

BI-RADS

Breast Imaging Reporting and Data System

Ats Vare

II a radiologia resident



Breast Imaging Reporting and Data System

American College of Radiology

Esimene väljaanne 1993. a → viies väljaanne 2013. a

Mammograafia / ultraheli / magnetresonantstomograafia

Eesmärgid:

- Uuringute kirjeldamise standardiseerimine
- Ühtse leksikoni rakendamine
- Klinitistidega suhtlemise hõlbustamine
- Tulemuste jälgimise hõlbustamine

Uuringu näidustus

- Sõeluuring / diagnostiline / jälgimine

Rindade struktuur

Oluliste leidude kirjeldus

- Mass
- Lubjastused
- Strooma deformatsioonid
- Asümmeetriad

Võrdlus varasemate uuringutega

Hinnang

- BI-RADS 0-6

Edasine käsitus

- Tagasikutse / jälgimine / biopsia / ...

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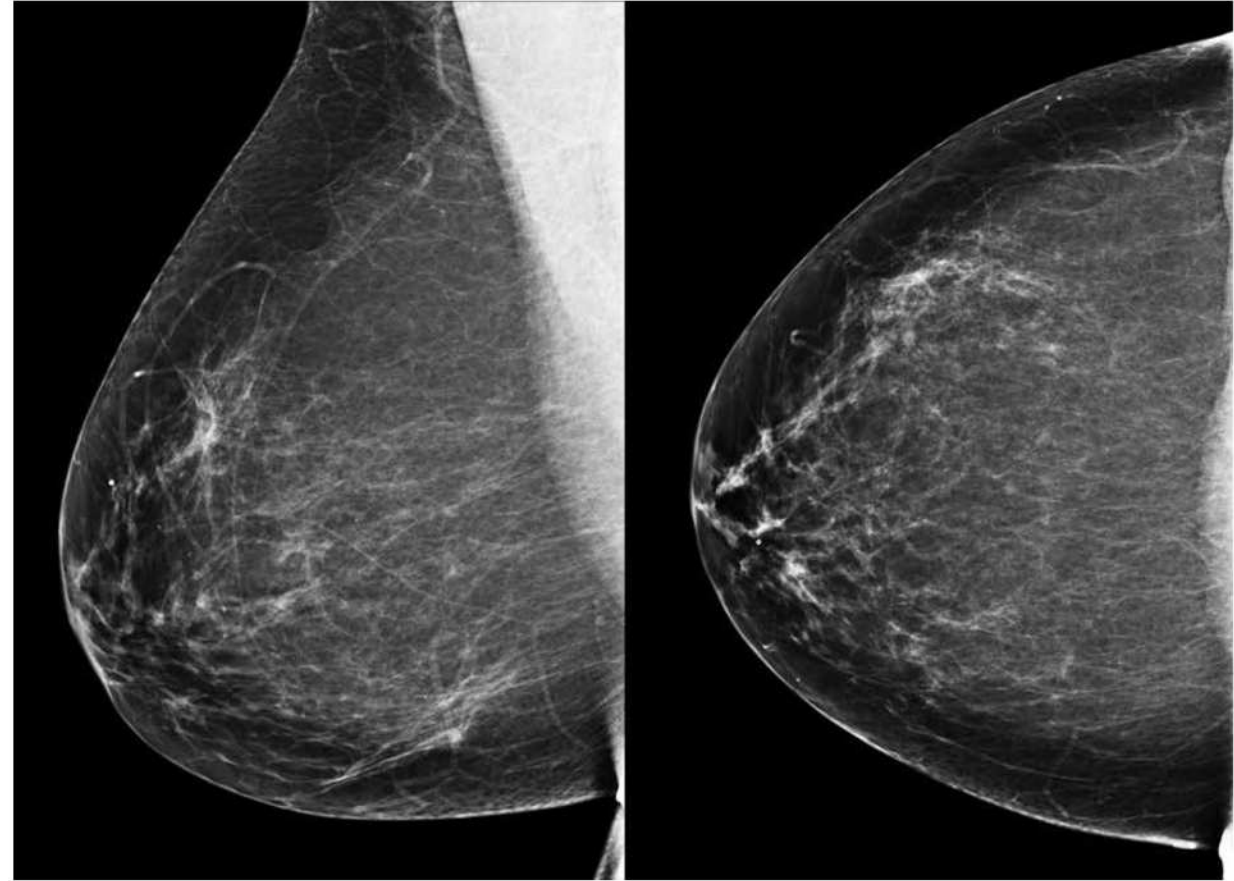
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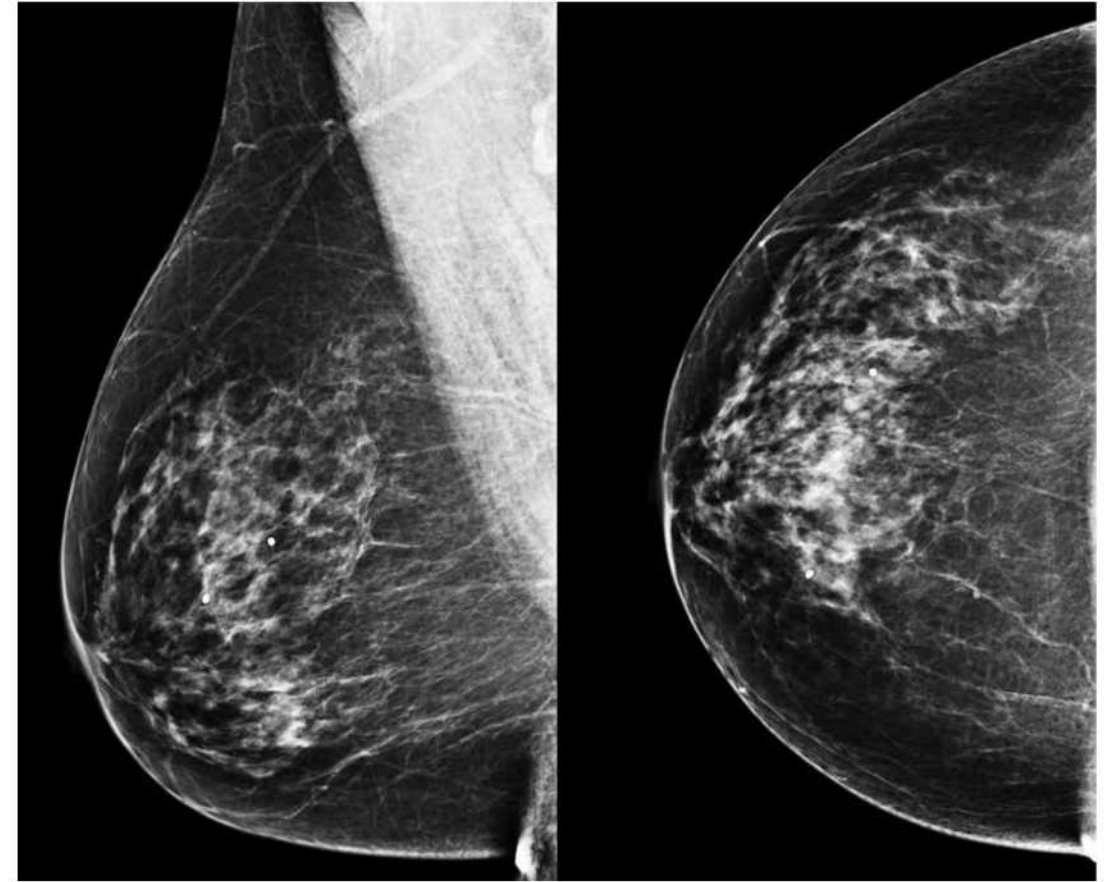
Rindade struktur

- a. The breasts are almost entirely fatty.*
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- c. The breasts are heterogeneously dense, which may obscure small masses.*
- d. The breasts are extremely dense, which lowers the sensitivity of mammography.*



