

Milano, 21 Settembre 2018

Breast MRI bases and cases



2nd look ultrasound

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Razionale

Meta-analisi **RM mammaria CMC** (44 studi)

Elevata SENSIBILITA' 90%

Moderata SPECIFICITA' 72%



Reperti aggiuntivi RM 16-48%

Rischio di FALSI POSITIVI

Falsi Positivi RM

Linfonodi

Malattia cistica

Radial scar

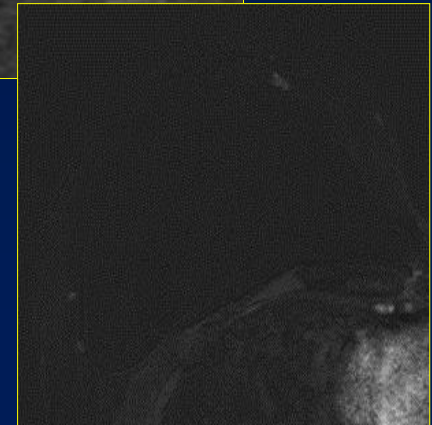
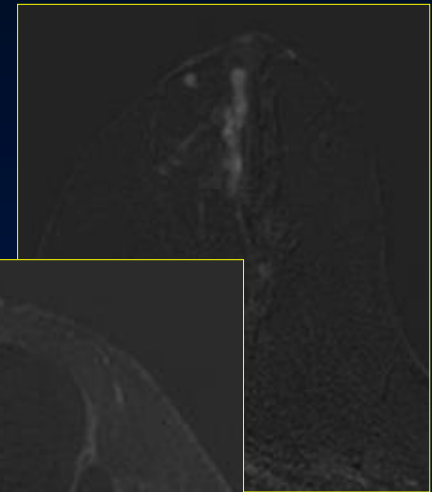
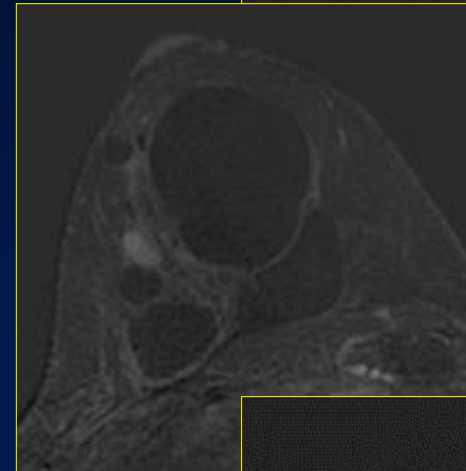
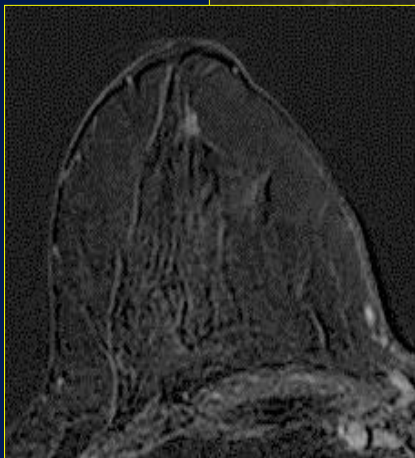
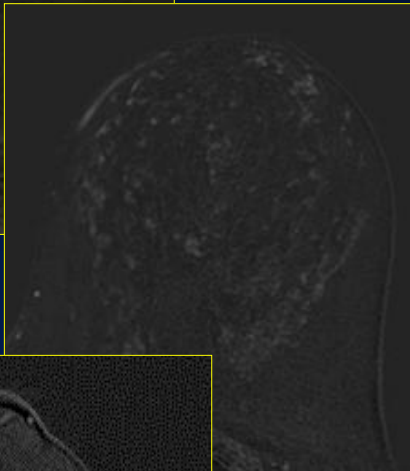
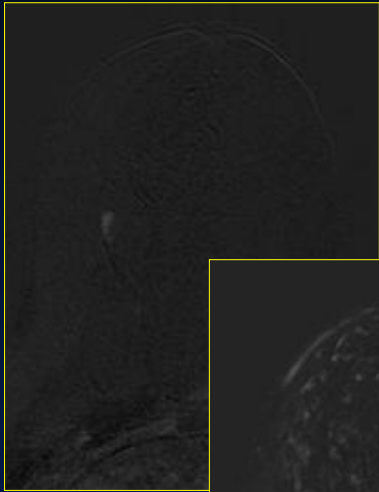
Adenosi

