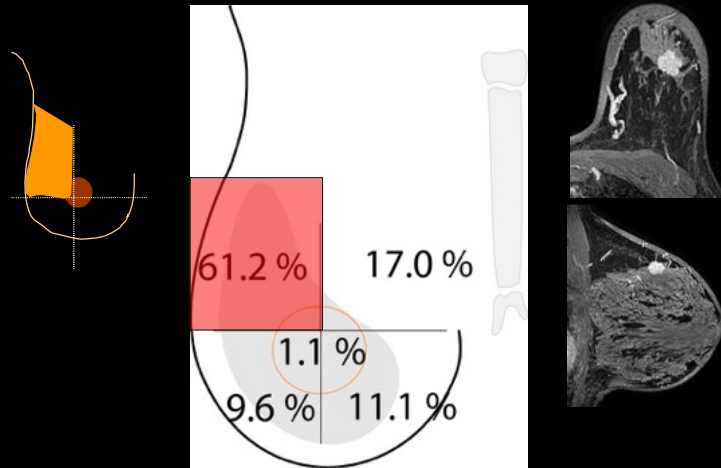
103

Distribution of 1-14 mm breast cancers (# 981) according to location in the breast

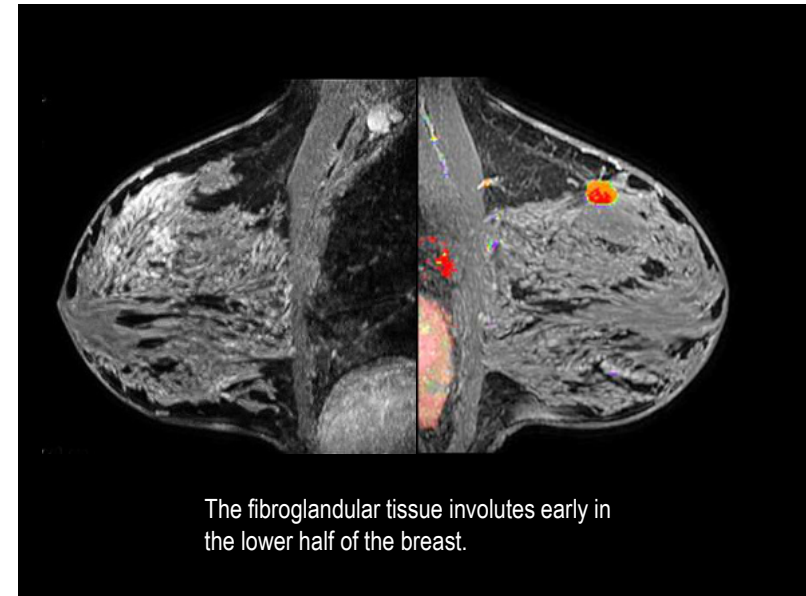


104

*Distribution of 1-14 mm breast cancers
(# 981) according to location in the breast*

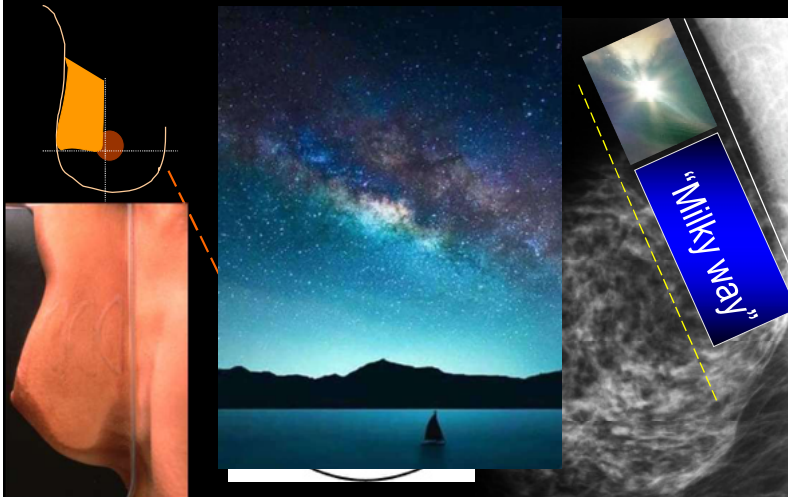


105



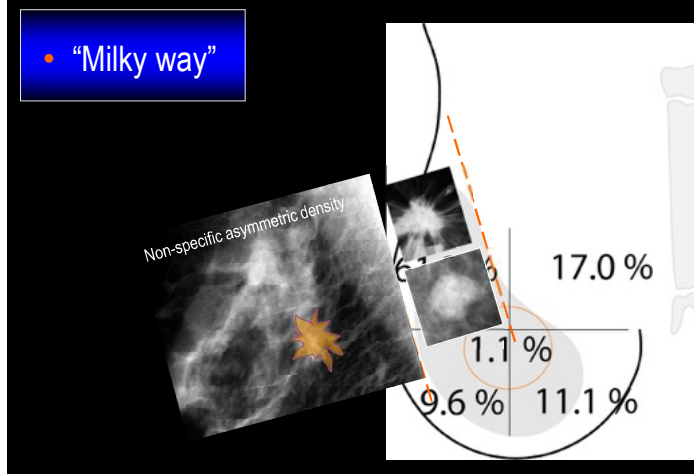
106

*Distribution of 1-14 mm breast cancers
(# 981) according to location in the breast*



107

*Side by side, step by step viewing
Areas that require special attention*

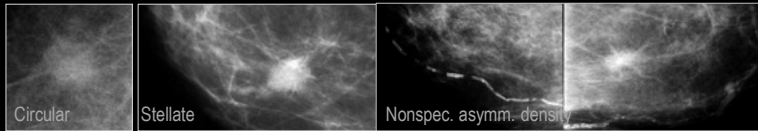
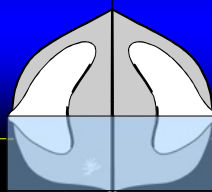


108

Side by side, step by step viewing
Areas that require special attention

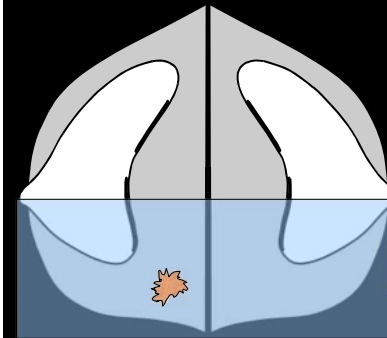
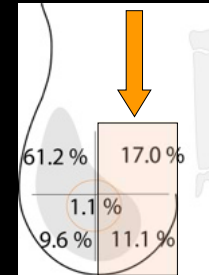
Locations with high frequency of abnormal lesions
 ("forbidden areas"):

- "Milky way"
- The medial half of the breast



109

Side by side, step by step viewing
Areas that require special attention



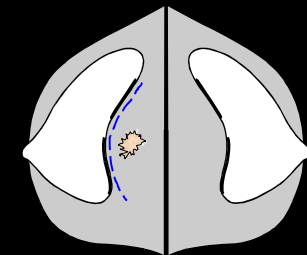
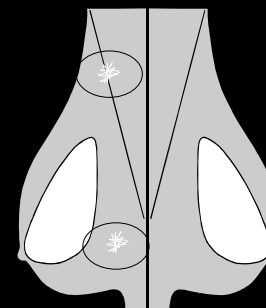
The medial half of the breast

110

Side by side, step by step viewing
Areas that require special attention

Locations with high frequency of abnormal lesions
 ("forbidden areas"):

- "Milky way"
- The medial half of the breast
- Retroglandular clear space ("no man's land")



The retroglandular clear space
 ("no man's land")

111

112

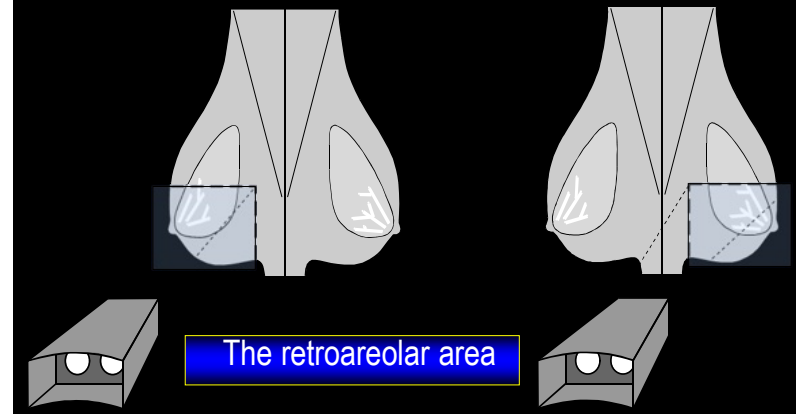
Side by side, step by step viewing
Areas that require special attention

Locations with high frequency of abnormal lesions
 ("forbidden areas"):

- "Milky way"
- The medial half of the breast
- Retroglandular clear space ("no man's land")
- The retroareolar area

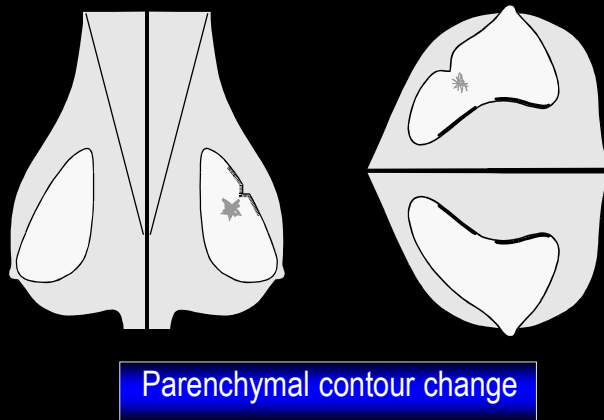
113

Side by side, step by step viewing
Areas that require special attention



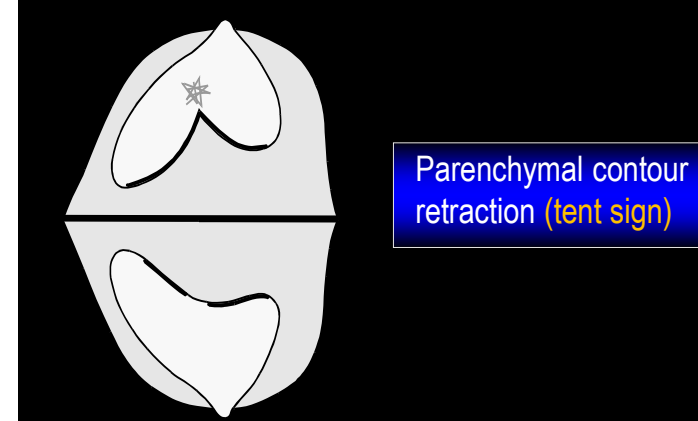
114

Aim of perception
 Disruption of the harmonic structure



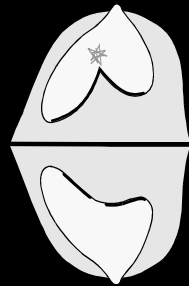
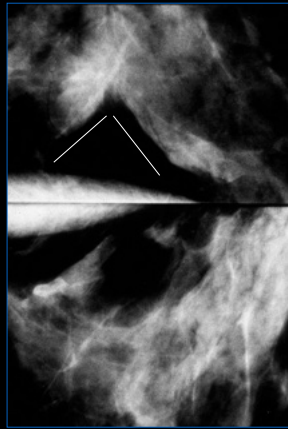
115

Aim of perception
 Disruption of the harmonic structure



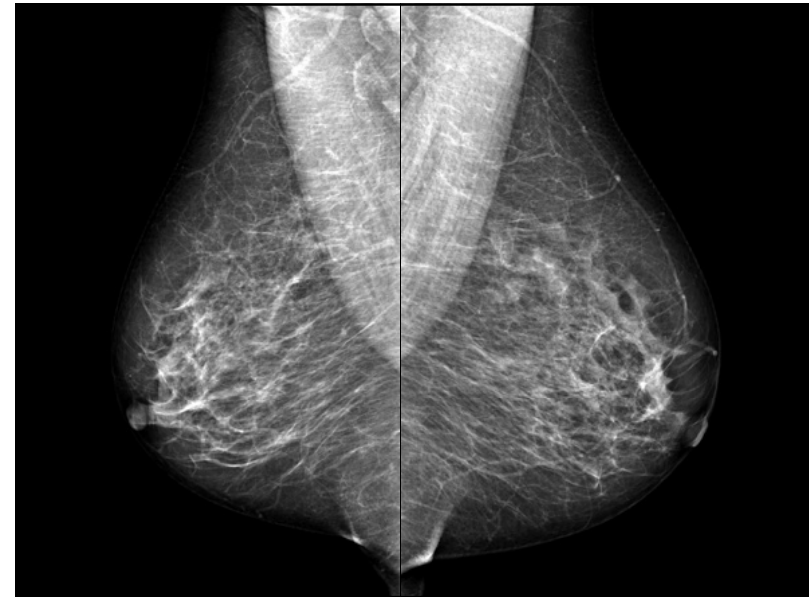
116

Aim of perception
Disruption of the harmonic structure

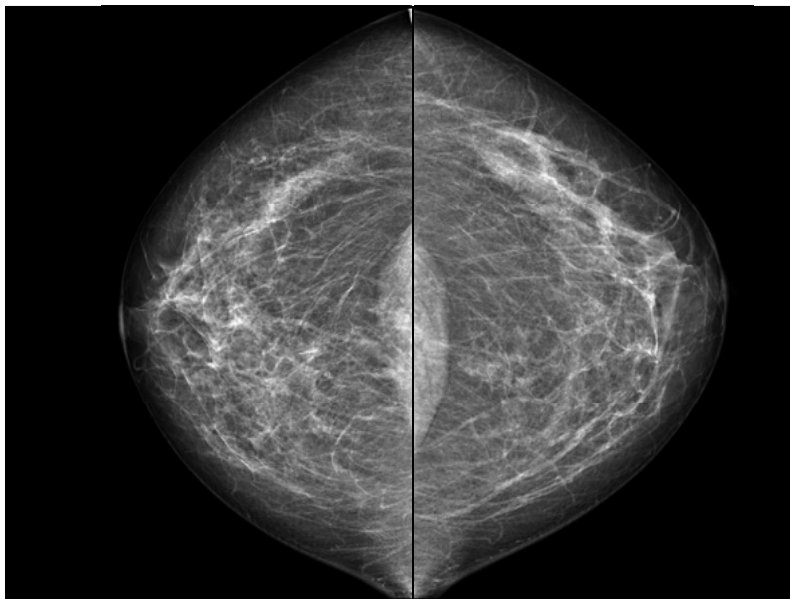


Parenchymal contour
 retraction (**tent sign**)