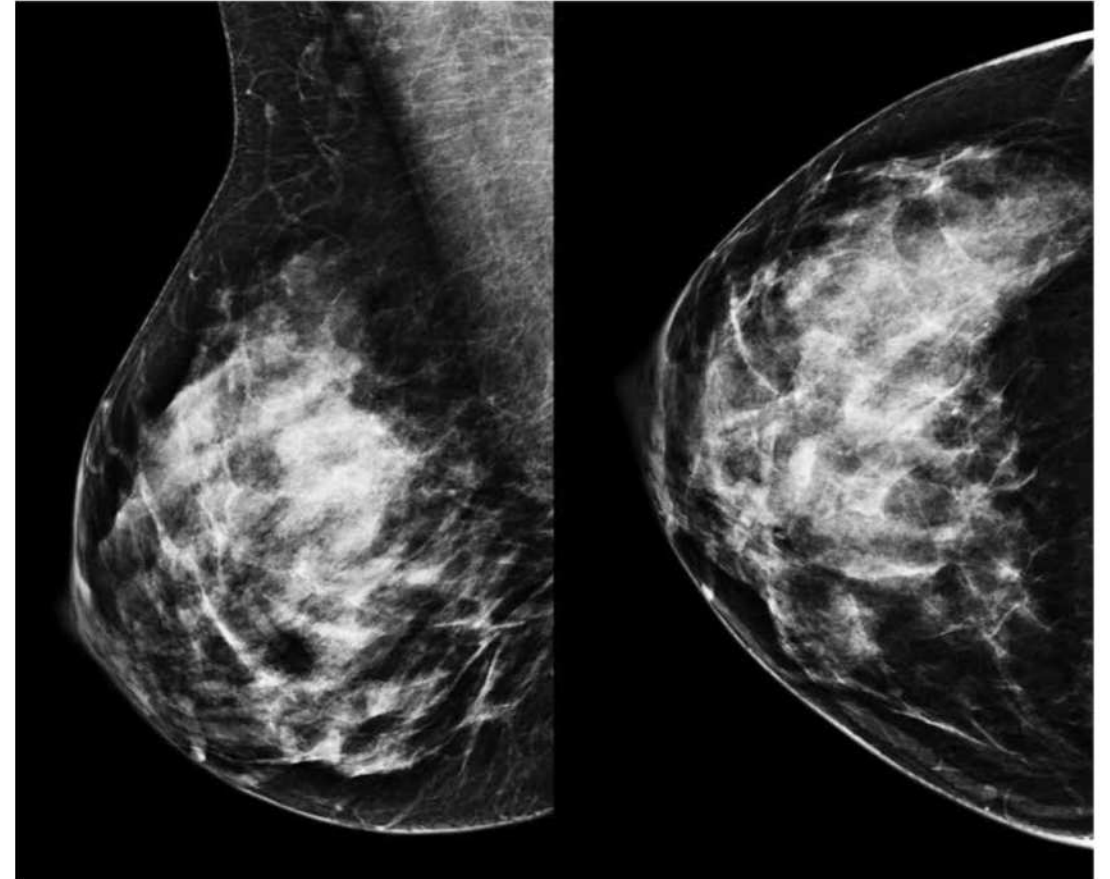
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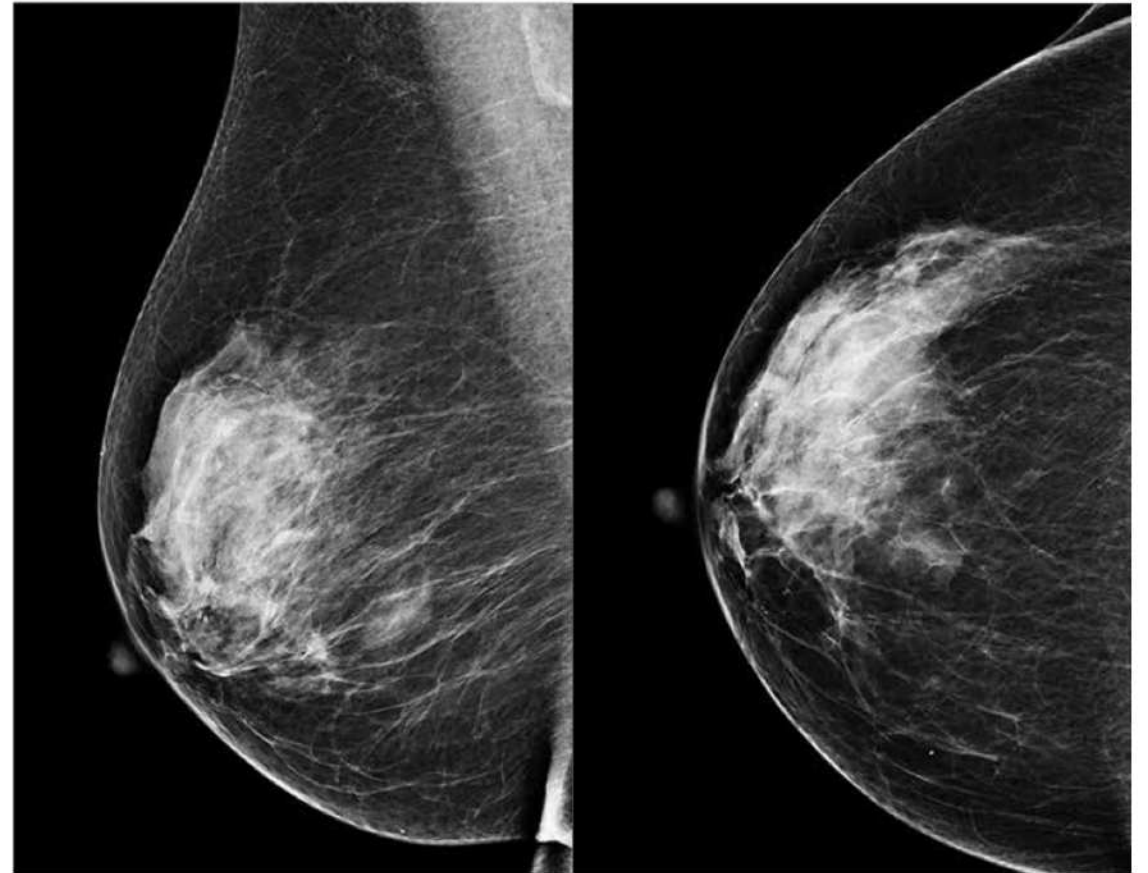
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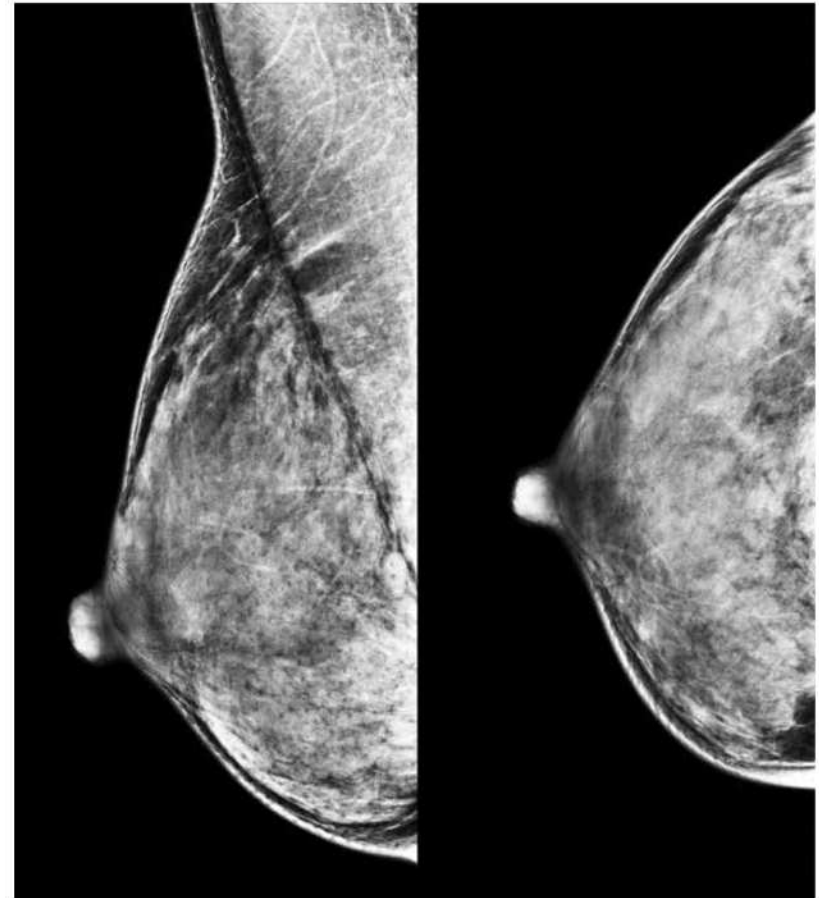
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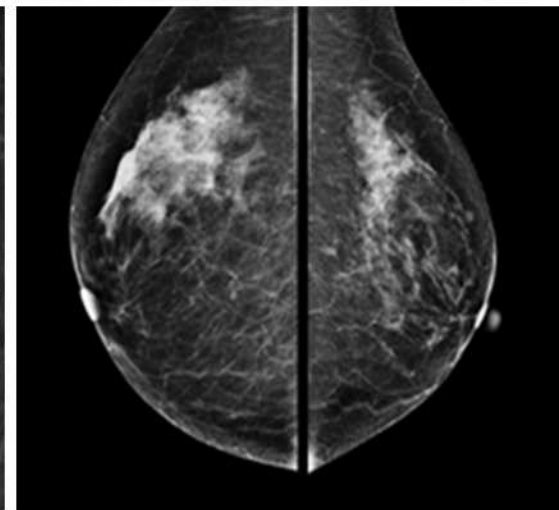
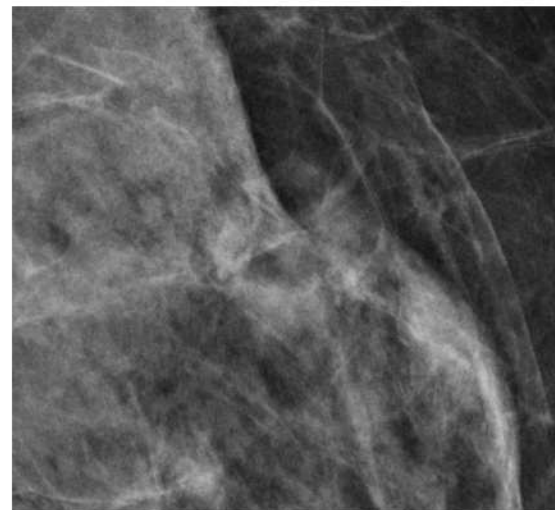
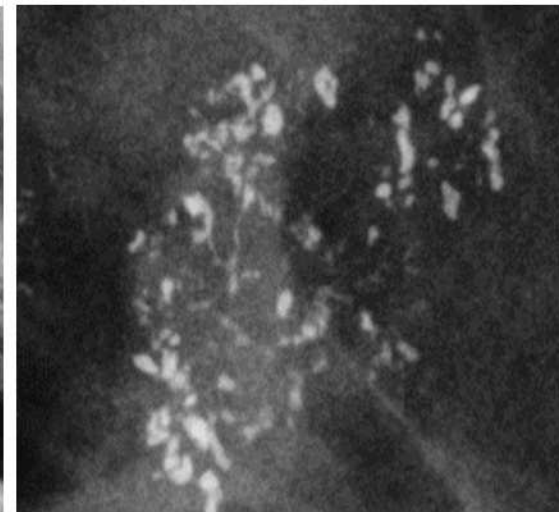
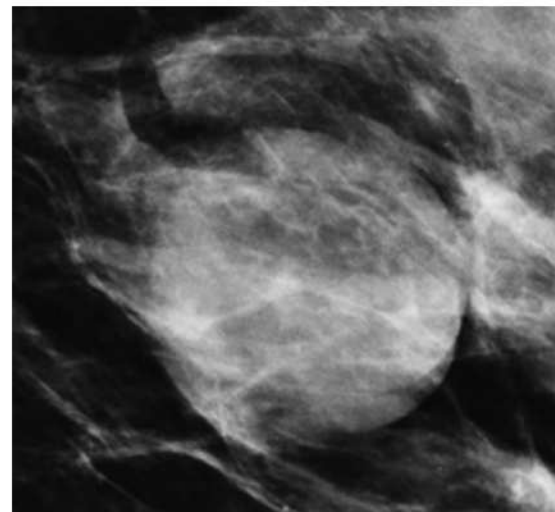
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Edasine käsitus