Fibroadenoma

Papilloma

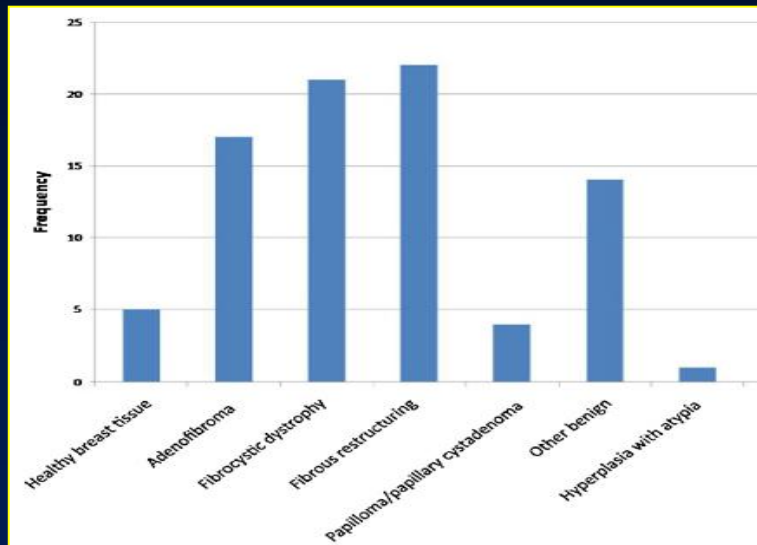
Liponecrosi

...FP da artefatti!



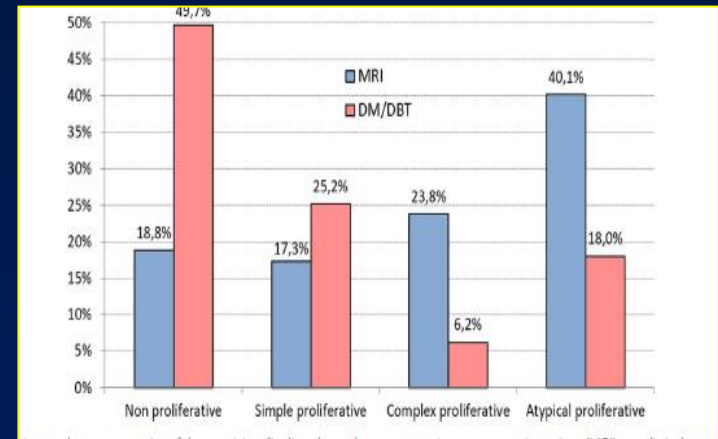
2nd look ultrasound

Falsi Positivi RM



76% (82/108) reperti RM aggiuntivi visibili 2nd look US non maligni

45% (202/366) reperti RM aggiuntivi non visibili 2nd look US non maligni



Nouri-Neuville M et al. Diagn Interv Imaging 2014;95:197-211.

Kuhl C et al. Not all false positive diagnosis are equal. Breast Cancer Research 2018;28:13.

RM stadiazione locale

MULTIFOCALITA'
MULTICENTRICITA'
BILATERALITA'

FALSI POSITIVI

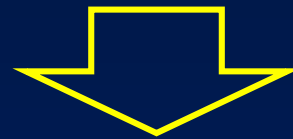


¿ RISCHIO OVER-TREATMENT ?

RM stadiazione locale

MULTIFOCALITA'
MULTICENTRICITA'
BILATERALITA'

FALSI POSITIVI



*Non convertire intervento **CONSERVATIVO** in **MASTECTOMIA**
per reperti RM aggiuntivi **SENZA** conferma istologica*

Possibili soluzioni

- ✓ Rispetto indicazioni
- ✓ Rispetto timing
- ✓ Esami buona qualità

- ✓ 2nd look US / DBT
- ✓ Biopsia RM guidata
- ✓ Follow up RM (NO PRE-CHIRURGIA)

Possibili soluzioni

✓ Rispetto indicazioni

Table 1 Indications for breast MRI

Screening of women at high risk of breast cancer
Preoperative staging of newly diagnosed breast cancer (ipsilateral and contralateral)
Evaluation of the effect of neoadjuvant chemotherapy
Evaluation of women with breast implants
Occult primary breast carcinoma (search for breast cancer in patients with metastases and negative mammography and ultrasound)
Suspected local recurrence*
Problem solving (equivocal findings at mammography/ultrasound)*