117



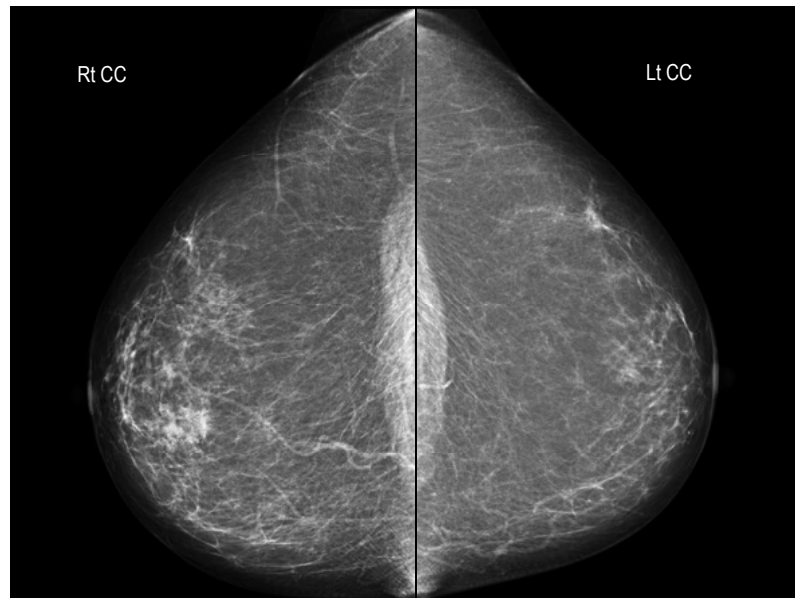
118



119



120



121

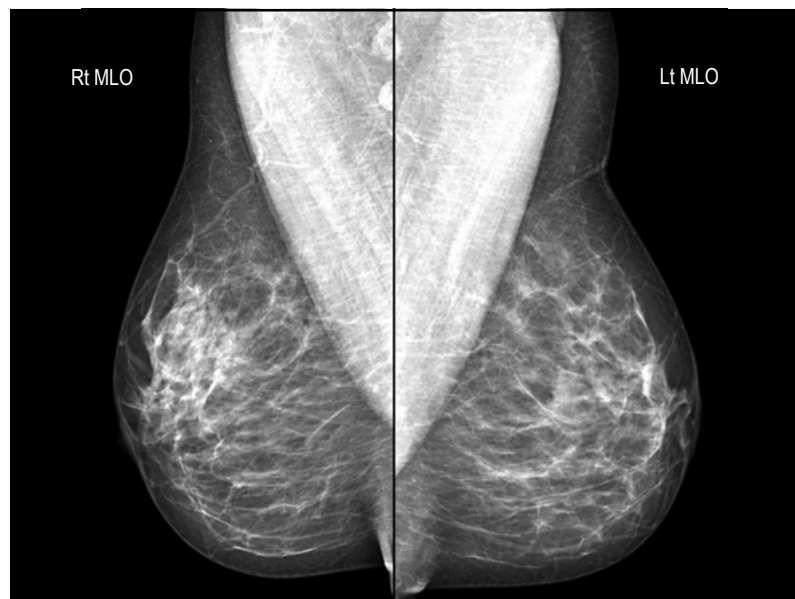
53-year-old asymptomatic woman, called back from mammography screening for assessment of the finding on her mammogram.



Case 1289

From the Departments of Mammography
Surgery and Clinical Pathology
Falun Central Hospital, Sweden ©

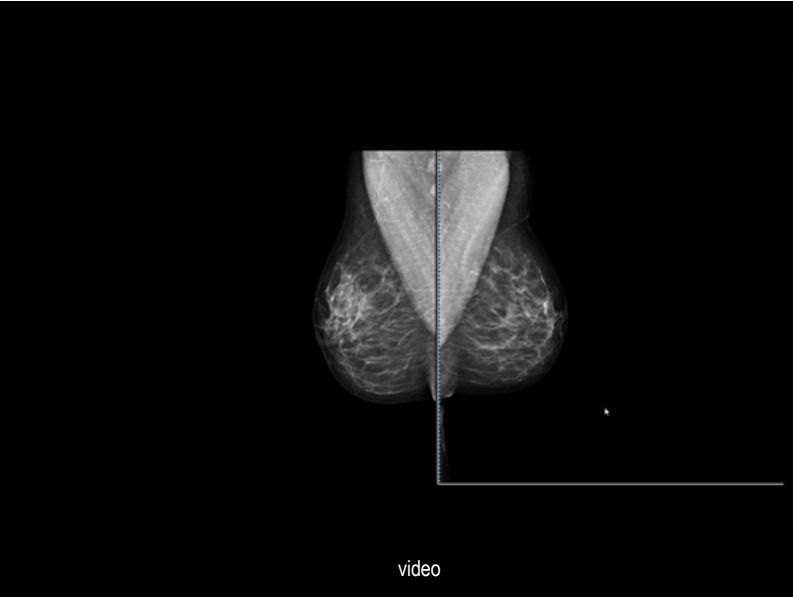
122



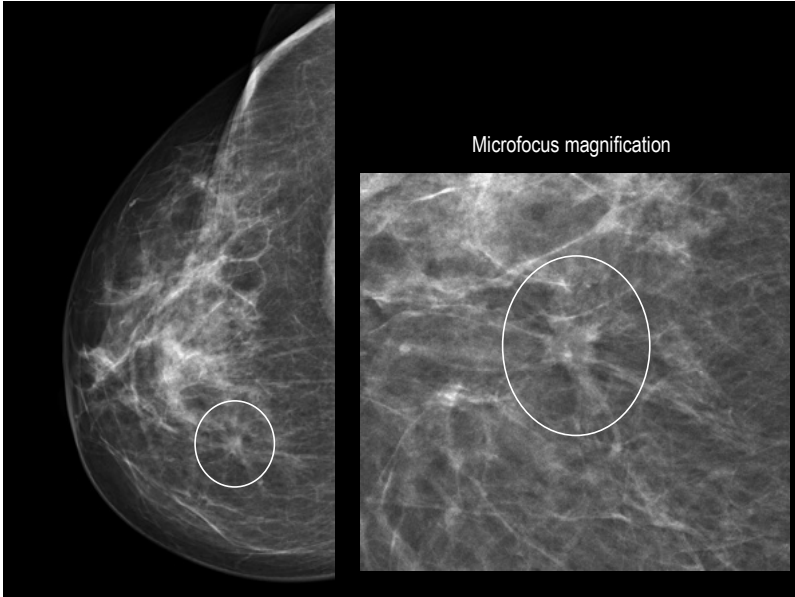
123



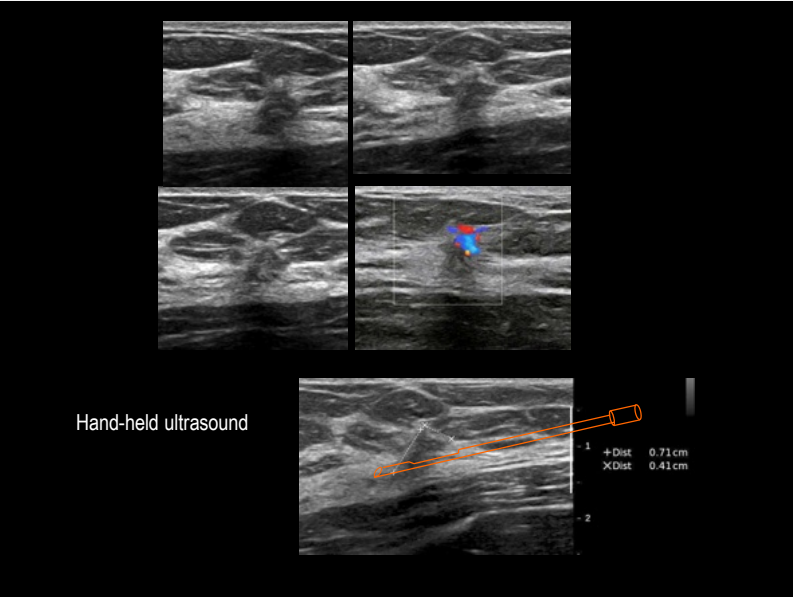
124



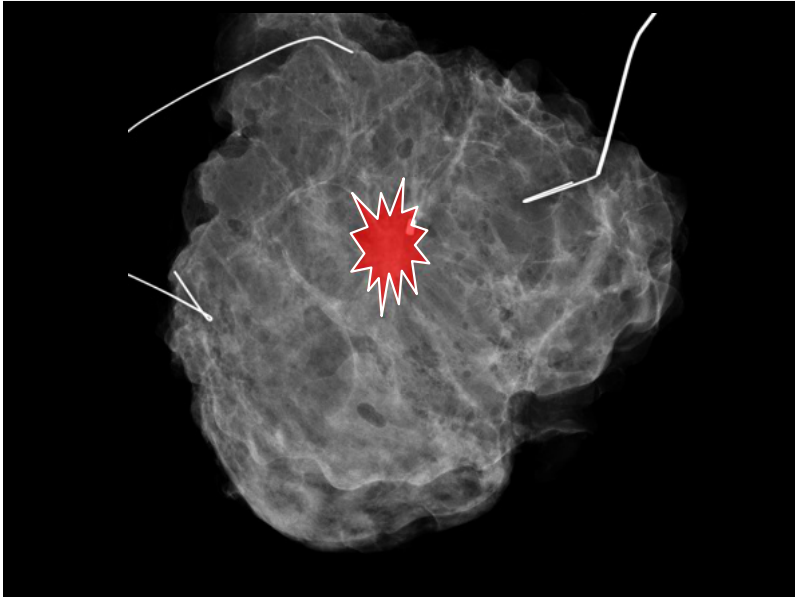
125



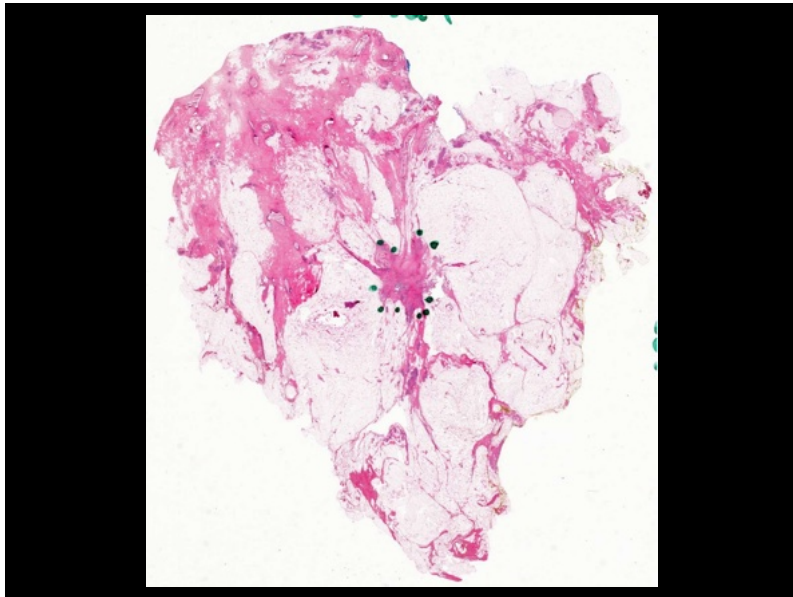
126



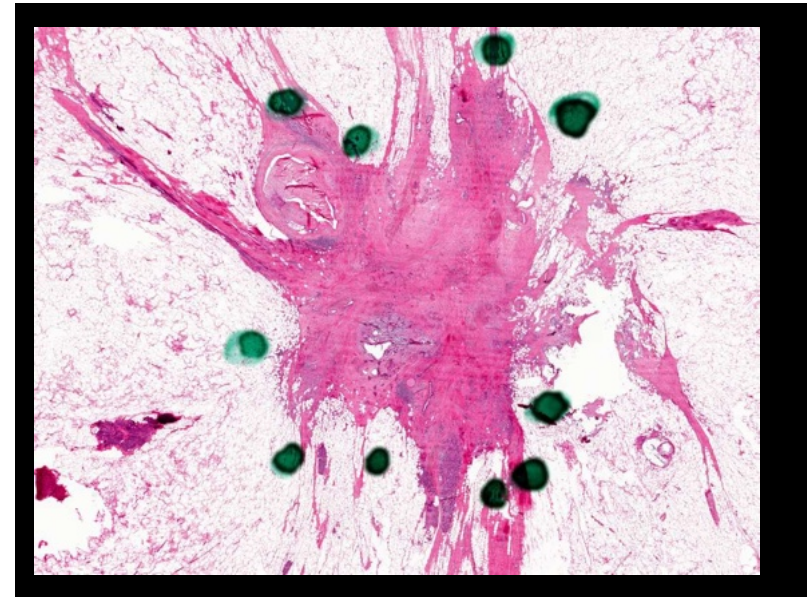
127



128



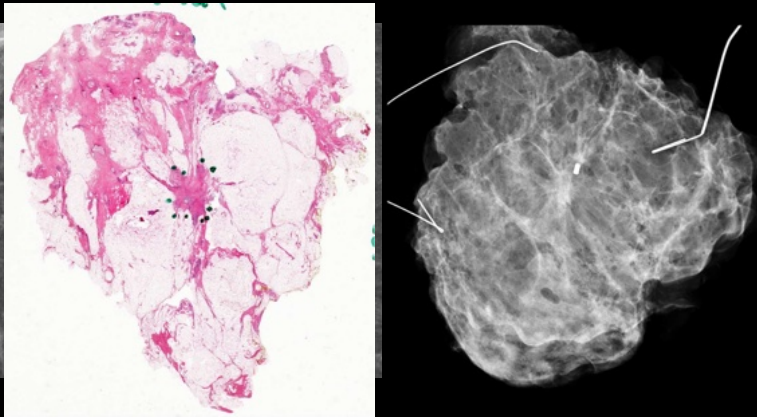
129



130

Histopathology

12x10 mm solitary invasive intralobular BCMO. pN 0/2



131

Follow-up

Nine years and seven months after diagnosis and treatment, the patient is well with no signs of recurrence.