- Tagasikutse / jälgimine / biopsia / ...

Oluliste leidude kirjeldus

- **Mass**
 - **Lubjastused**
 - **Strooma deformatsioon**
 - **Asümmeetriad**
-
- Intramammaarne lümfisõlm
 - Nahalesioon
 - Üksik laienenud piimajuha



Mass

- + Massiga seotud lubjastused
- + Strooma deformatsioon, turse; piimajuhade muutused; naha paksenemine ja/või rektratsioon

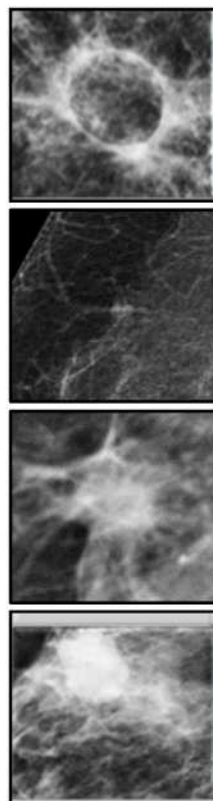
- **Lokalisatsioon**

- Lateraalsus
- Kvadrant / kellaosuti suund
- Sügavus
- Kaugus nibust

- **Suurus**

- **Tihedus**

- Rasva sisaldav
- Madala tihedusega
- Näärmekoega sarnase tihedusega
- Kõrge tihedusega



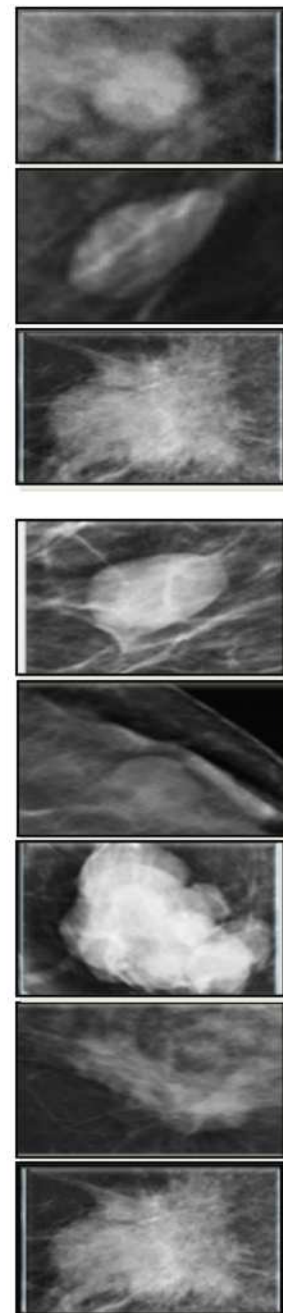
- **Morfoloogia**

- **Kuju**

- Ümar
- Ovaalne
- Ebakorrapärane

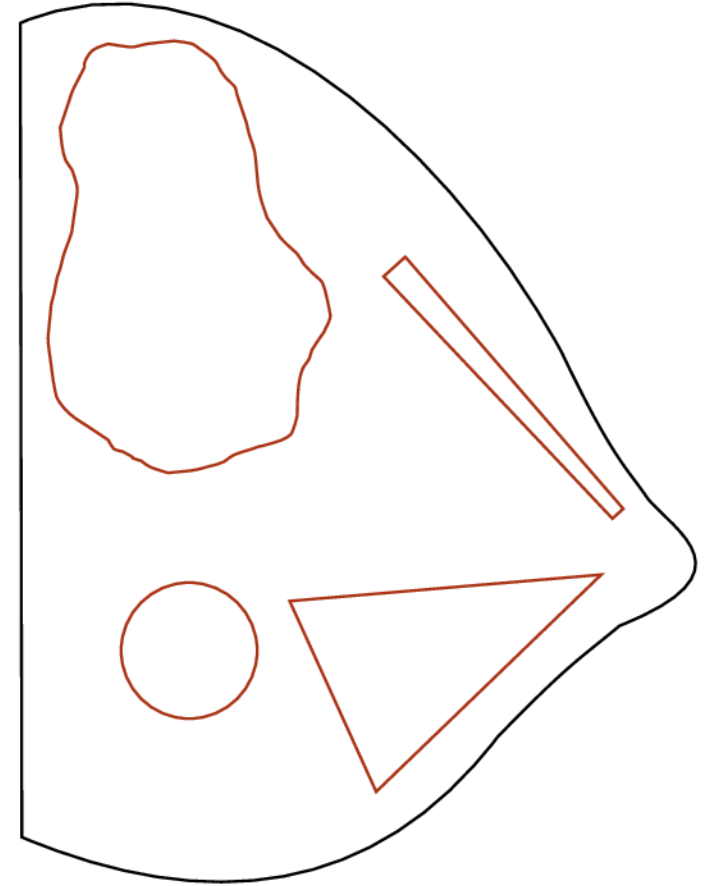
- **Kontuur**

- Piiritletud
- (Osaliselt) varjatud
- Mikrolobulaarne
- Ebaselgelt piirdunud
- Kiirjas