*When needle biopsy cannot be performed

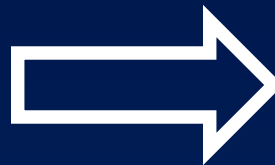
Other new indications were recently proposed, such as nipple discharge [8] and evaluation of lesions with uncertain malignant potential (so-called high-risk or B3 lesions) detected at mammography or ultrasound, and needle-biopsied under their guidance [9]

Possibili soluzioni

- ✓ Rispetto timing

NO 1^a e 4^a settimana di ciclo mestruale

Stimolazione
ormonale

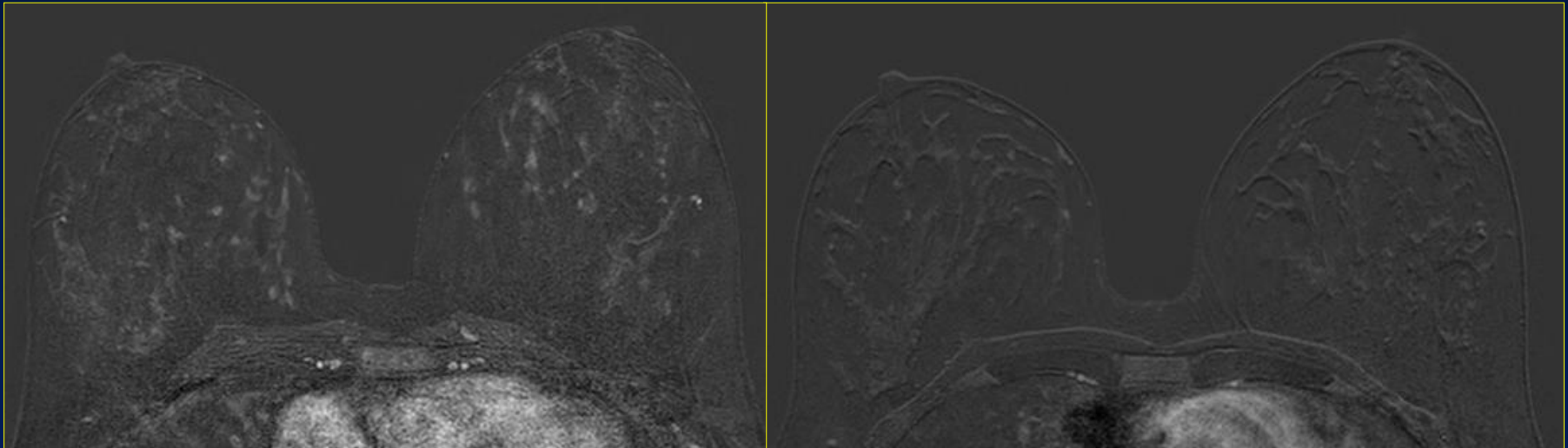


vascolarizzazione

Rischio di UBOs (Unidentified Breast Objects)

Possibili soluzioni

- ✓ Rispetto timing



OK 2^a settimana di ciclo mestruale

Possibili soluzioni

- ✓ Esami buona qualità
- Bobina dedicata multicanale
- Risoluzione temporale e spaziale
- Studio dinamico - Sottrazione
- Lessico BI-RADS

Eur Radiol (2008) 18: 1307–1318
DOI 10.1007/s00330-008-0863-7

NEWS FROM EUSOBI

R. M. Mann
C. K. Kuhl
K. Kinkel
C. Boetes

Breast MRI: guidelines from the European Society of Breast Imaging

EUROPEAN JOURNAL OF CANCER 46 (2010) 1296–1316

Magnetic resonance imaging of the breast: Recommendations from the EUSOMA working group

Francesco Sardanelli ^{a,*}, Carla Boetes ^b, Bettina Borisch ^c, Thomas Decker ^d, Massimo Federico ^e, Fiona J. Gilbert ^f, Thomas Helbich ^g, Sylvia H. Heywang-Köbrunner ^h, Werner A. Kaiser ⁱ, Michael J. Kerin ^j, Robert E. Mansel ^k, Lorenza Marotti ^l, Laura Martincich ^m, Louis Mauriac ⁿ, Hanne Meijers-Heijboer ^o, Roberto Orecchia ^p, Pietro Panizza ^q, Antonio Ponti ^r, Arnie D. Purushotham ^s, Peter Regitnig ^t,

2nd look ultrasound



RM



COMPLETAMENTO/DUBBIO

IMAGING TRADIZIONALE

! SOLUZIONE !