132

Breast imagers' expectations for help from AI when reading mammograms

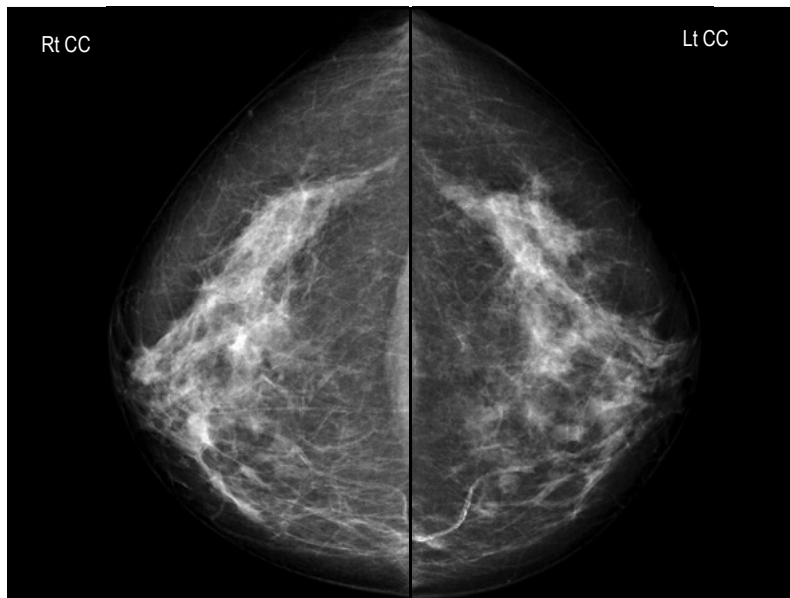


I am truly enthused by the potential benefit of AI, since it may bring breast cancer detection at mammography screening to the same high level everywhere.

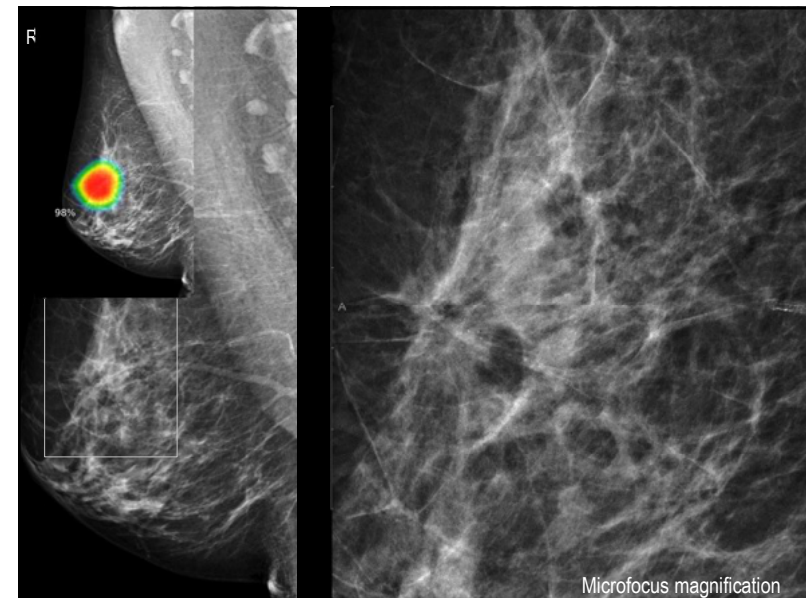
133



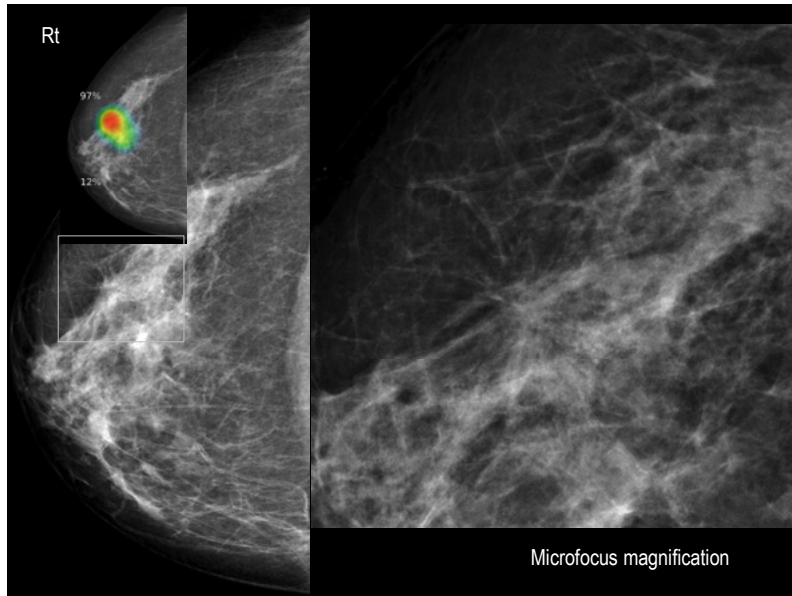
134



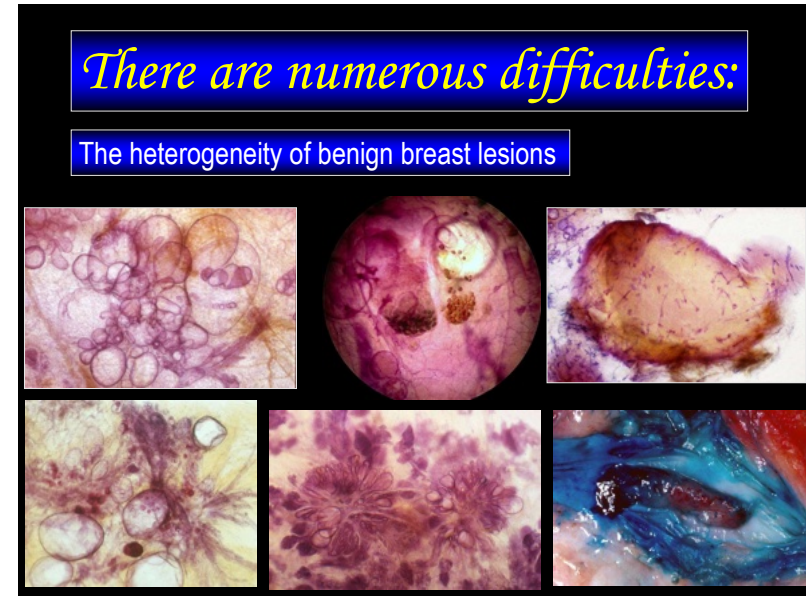
135



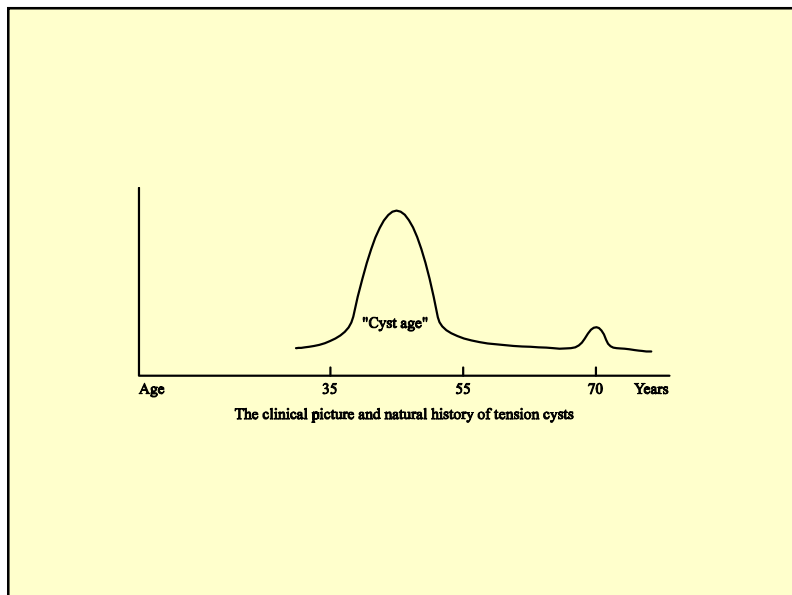
136



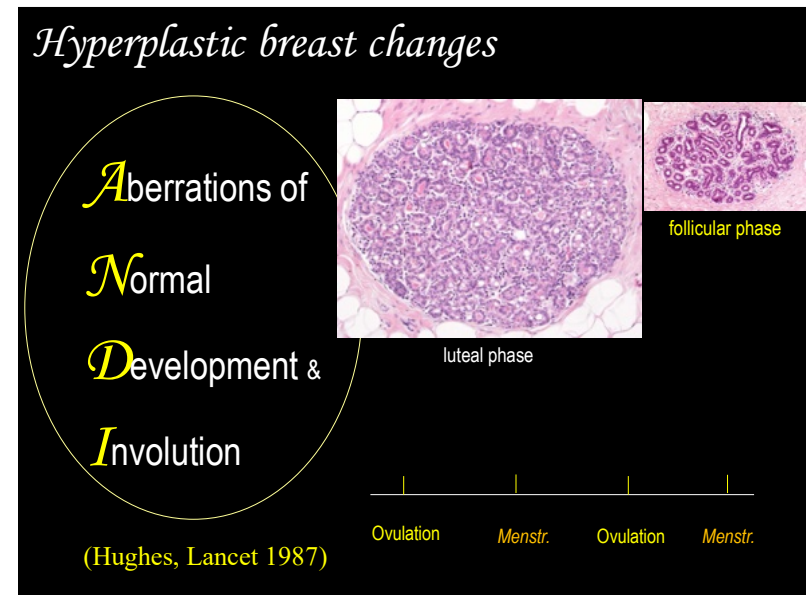
137



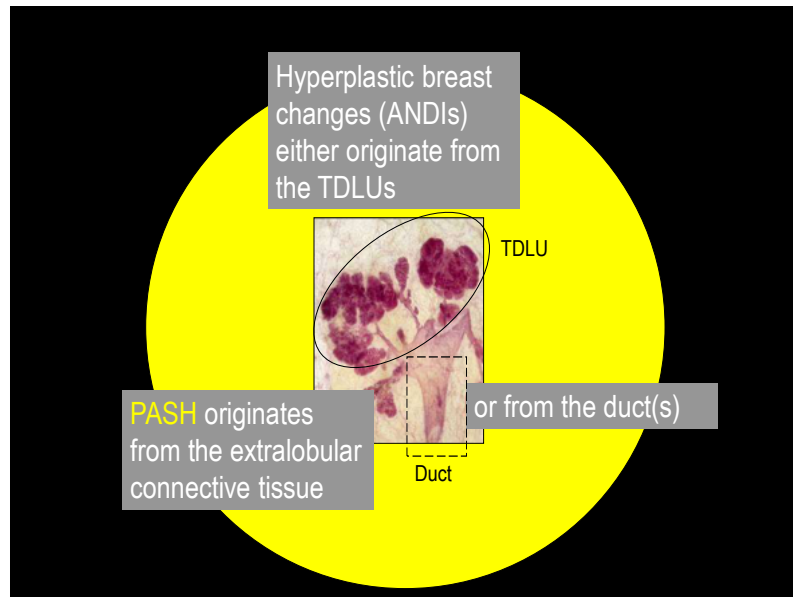
138



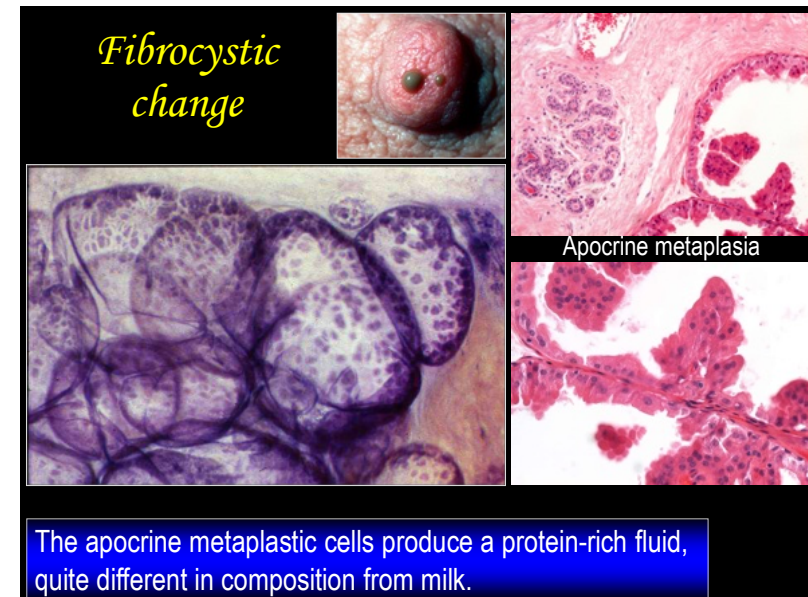
139



140



141



142



143

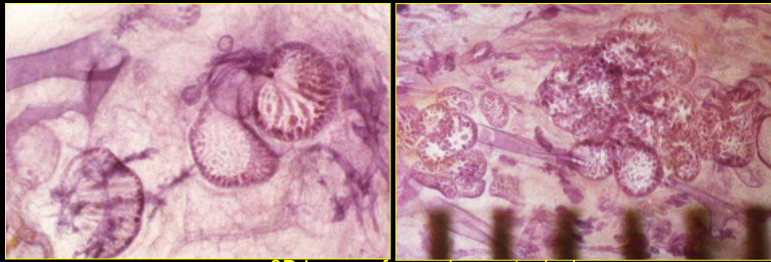
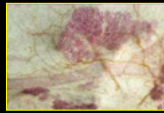