Mikrolubjastuste paiknemine

- **Difuusne**
- **Regionaalne**
 - Hajusalt suurel alal ($> 2\text{cm}^3$) ning mitte juhade kulgu mööda
- **Rühmitatud**
 - ≥ 5 mikrolubjastust väikesel alal (1 cm^3 , max läbimõõt 2 cm)
- **Lineaarne**
- **Segmentaalne**
 - Mikrolubjastuste paiknemine juhade kulgu mööda

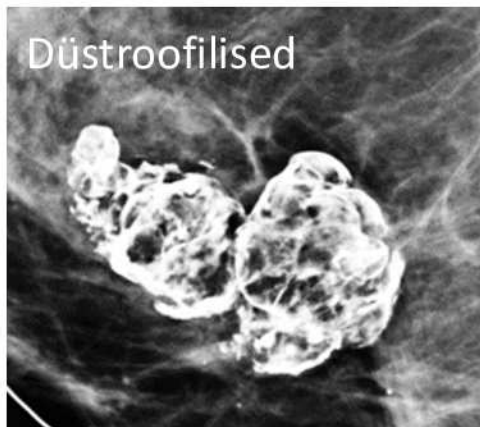


Beniigsed mikrolubjastused

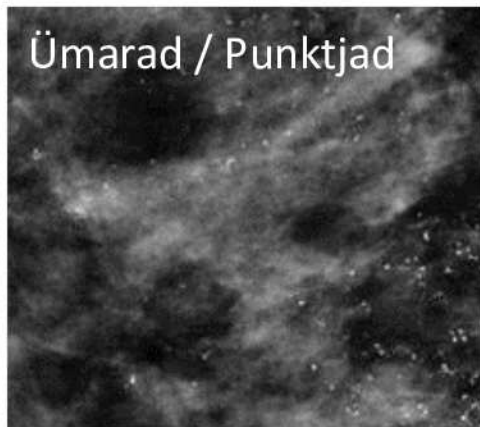
Dermaalsed



Düstroofilised



Ümarad / Punktjad



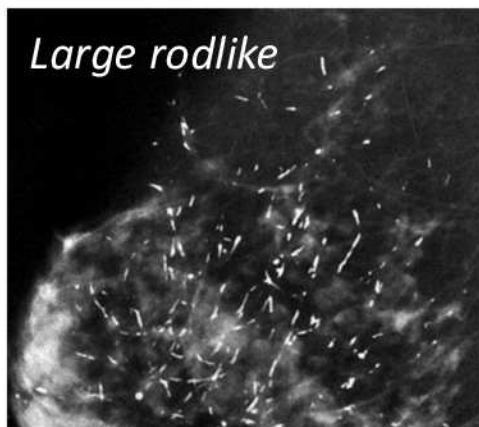
Vaskulaarsed



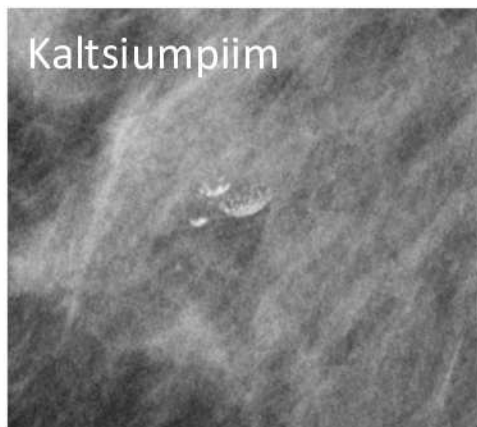
Popkorn-tüüpi



Large rodlike



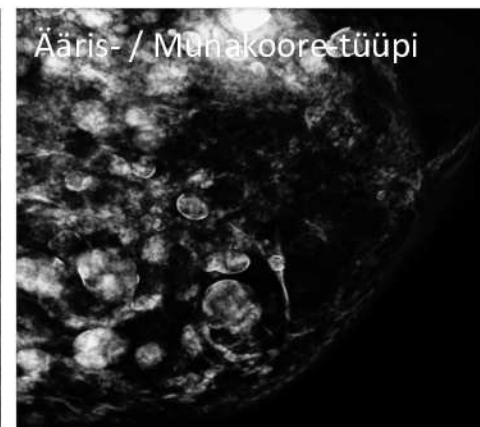
Kaltsiumpiim



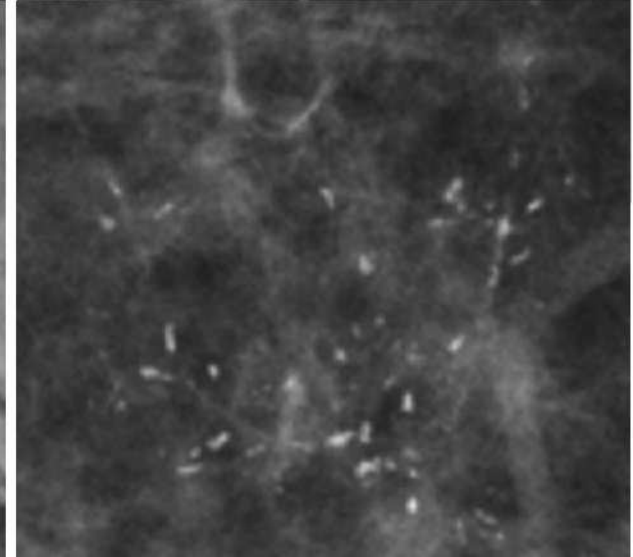
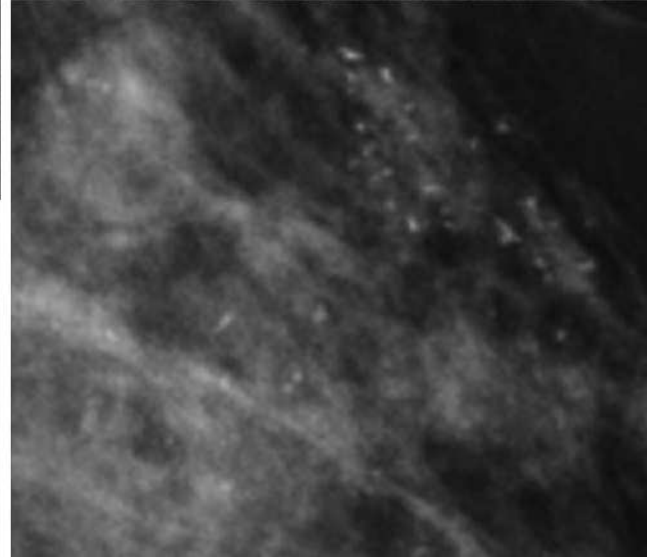
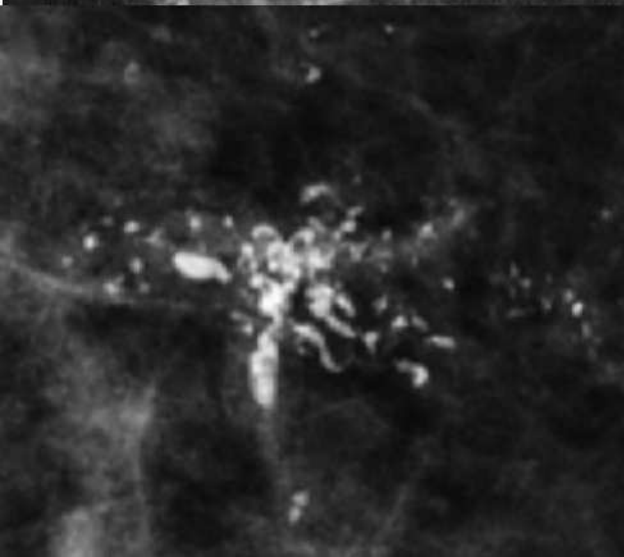
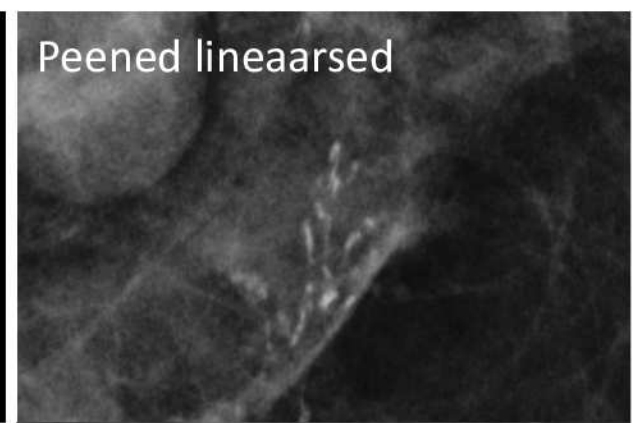
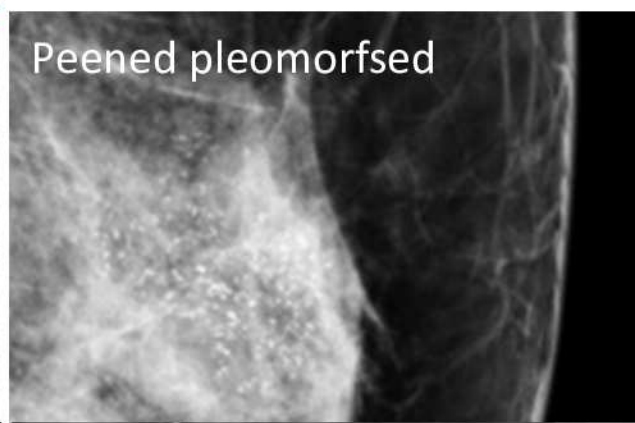
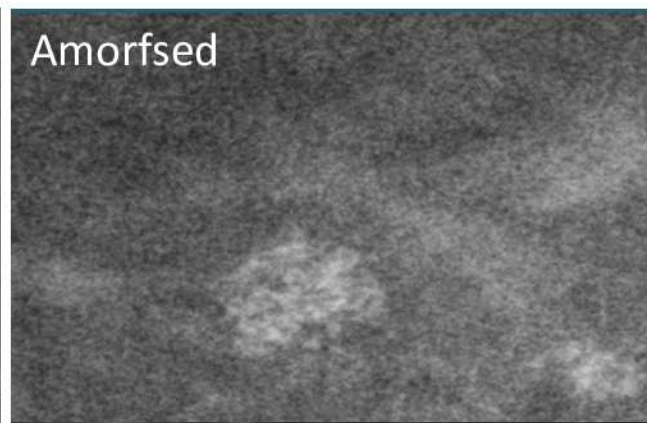
Õmblus-