2nd look ultrasound

RM



COMPLETAMENTO/DUBBIO

IMAGING TRADIZIONALE

! SOLUZIONE !



RM

¿ NUOVI DUBBI ?



2nd look ultrasound

RM



COMPLETAMENTO/DUBBIO

IMAGING TRADIZIONALE

! SOLUZIONE !



RM

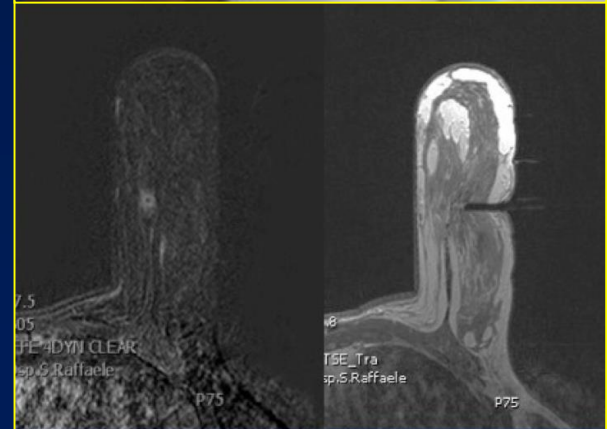
¿ NUOVI DUBBI ?



2nd LOOK ECOGRAFICO/BIOPSIA RM/RM 6 MESI

Biopsia mammaria RM guidata

- ✓ Centri dedicati
- ✓ Elevati costi
- ✓ Gadolinio
- ✓ Decubito prono obbligato



2nd look ultrasound

- ✓ Localizzare il reperto RM aggiuntivo
- ✓ Guidare il prelievo microistologico

2nd look ultrasound

	N° lesioni	% 2 nd US+	Associazioni 2 nd US+		Popolazione
Panizza 1997	14	79%			
La Trenta 2003	93	23%	npl		
Sim 2005	48	67%	npl		R FAM
Beran 2005	73	89%	npl		
Shin 2007	38	71%	mass		BC pz
Wiratkapun 2008	97	47%	mass	cm	
Linda 2008	173	83%			
Meissnitzer 2009	519	56%	mass	cm	
Demartini 2009	167	46%	mass		
Destounis 2009	196	70%			BC pz
Abe 2010	202	57%	npl	mass	
Carbognin 2011	62	71%	mass	cm	

2nd look ultrasound



	N° lesioni	% 2 nd US+	Associazioni 2 nd US+	Popolazione
Candelaria 2011	131	87%	mass	
Luciani 2011	55	76%	mass	BC pz
Ha 2011	34	35%		BC pz
Laguna 2011	123	62%		BC pz
Fiaschetti 2012	84	51%		BI-RADS 3
Lourenco 2012	118	46%		BI-RADS 3
Kim 2012	75	40%	mass	BC pz
Aracava 2014	68	67%		
Hong 2014	121	87%		
Hsu 2015	102	43%	npl	
Peter 2016	45	34%		
Park 2018	94	90%		BC pz

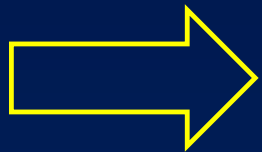
Detection rate
2nd US
23 – 90%

Meta-analisi 2nd look ultrasound

- ✓ Metanalisi 17 studi
- ✓ Detection rate 22.6% - 82.1%
Pooled detection rate 57.5%
- ✓ Prevalenza di malignità reperti RM aggiuntivi 2 – 51%

Meta-analisi 2nd look ultrasound

- ✓ Detection rate 2nd look
 - ✓ Lesioni **maligne** ($p = 0,0001$)



Probabilità di malignità > se **VISIBILE** 2nd look US

Meta-analisi 2nd look ultrasound

- ✓ Detection rate 2nd look
 - ✓ Lesioni **mass-like** ($p = 0,0001$)
 - ✓ Lesioni di grandi dimensioni

Meta-analisi 2nd look ultrasound

Se reperto RM
aggiuntivo è **visibile**
a 2nd US, qual è la
probabilità che sia
maligno?