144

Aberrations of Normal Development and Involution ("ANDI")

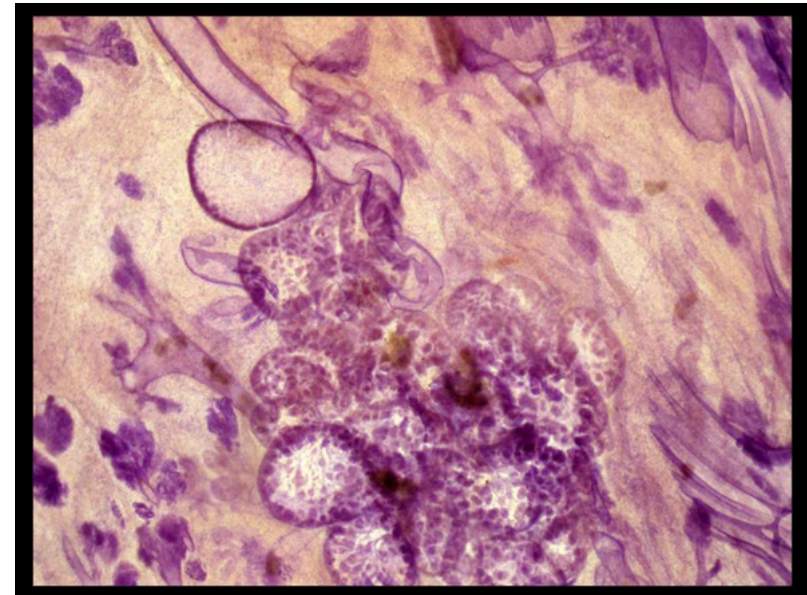
1) Excess amount of fluid produced

a) Fibrocystic change, cysts

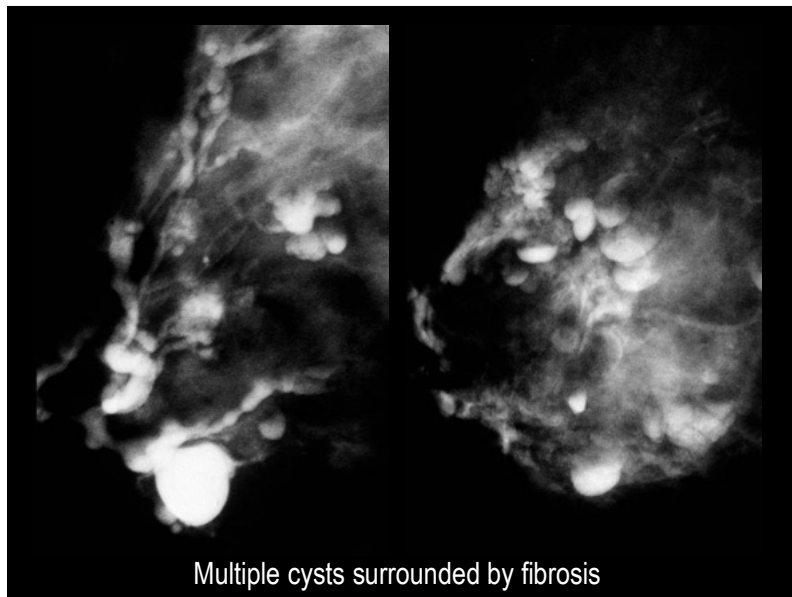


3D image of apocrine metaplasia

145

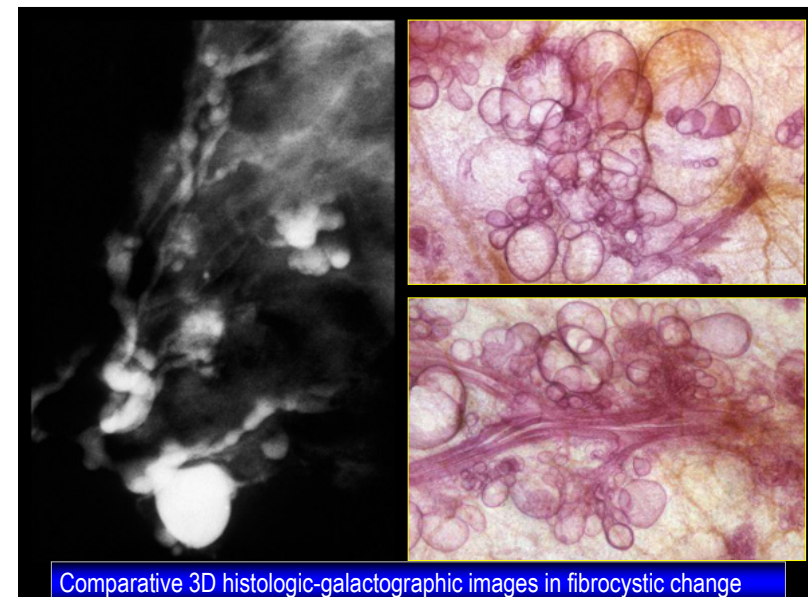


146



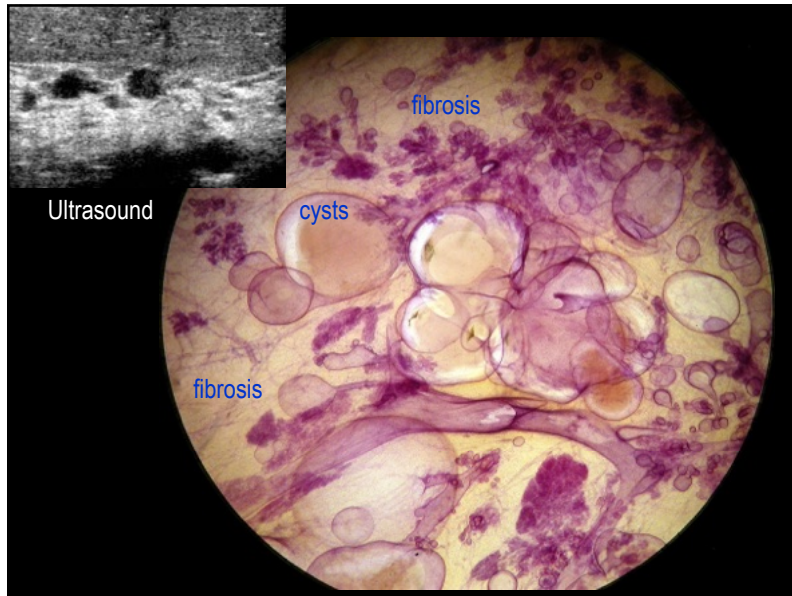
Multiple cysts surrounded by fibrosis

147

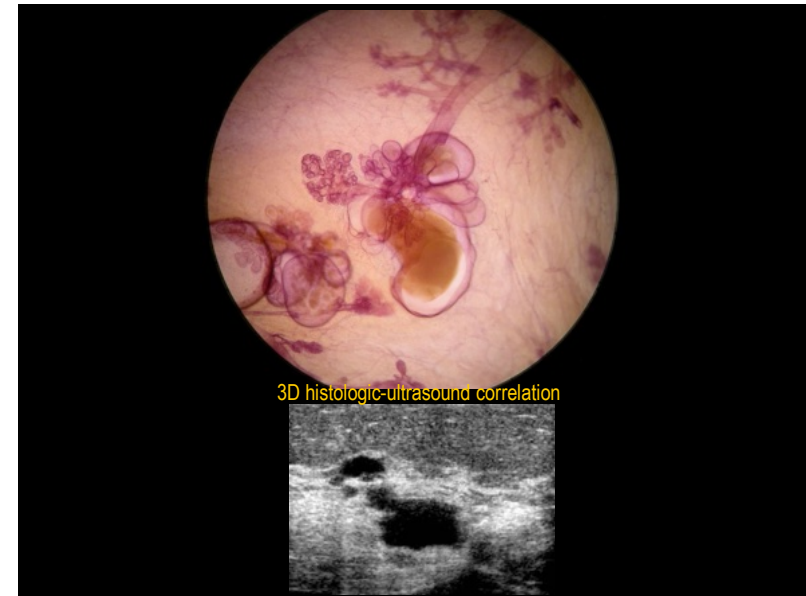


Comparative 3D histologic-galactographic images in fibrocystic change

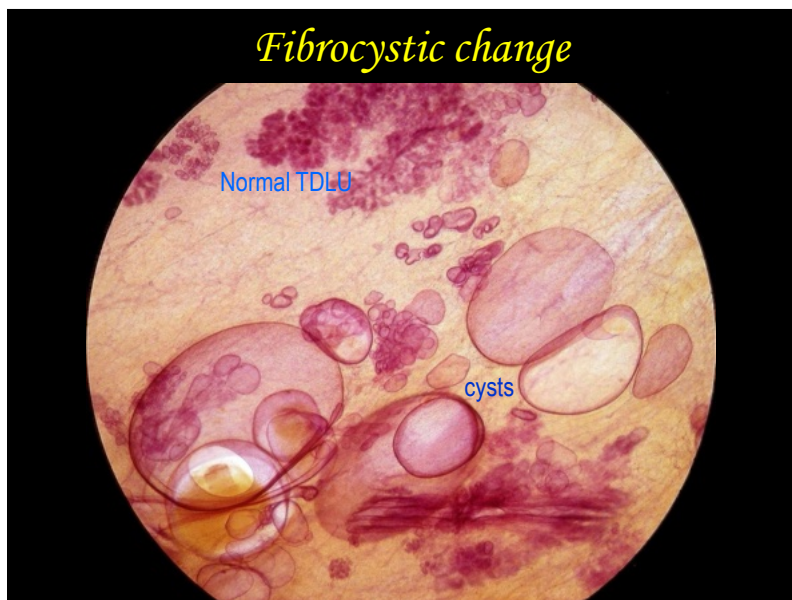
148



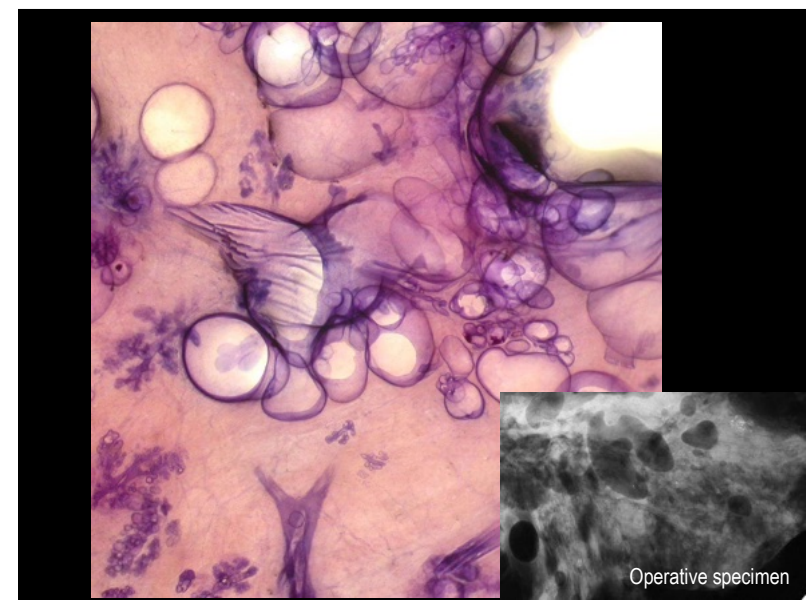
149



150



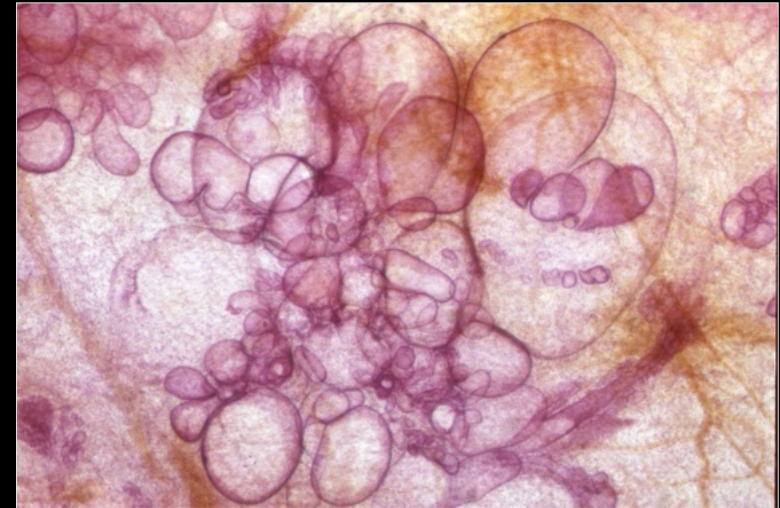
151



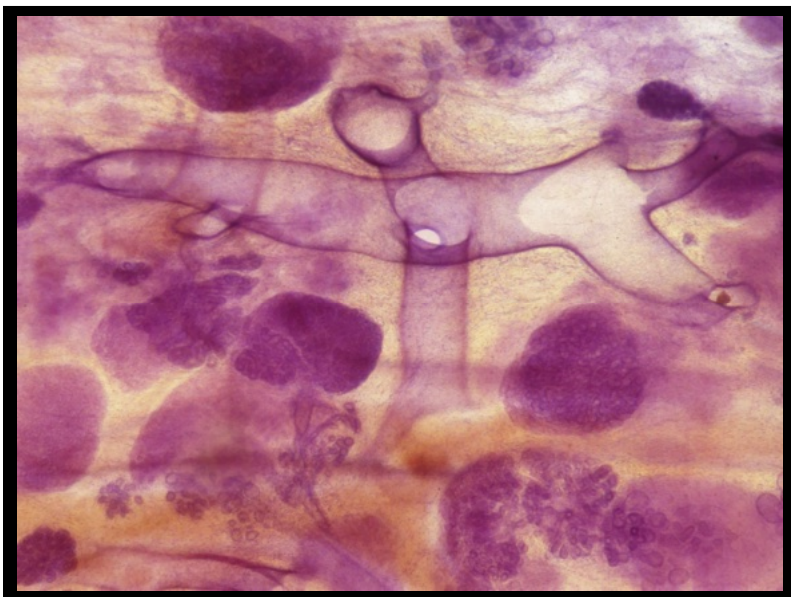
152

Fibrocystic change

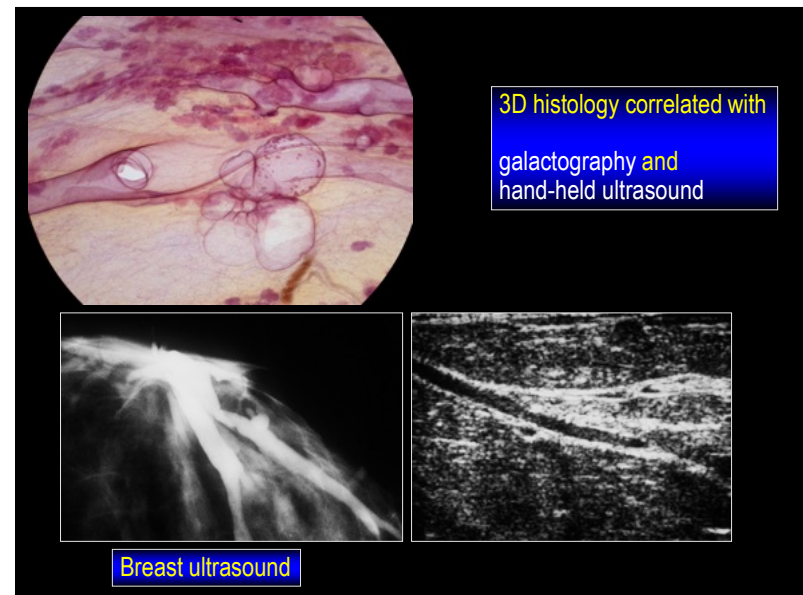
153

Various sizes of cysts in fibrocystic change

154