Ääris- / Mühakoore-tüüpi



Kahtlased mikrolubjastused

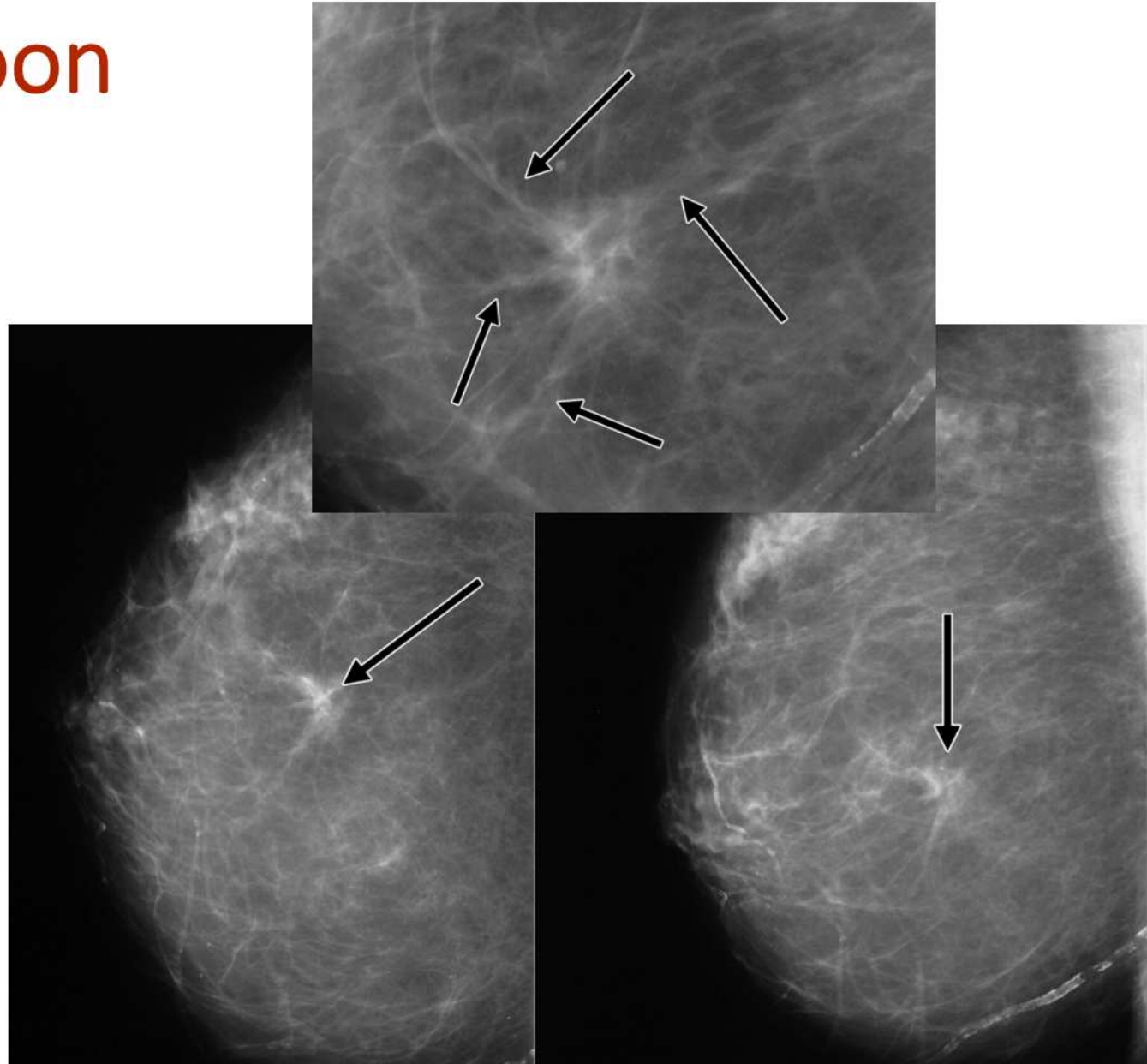


Strooma deformatsioon

Tavapärase struktuuri moonutus

- Keskpunktist lähtuvad sirged jooned, kiirjad jätked
- Parenhüümi kontuuri moonutus

Maliigsus

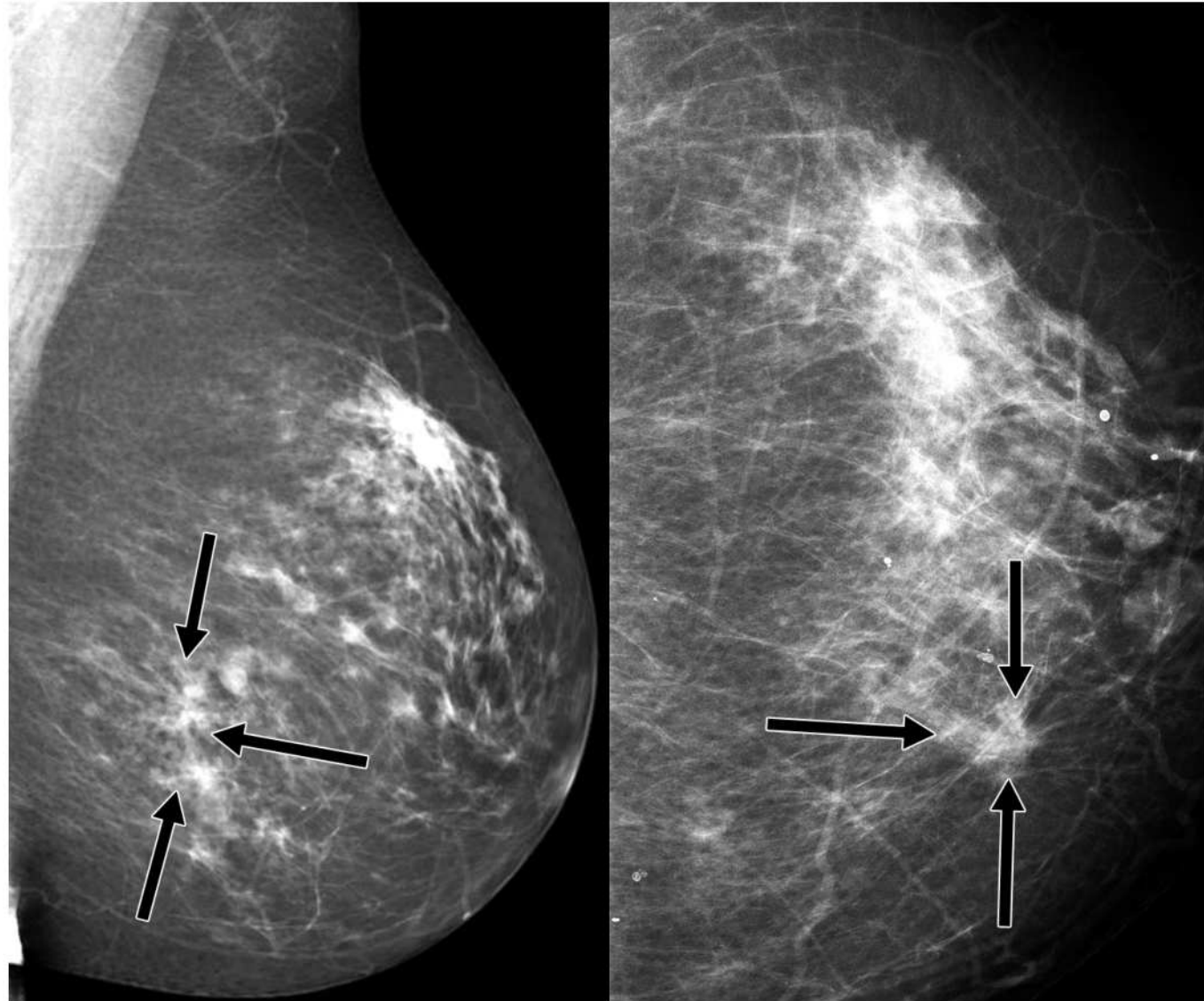


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Maliigsus
Radiaalne arm



Strooma deformatsioon

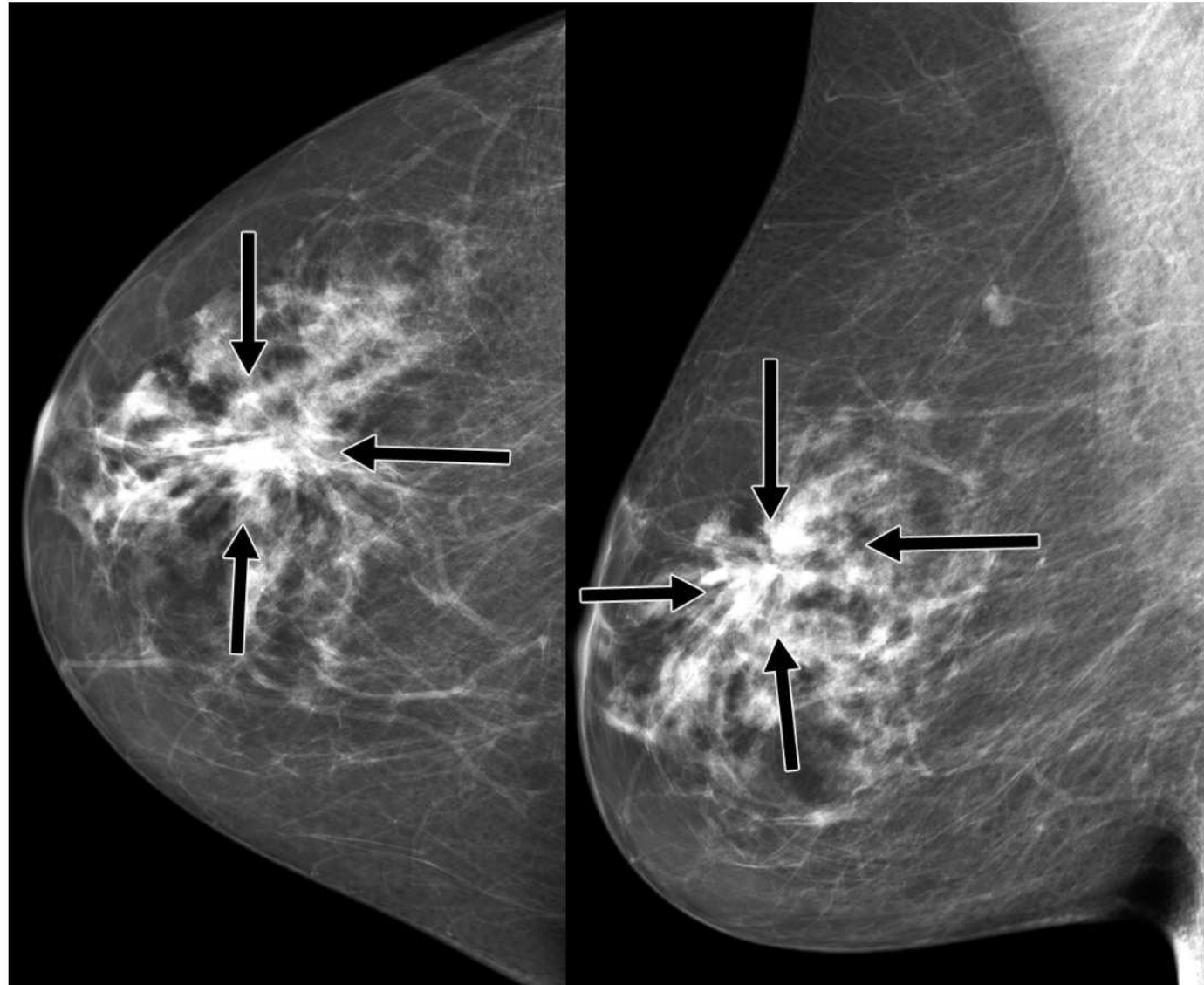
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Maliigsus

Radiaalne arm

Armkuude (trauma, post-op.)



Asümmeetriad

Unilateraalne fibroglandulaarse koe ala, mis ei ole sedastatav kui mass (nõgusad kontuurid; rasvkoega põimitud)

- **Asümmeetria**

- Jälgitav vaid ühel projektsioonil

Summatsioon

- **Fokaalne asümmeetria**

- Jälgitav vähemalt kahel projektsioonil
- Väiksem kui üks kvadrant

- **Globaalne asümmeetria**

- Jälgitav vähemalt kahel projektsioonil
- Vähemalt üks kvadrant
- Puudub mass, strooma deformatsioon, kahtlased lubikolded