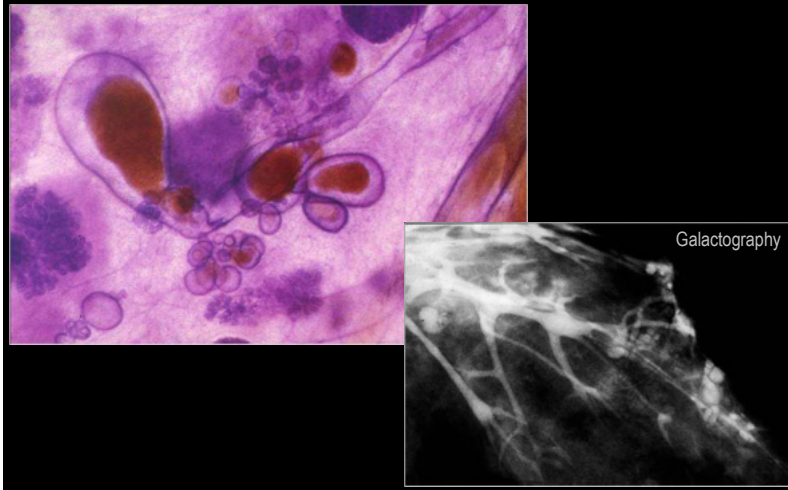


155

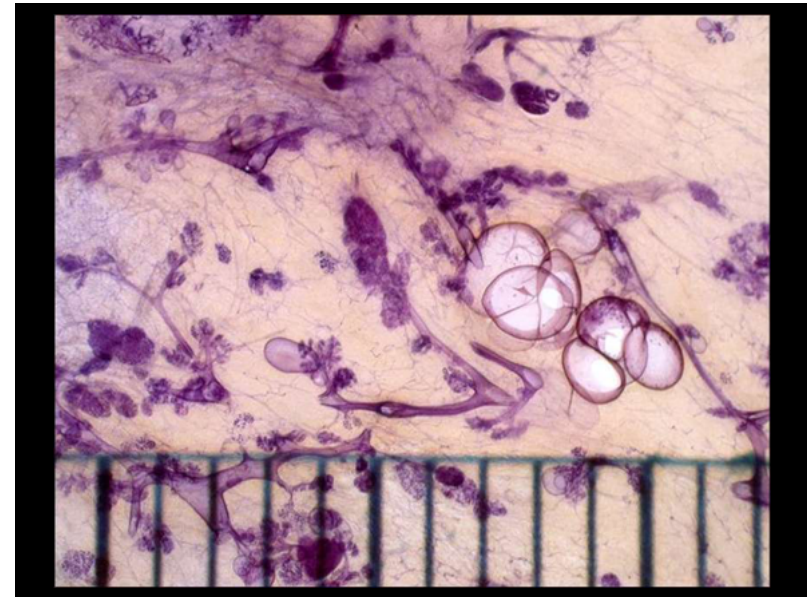


156

Fibrocystic change



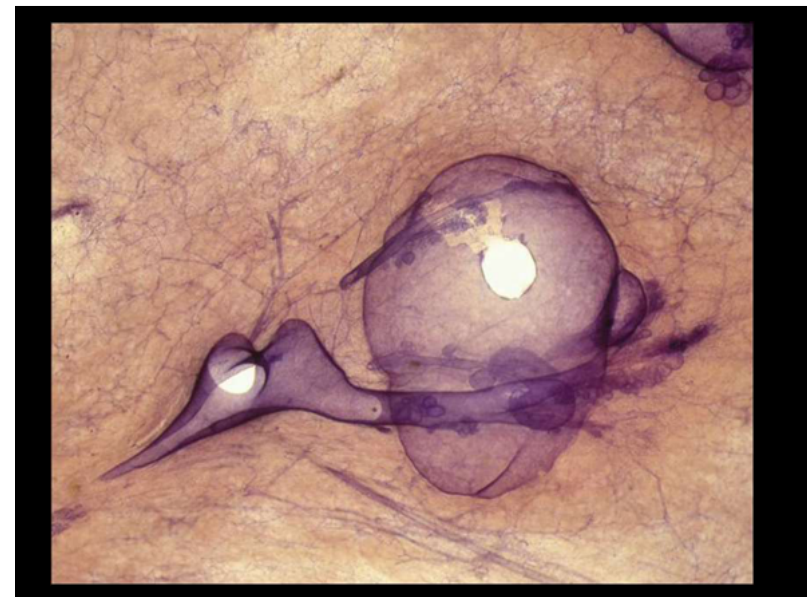
157



158



159



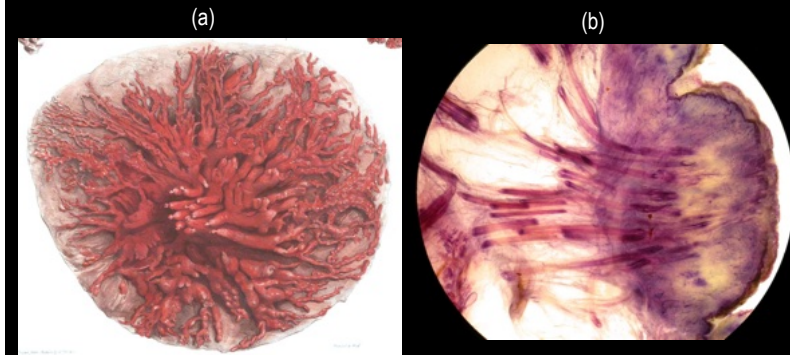
160

Demonstration of

- Normal ducts
- Dilated, fluid-filled ducts, ductectasia
- Cancer of ductal origin (DAB)

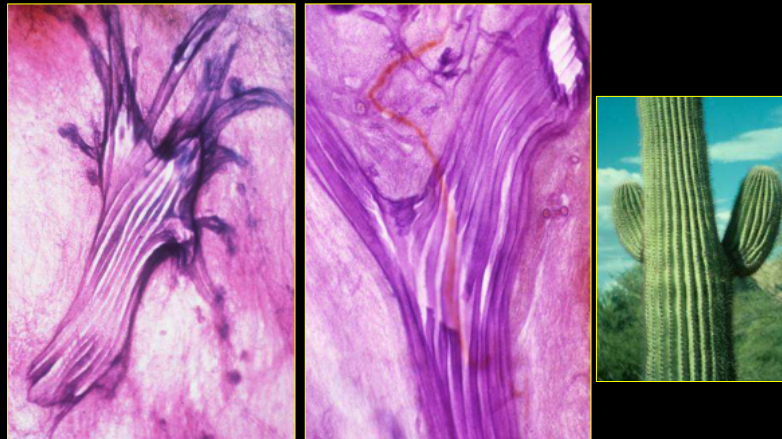
161

12-18 lobes



The 12-18 breast lobes have their own individual openings on the nipple surface. Preparation of Cooper (a) and thick section histology image in cross section showing the ducts within and behind the nipple (b).

162



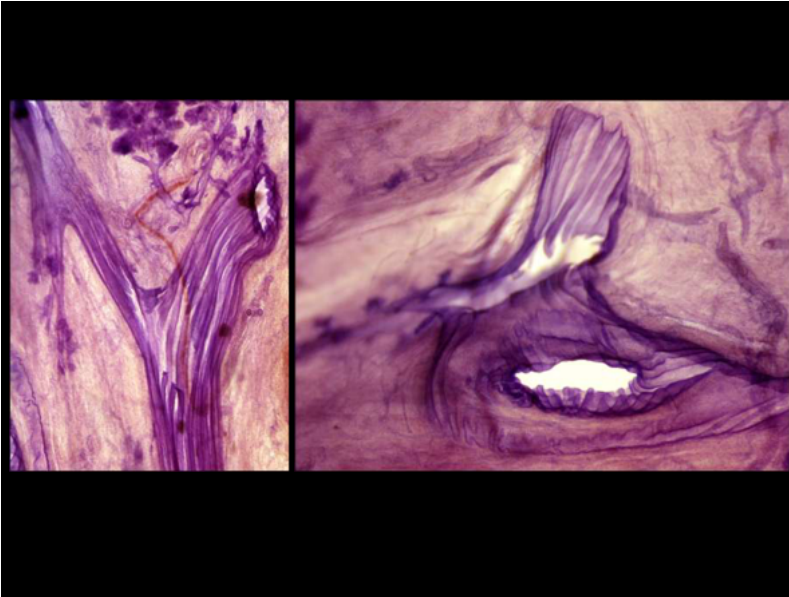
The major ducts are pleated . There is a slight twist on the pleated pattern.

163

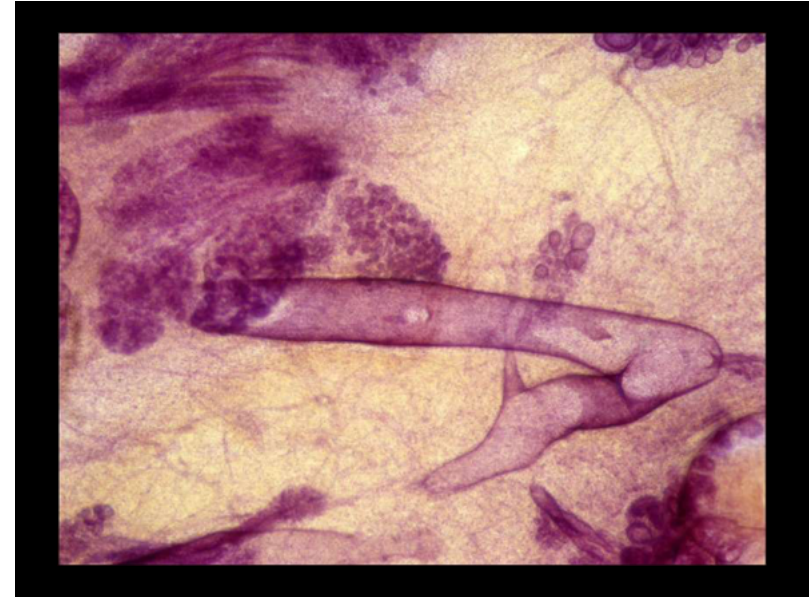


The pleats follow the twists in the major ducts.