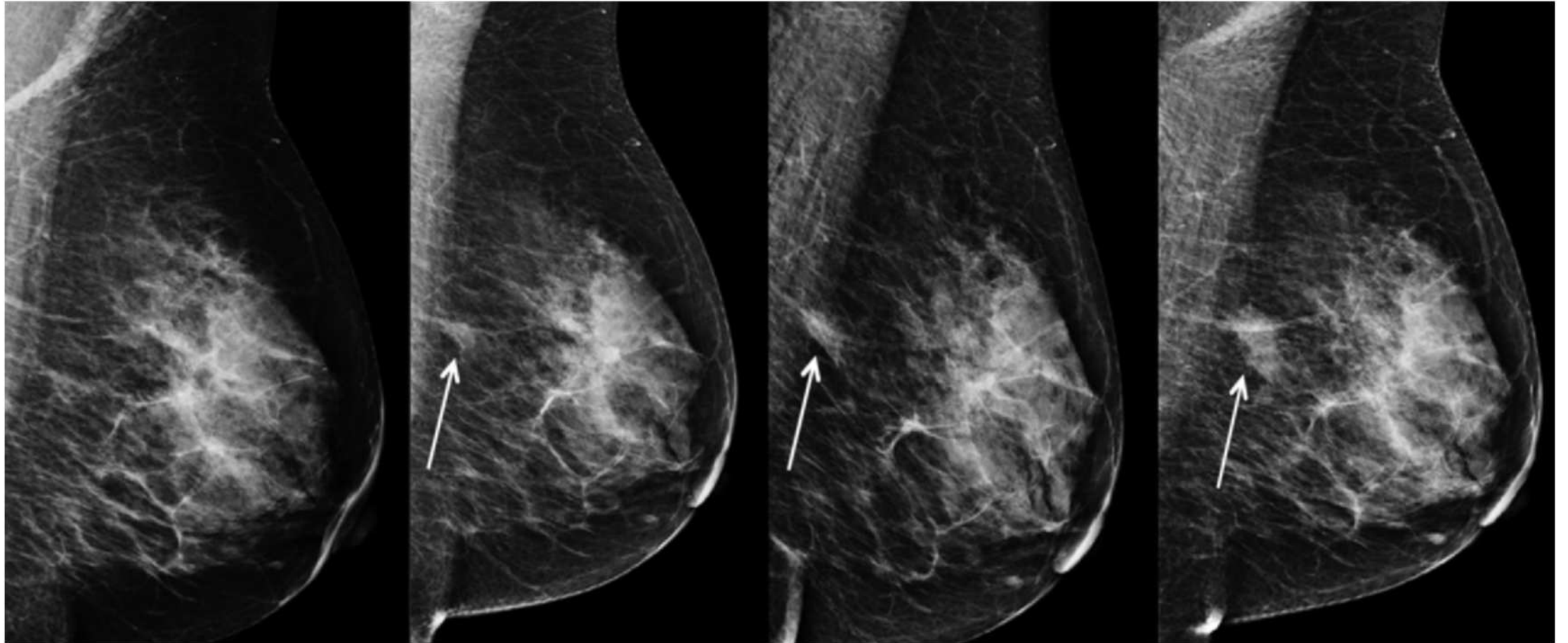
Normi variant

- **Arenev asümmeetria**

- Fokaalne asümmeetria, mis on uus, suurem või silmatorkavam võrreldes varasemate uuringutega

Ligikaudu 15% maliigsus

Asümmeetriad



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BI-RADS 1

Negatiivne

- Oluline leid puudub
 - Sh ka palpatoorse leiu olemasolul – soovita täiendavaid uuringuid/konsultatsioone

Rutiinne sõeluuring

BI-RADS 2

Beniigne

- Sisuliselt 0% tõenäosus maliigsusele
- Beniigne leid, mida on kirjeldatud
 - Tüüpilised involutiivsed kaltsifitseerunud fibroadenoomid, rasvkoelised muutused (lipoomid, õlitsüstid, ...), beniigsed lubjastused, intramammaarsed lümfisõlmed, implantaadid, post-op. muutused, vöördkehad, ...
 - Reaktiivse/infektsioosse olemusega bilateraalne lümfadenopaatia
 - Abstsess/hematoom, implantaadi kahjustus – soovita vajadusel edasist käsitlust

Ära kasuta, kui ...

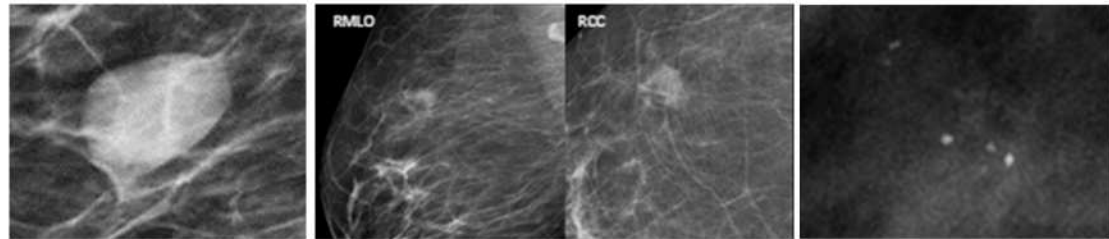
- beniigset leidu ei ole kirjeldatud (vastasel juhul BI-RADS 1)

Rutiinne sõeluuring

BI-RADS 3

Tõenäoliselt beniigne

- Tõenäosus maliigsusele $> 0\%$, kuid $\leq 2\%$
- Tõenäoliselt beniigne leid, mis eeldatavasti ajas ei muutu, kuid radioloog soovib kinnitada leiu stabiilsust
- Kolm spetsiifilist leidu
 - Mittekaltsifitseerunud piiritletud ümar mass
 - Fokaalne asümmeetria
 - Üksik punktjate lubjastuste rühm
- Radioloogi varasem kogemus
- Palpeeritav muutus?



Ära kasuta, kui ...

- tegemist on sõeluuringuga – eelnevalt vajalik diagnostiline läbivaatus!
- kahtled, kas leid on beniigne või kahtlane
- leiu täpsustamiseks on vajalik MR-uuring

Jälgimine – 6, 12 ja 24 kuud

BI-RADS 4

Kahtlane

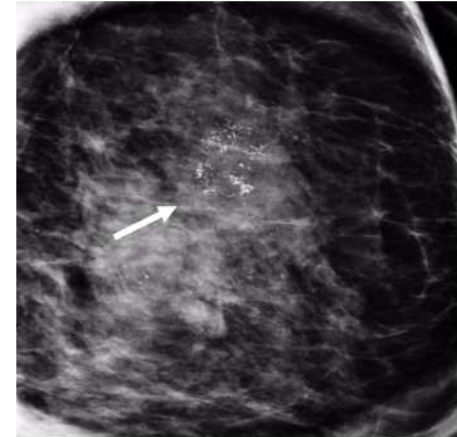
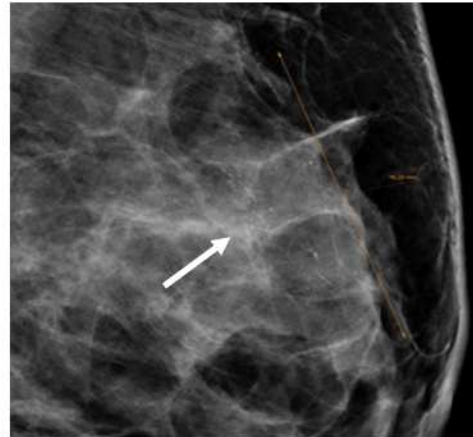
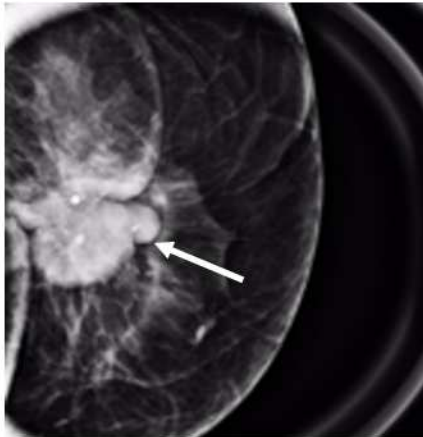
- Tõenäosus maliigsusele 2-95%
 - A. $> 2\% - \leq 10\%$
 - B. $> 10\% - \leq 50\%$
 - C. $> 50\% - \leq 95\%$
- Leid, millel puuduvad klassikalised maliigsuse tunnused, kuid on piisavalt kahtlane õigustamaks biopsiat
 - Sh kahtlane unilateraalne lümfadenopaatia ilma muu koldeleiuta

Biopsia

BI-RADS 5

Oluline maliigsusele viitav leid

- Tõenäosus maliigsusele >95%
- Klassikaline maliigsusele viitav leid
 - Ebakorrapärane kiirjate jätketega tihe mass
 - Segmentaalse või lineaarse paiknemisega peened lineaarsed mikrolubjastused
 - Ebakorrapärane kiirjate jätketega mass pleomorfsete lubjastustega



Biopsia

BI-RADS 0

Vajalik täiendav piltdiagnostika

(*spot compression*; eriprojektsioonid; UH; tomosüntees)

- Üldjuhul kasutatakse üksnes sõeluuringu puhul

Ära kasuta, kui ...

- leid on juba ilmselgelt kahtlane
- leid vajab edasist täpsustamist MR-uuringul

BI-RADS 6

Teadaolev biopsial tõestatud maliigsus

- Neoadjuvantse kemoteraapia vastuse hindamine
- Preoperatiivne MR-uuring

Ära kasuta, kui ...