164



165



166



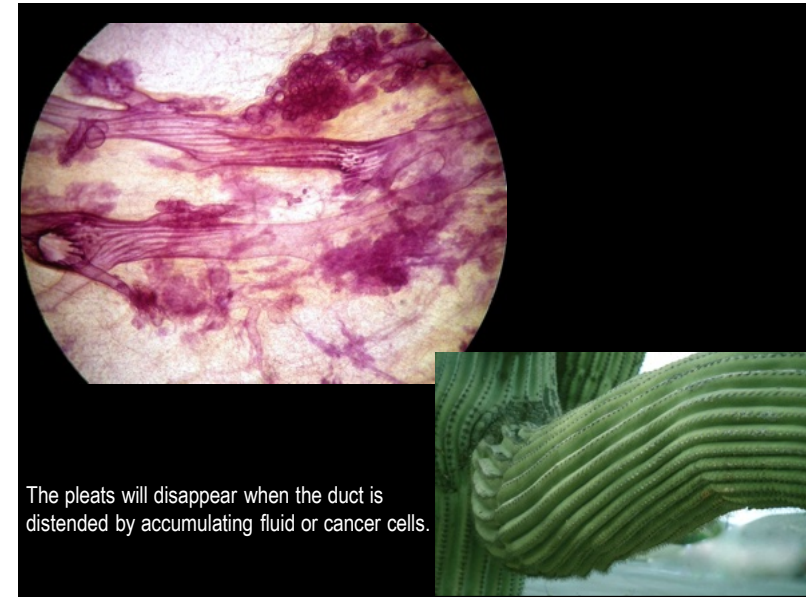
167



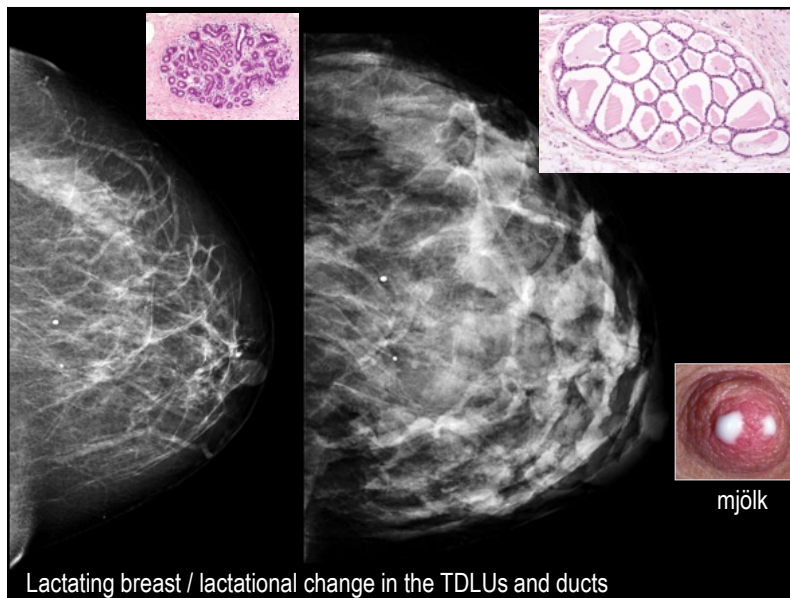
168



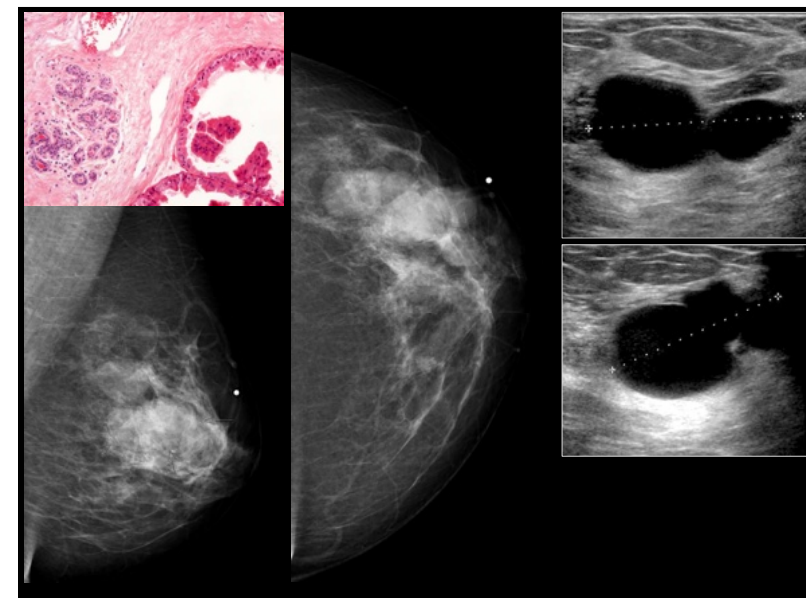
169



170



171



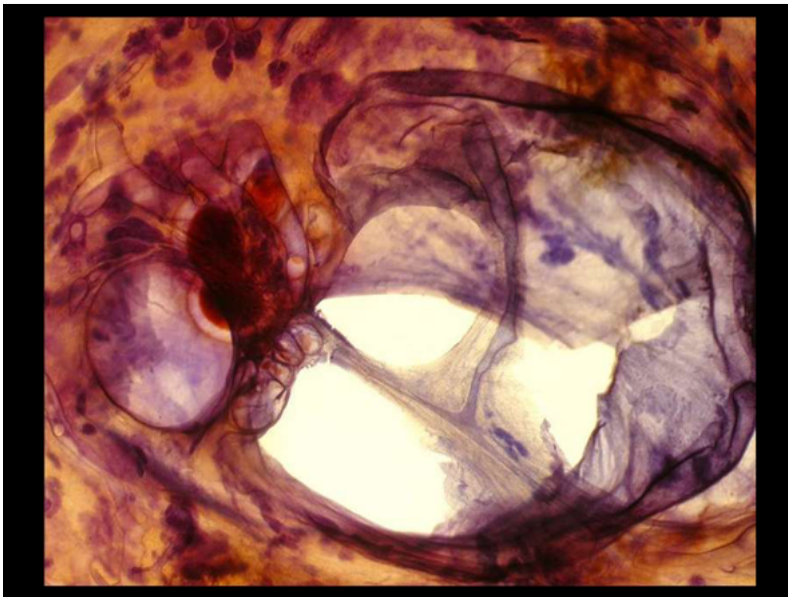
172

Breast cysts

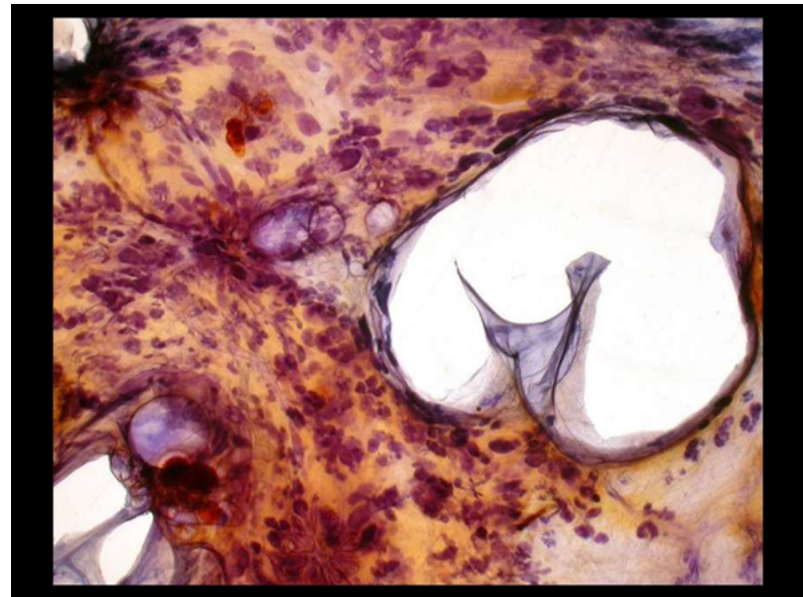
173



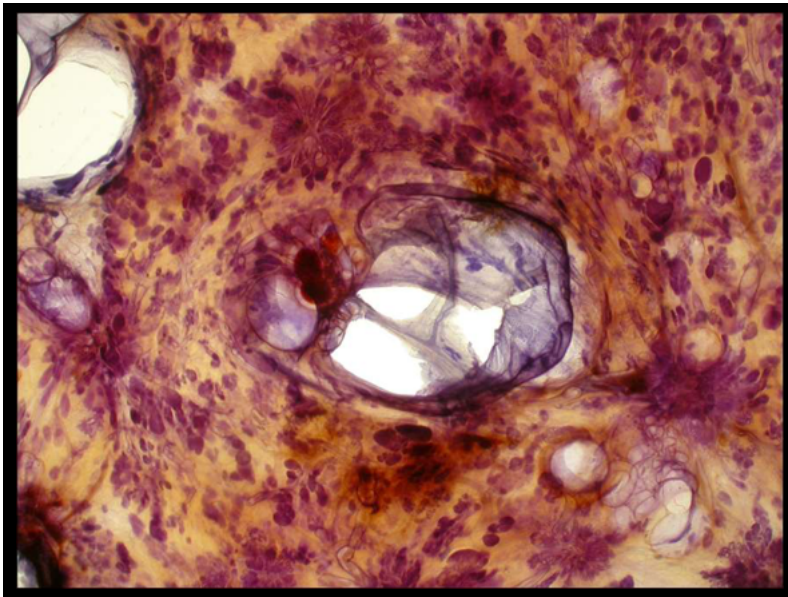
174



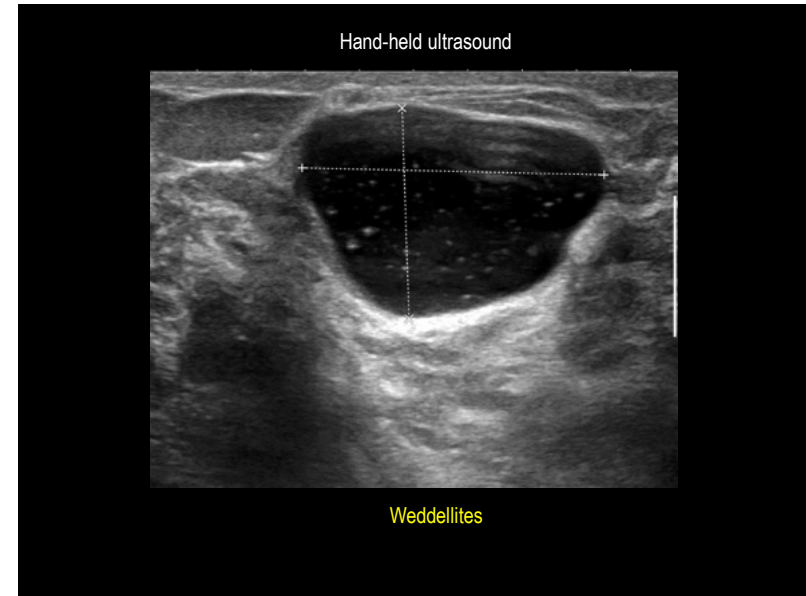
175



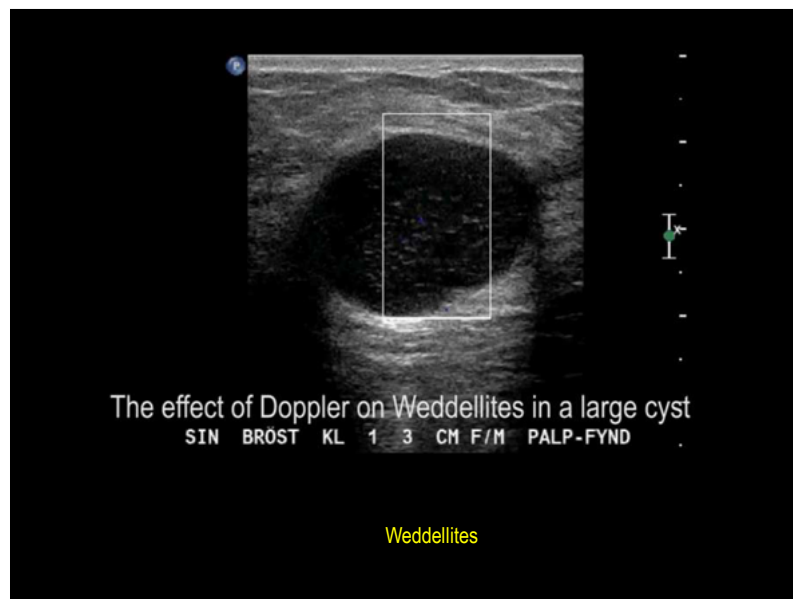
176



177



178



179



180

Nipple discharge of the breast.



Bologna, Italy

181

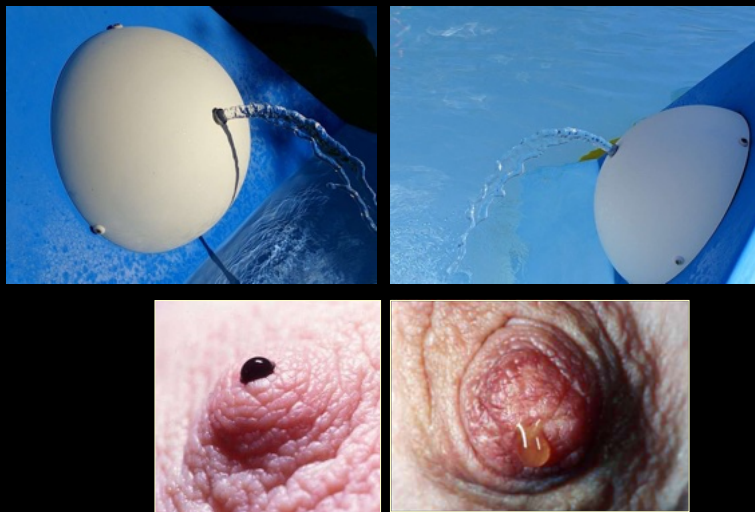


Lack of indication for galactography



Milky or turbid / cloudy discharge from multiple openings on the nipple.