- lisaks biopsial tõestatud maliigsusele tuleb esile mõni muu oluline leid

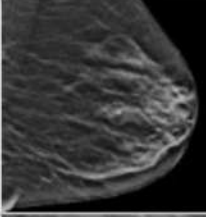
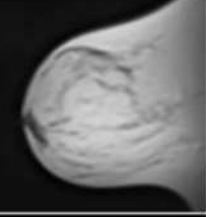
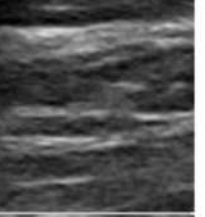
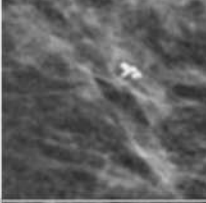
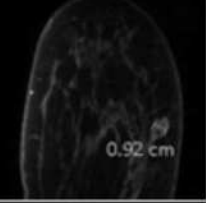
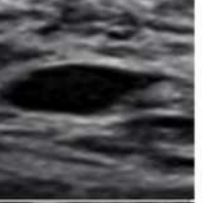
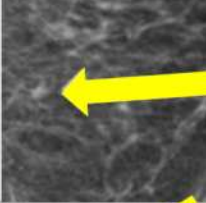
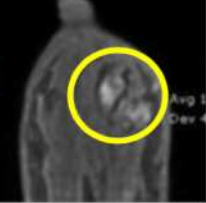
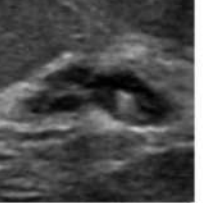
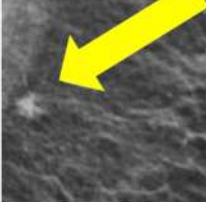
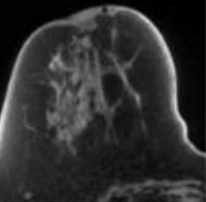
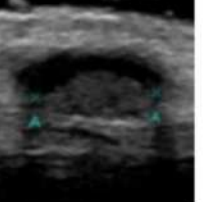
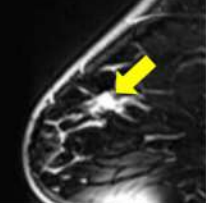
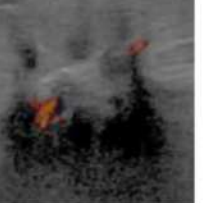
BI-RADS

Pathologic Condition
Breast cancer

Score or Category
0–6 (4AC)

Assignment
Patient-based

Modalities or Technique
Mammography, MRI, US

Category	Features and Imaging Findings	Management	Mammo	MRI	US
BI-RADS 1	Negative: no visible abnormalities, no well-formed mass, asymmetric glandular structure, no change from prior examination	No additional actions			
BI-RADS 2	Benign: calcified fibroadenomas, cysts, and fatty densities such as lipomas, galactoceles, oil cysts, hamartomas, surgical scars, secretory ductal ectasia, vascular calcifications, breast implants, silicone granulomas, etc	No additional actions			
BI-RADS 3	Probably benign: risk of malignancy is lower than 2%; includes noncalcified solid nodules (arrow), clusters of round or oval calcifications (circle), fibroglandular densities, dilated duct or postbiopsy architectural distortion without central density, etc	Initial short-interval (6 months) follow-up			
BI-RADS 4	Suspicious: risk of malignancy is 2%–94%; 4A = low suspicion, 4B = moderate suspicion, 4C = high suspicion; includes asymmetric, localized, and evolving areas of high density with convex contours, noncystic opacities with obscure contours, etc	Biopsy should be considered			
BI-RADS 5	Highly suspicious: risk of malignancy is >94%; includes microcalcifications with linear branching, clusters with segmental galactophorous distribution, evolving lesions with architectural distortion, poorly circumscribed opacities with irregular contours, speculation, etc	Appropriate action should be taken			

Additional Categories

BI-RADS 0: Incomplete assessment → Need to perform repeat imaging or to review prior mammograms for comparison

BI-RADS 6: Known biopsy-proven malignancy → Appropriate action should be taken



ACR BI-RADS® Atlas Fifth Edition

QUICK REFERENCE



MAMMOGRAPHY		
Breast composition	a. The breasts are almost entirely fatty b. There are scattered areas of fibroglandular density c. The breasts are heterogeneously dense, which may obscure small masses d. The breasts are extremely dense, which lowers the sensitivity of mammography	
Masses	Shape	Oval Round Irregular
	Margin	Circumscribed Obscured Microlobulated Indistinct Spiculated
	Density	High density Equal density Low density Fat-containing
Calcifications	Typically benign	Skin Vascular Coarse or "popcorn-like" Large rod-like Round Rim Dystrophic Milk of calcium Suture
	Suspicious morphology	Amorphous Coarse heterogeneous Fine pleomorphic Fine linear or fine-linear branching
	Distribution	Diffuse Regional Grouped Linear Segmental
Architectural distortion		
Asymmetries	Asymmetry	
	Global asymmetry Focal asymmetry Developing asymmetry	
Intramammary lymph node		
Skin lesion		
Solitary dilated duct		
Associated features	Skin retraction	
	Nipple retraction	
	Skin thickening	
	Trabecular thickening	
	Axillary adenopathy	
	Architectural distortion	
	Calcifications	
	Laterality	
	Quadrant and clock face	
	Depth	
	Distance from the nipple	

ULTRASOUND		
Tissue composition (screening only)	a. Homogeneous background echotexture – fat b. Homogeneous background echotexture – fibroglandular c. Heterogeneous background echotexture	
Masses	Shape	Oval Round Irregular
	Orientation	Parallel Not parallel
	Margin	Circumscribed Not circumscribed - Indistinct - Angular - Microlobulated - Spiculated
Echo pattern	Anechoic	
	Hyperechoic	
	Complex cystic and solid	
Posterior features	Hypoechoic	
	Isoechoic	
	Heterogeneous	
Calcifications	Calcifications in a mass	
	Calcifications outside of a mass	
	Intraductal calcifications	
Associated features	Architectural distortion	
	Duct changes	
	Skin changes	Skin thickening Skin retraction
	Edema	
	Vascularity	Absent Internal vascularity Vessels in rim
	Elasticity assessment	Soft Intermediate Hard
	Simple cyst	
	Clustered microcysts	
	Complicated cyst	
	Mass in or on skin	
Special cases	Foreign body including implants	
	Lymph nodes – intramammary	
	Lymph nodes – axillary	
	AVMs (arteriovenous malformations/pseudoaneurysms)	
	Mondor disease	
	Postsurgical fluid collection	
	Fat necrosis	

MAGNETIC RESONANCE IMAGING					
Amount of fibroglandular tissue (FGT)	a. Almost entirely fat b. Scattered fibroglandular tissue c. Heterogeneous fibroglandular tissue d. Extreme fibroglandular tissue		Associated features	Nipple retraction	
Background parenchymal enhancement (BPE)	Level	Minimal Mild Moderate Marked		Nipple invasion	
	Symmetric or asymmetric	Symmetric Asymmetric		Skin retraction	
Focus	Shape	Oval Round Irregular	Fat containing lesions	Skin thickening	
				Skin invasion	
	Margin	Circumscribed Not circumscribed - Irregular - Spiculated		Direct invasion Inflammatory cancer	
Masses	Internal enhancement characteristics	Homogeneous Heterogeneous Rim enhancement Dark internal septations	Location of lesion	Axillary adenopathy	
				Pectoralis muscle invasion	
	Shape	Circumscribed Not circumscribed - Irregular - Spiculated		Chest wall invasion	
Non-mass enhancement (NME)	Distribution	Focal Linear Segmental Regional Multiple regions Diffuse	Kinetic curve assessment Signal intensity (SI)/ time curve description	Architectural distortion	
				Lymph nodes	
	Internal enhancement patterns	Homogeneous Heterogeneous Clumped Clustered ring		Normal Abnormal	
Intramammary lymph node	Implant location	Retroglandular Retropectoral	Implants	Fat necrosis	
				Hamartoma	
	Abnormal implant contour			Postoperative seroma/hematoma with fat	
Skin lesion	Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	Location	
				Depth	
	Non-enhancing findings	Implant location		Retroglandular Retropectoral	Kinetic curve assessment Signal intensity (SI)/ time curve description
Slow					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Fast				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Persistent					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Washout				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Lumen type					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	- Double				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Implant location					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Retropectoral				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Intracapsular silicone findings					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Subcapsular line				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Linguine sign					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Breast				
	Non-enhancing findings	Implant location	Retroglandular Retropectoral		Kinetic curve assessment Signal intensity (SI)/ time curve description
Water droplets					
Non-enhancing findings		Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other	Location of lesion	
	Signal void from foreign bodies, clips, etc.				

BI-RADS® ASSESSMENT CATEGORIES		
Category 0: Mammography: Incomplete – Need Additional Imaging Evaluation and/or Prior Mammograms for Comparison Ultrasound & MRI: Incomplete – Need Additional Imaging Evaluation		
Category 1: Negative		
Category 2: Benign		
Category 3: Probably Benign		
Category 4: Suspicious		
Category 5: Highly Suggestive of Malignancy		
Category 6: Known Biopsy-Proven Malignancy		

Kasutatud materjalid

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