182



183

Indication for galactography



Bloody nipple discharge



Cancer is the
underlying cause:

13%

184

Indication for galactography

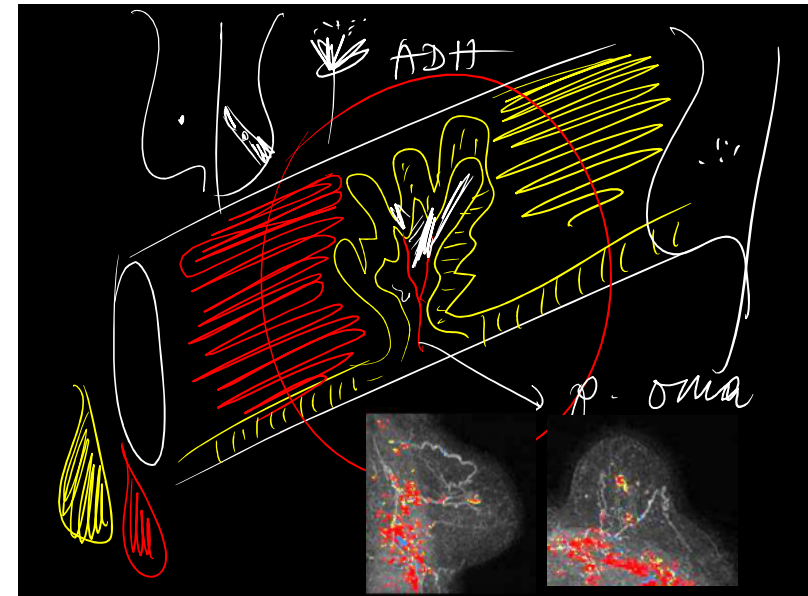


Serous nipple discharge



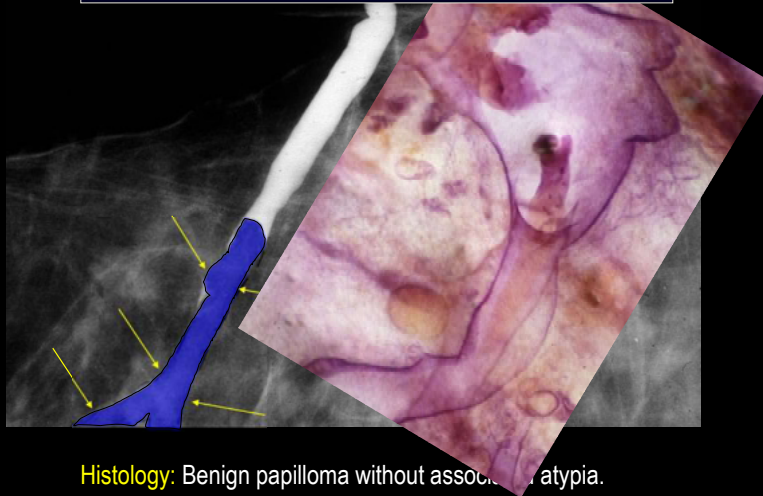
Cancer is the
underlying cause:
7 %

185



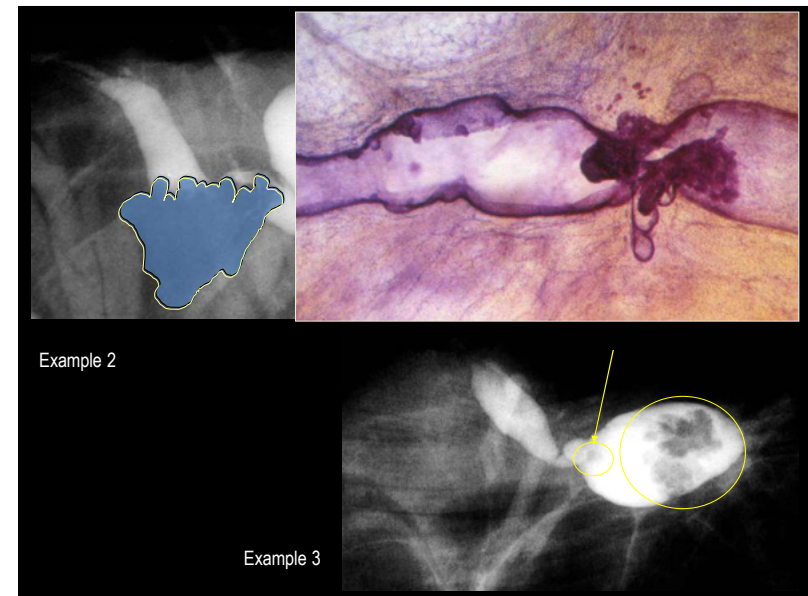
186

The procedure of choice is: *Galactography*
Benign, intraductal papilloma cases

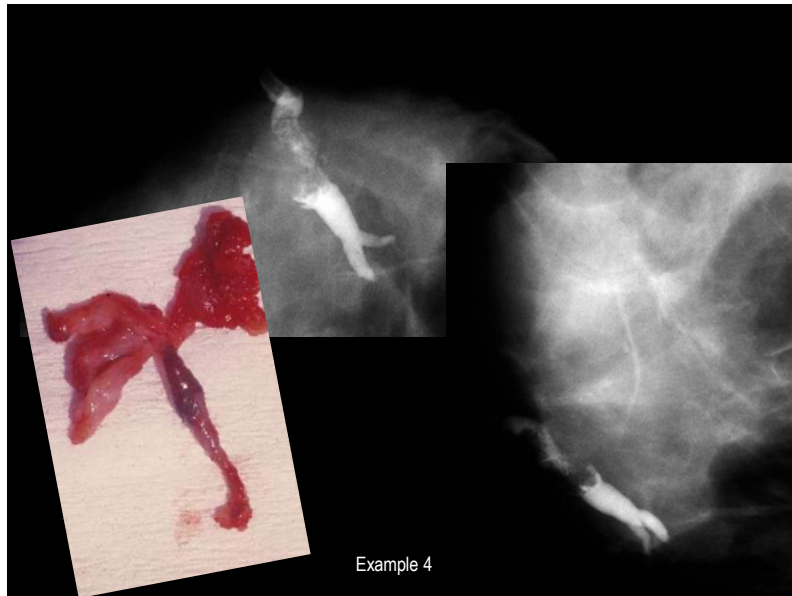


Histology: Benign papilloma without associated atypia.

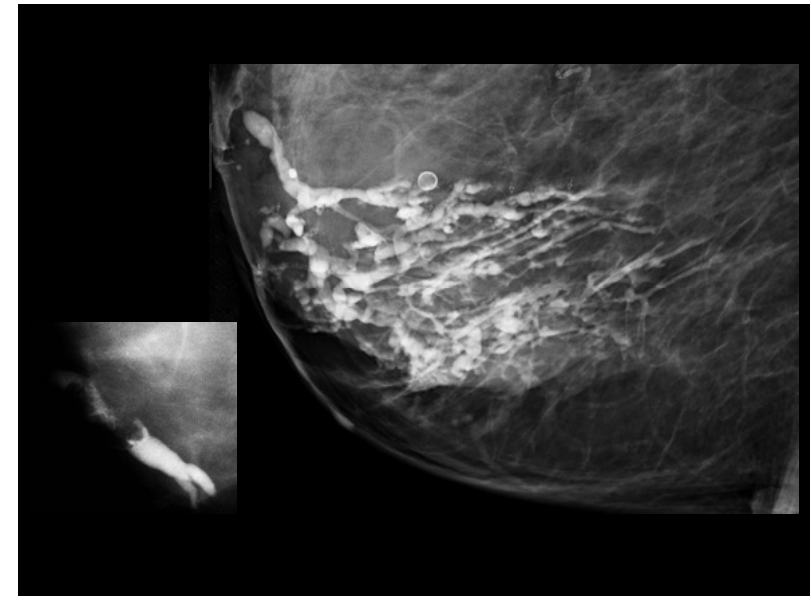
187



188



189

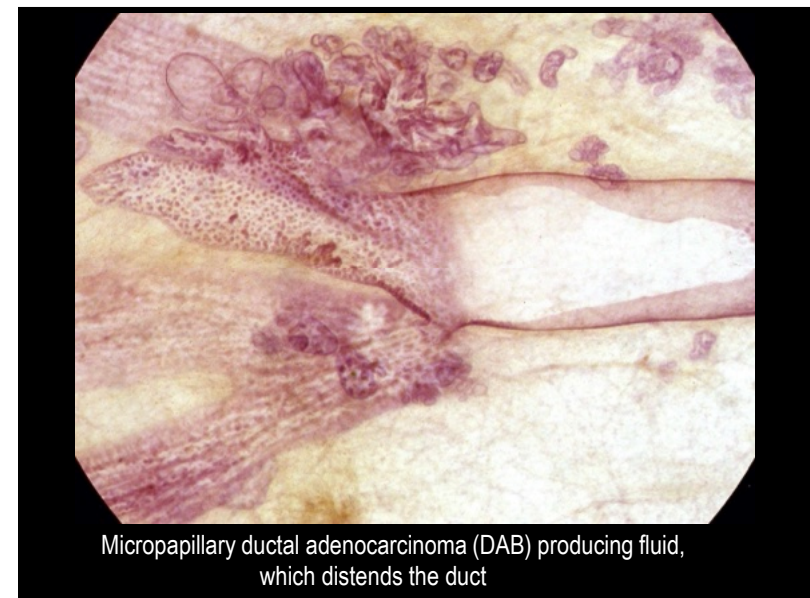


190



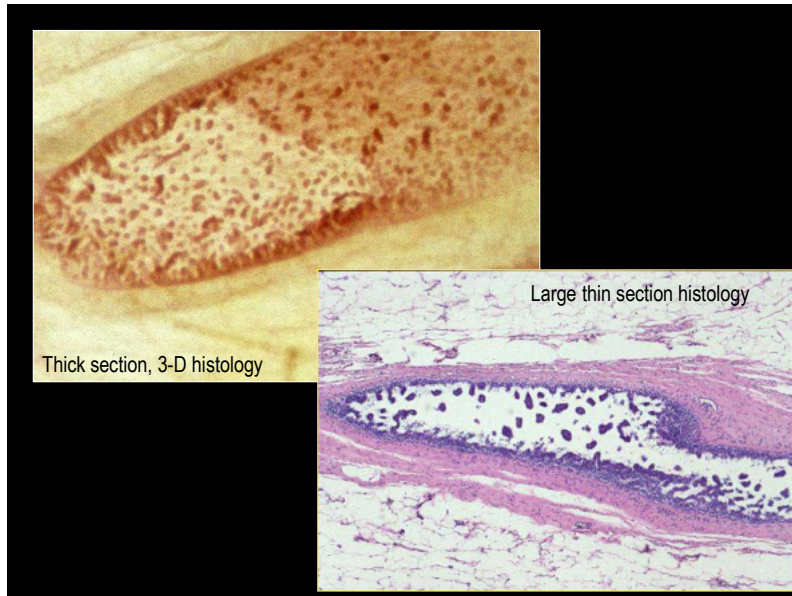
Micropapillary fluid-producing carcinoma (DAB) in a major duct

191



Micropapillary ductal adenocarcinoma (DAB) producing fluid, which distends the duct

192



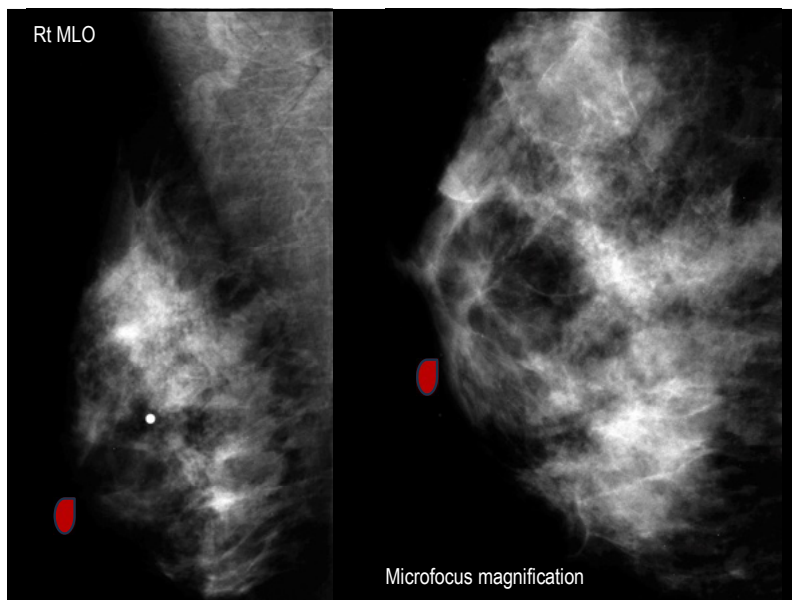
193

45-year-old woman, felt a thickening in the lower-lateral portion of her right breast. Also, she had **bloody nipple discharge** from the right nipple.

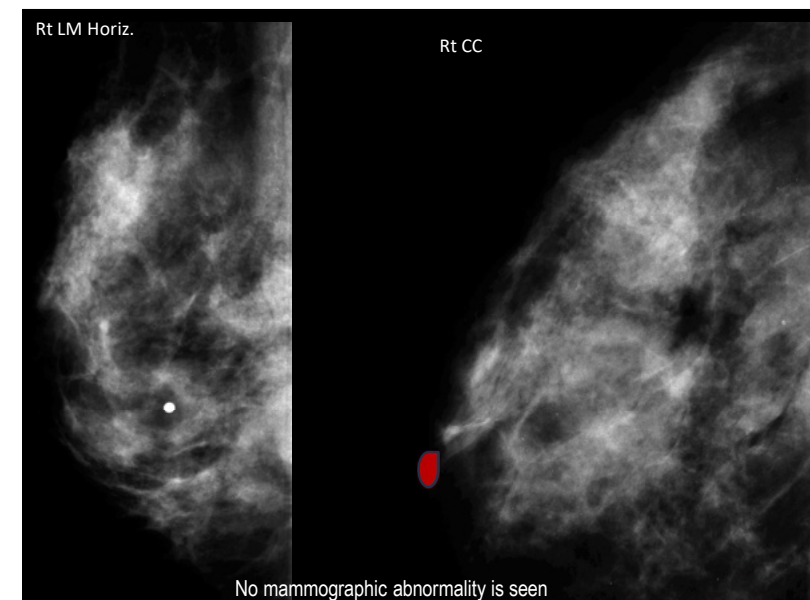


From the Departments of Mammography
Surgery and Clinical Pathology
Falun Central Hospital, Sweden ©

194



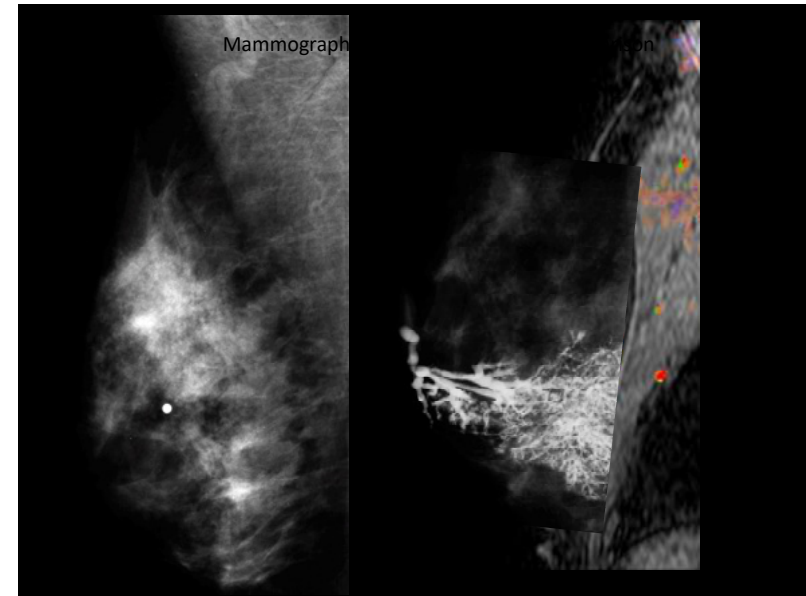
195



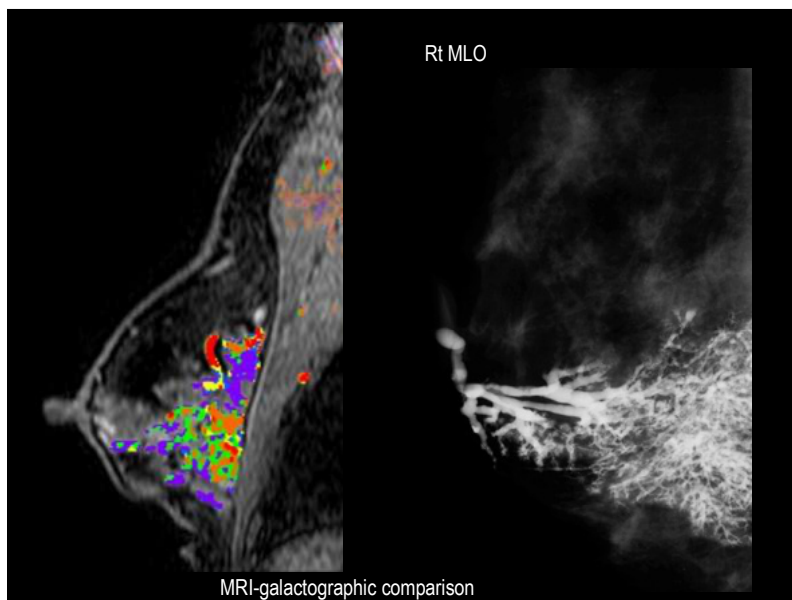
196



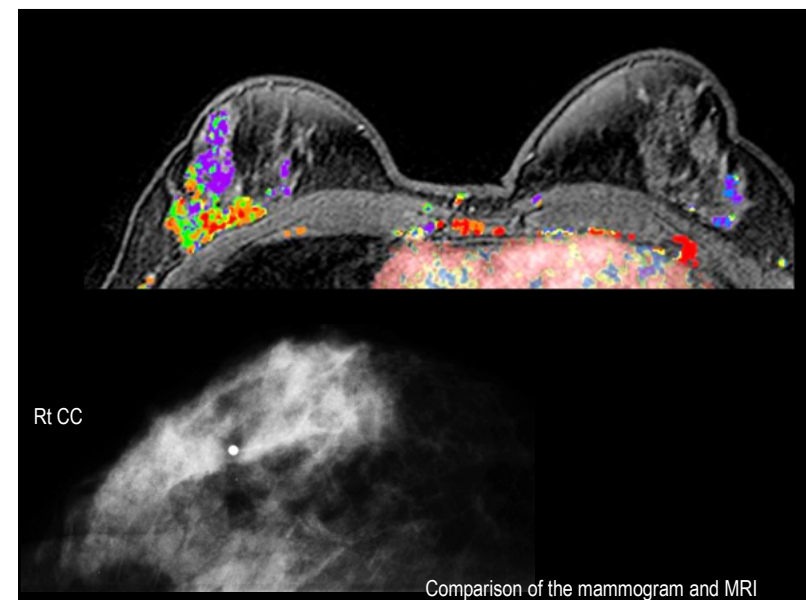
197



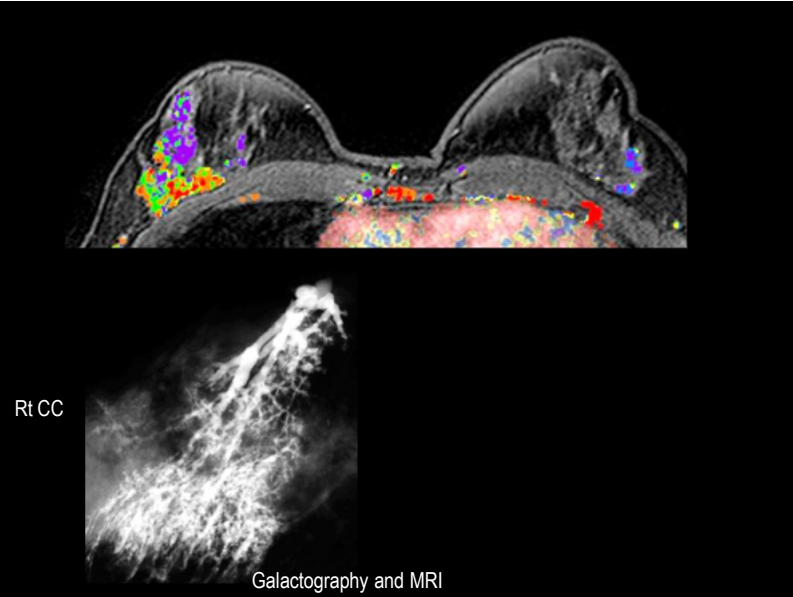
198



199



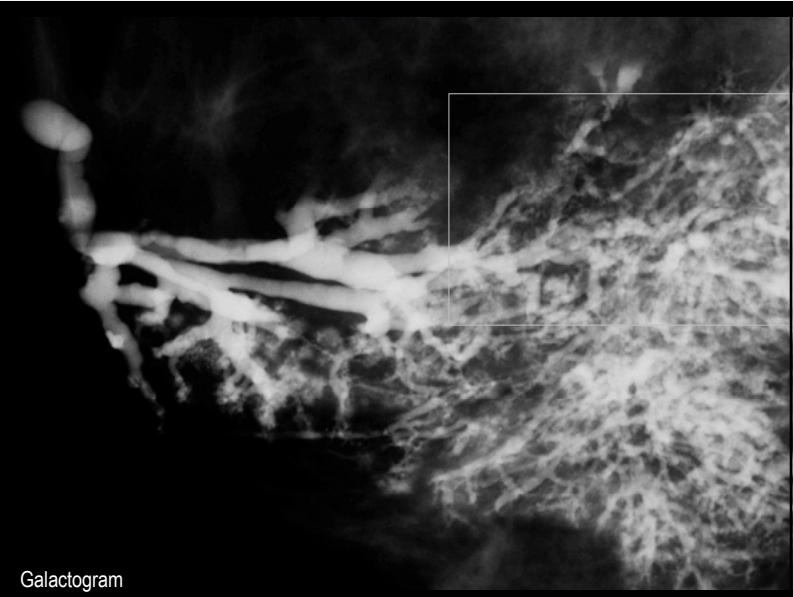
200



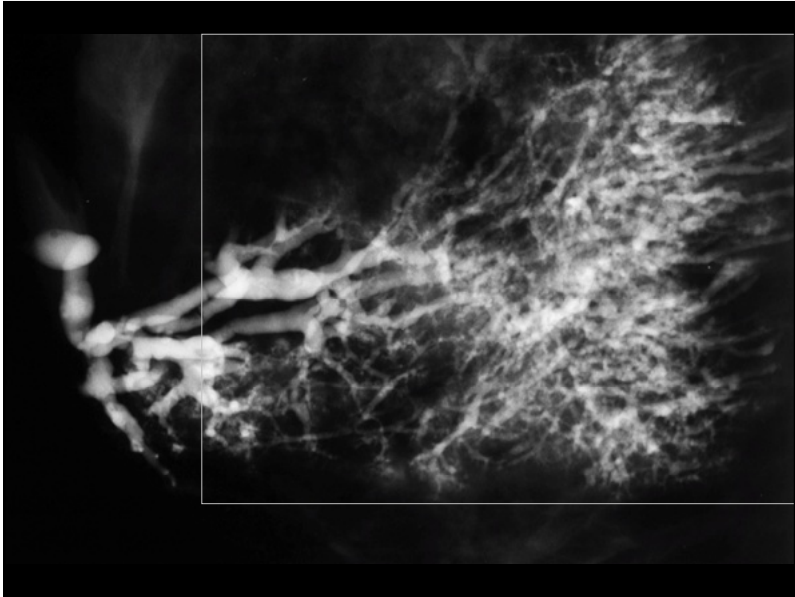
201



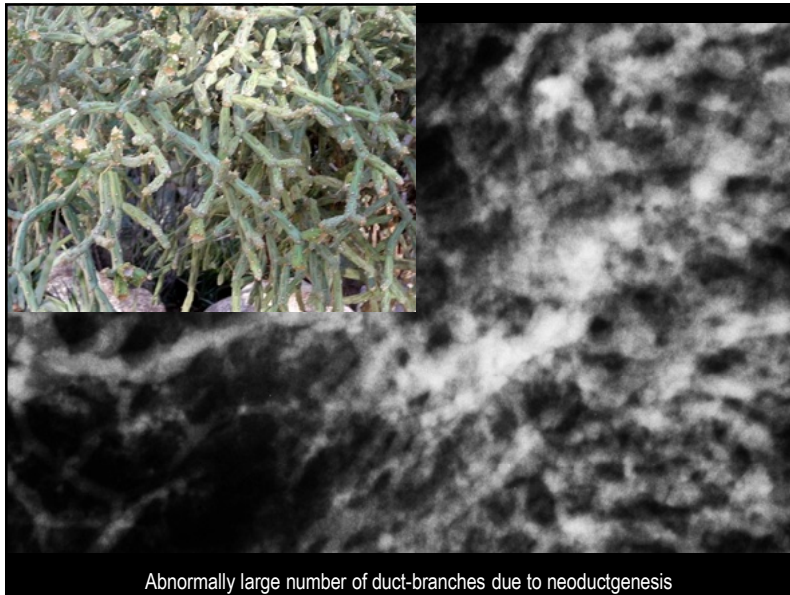
202



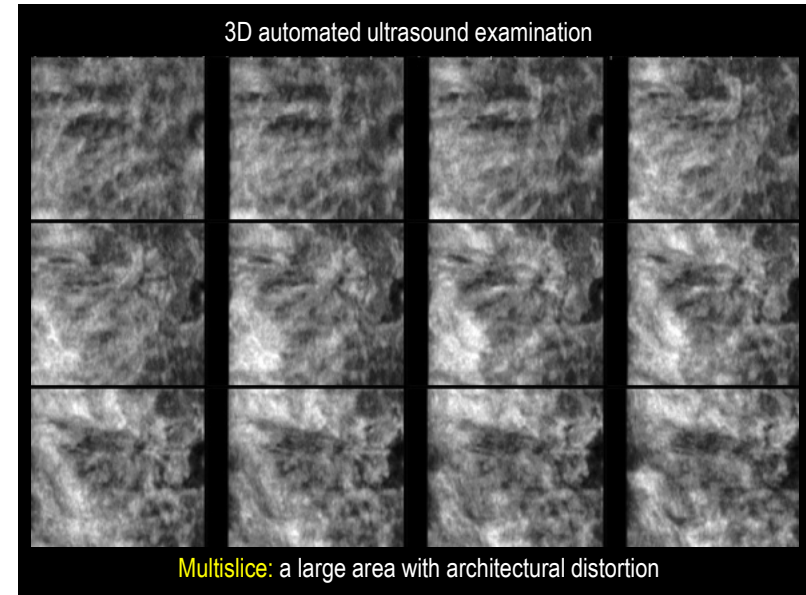
203



204



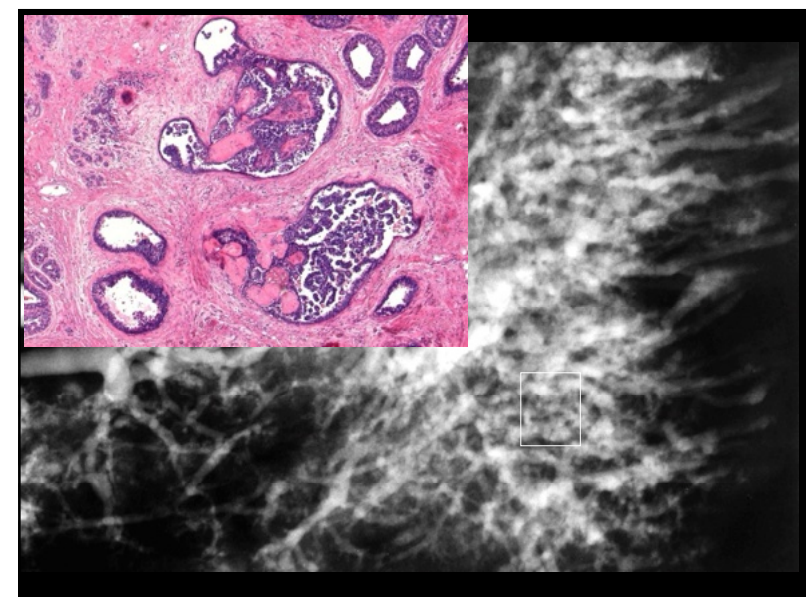
205



206



207



208



209