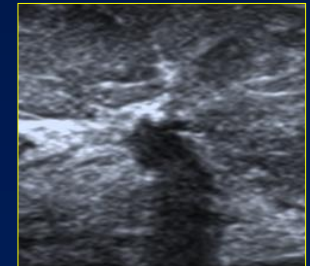
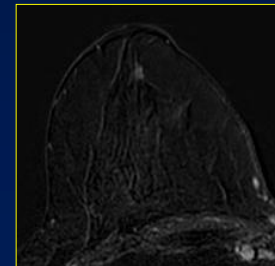
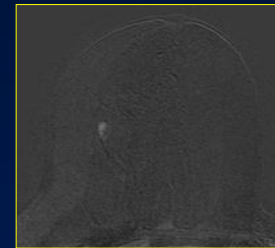
Meta-analisi 2nd look ultrasound

- ✓ VPP 2nd US **30.7%**
(4% – 56%)

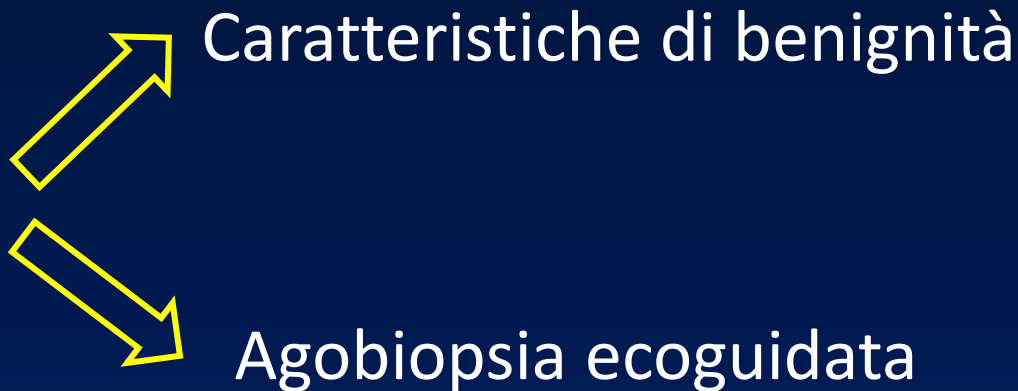
Se reperto RM
aggiuntivo è **visibile**
a 2nd US, qual è la
probabilità che sia
maligno?

Probabilità di malignità > se **VISIBILE** 2nd look US

↗ Caratteristiche di benignità
↘ Agobiopsia ecoguidata



Probabilità di malignità > se **VISIBILE** 2nd look US



Reperti US
"subdoli"

Meta-analisi 2nd look ultrasound

Se reperto RM
aggiuntivo **NON** è
visibile a 2nd US, qual
è la probabilità che
NON sia **maligno**?

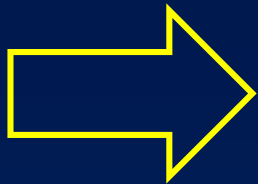
Meta-analisi 2nd look ultrasound

- ✓ VPN 2nd US **87.8%**
(46.2% - 100%)

Se reperto RM
aggiuntivo **NON** è
visibile a 2nd US, qual
è la probabilità che
NON sia **maligno**?

2nd look ultrasound

Se reperto RM **NON VISIBILE** a 2nd look ecografico
probabilità di malignità del **12.2%**



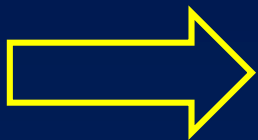
2nd look ecografico negativo non esclude
possibilità di malignità

2nd look DBT

- 520 RM preoperatorie
- 164 reperti RM aggiuntivi
- 2nd US 114/169 (69.5%)
- 2nd DBT 32/50 (19.5% sul totale)

Non mass
Focus
BIRADS 4 RM

14/32 npl o high risk



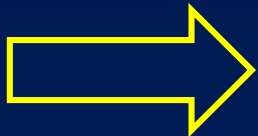
Detection rate complessiva 146/164 (89%)

2nd look DBT

- 135 RM preoperatorie
- 84 reperti RM aggiuntivi
- 2nd US 44/84 (52%)
- 2nd DBT 42/84 (50%)
- 2nd US + DBT 23/84 (27%)

Non mass e DCIS
30/42 npl o high risk

COMPLEMENTARE
A 2nd look US



Detection rate complessiva 63/84 (75%)

Tips and Tricks

1. Valutazione attenta dello studio **RM** (T1, T2, DWI, 3D)
2. Sede della lesione nei **3 piani** dello spazio
3. Distanza e rapporti con il **capezzolo**
4. Distanza e rapporti con altri punti di **reperere**
5. Dimensioni e **morfologia**

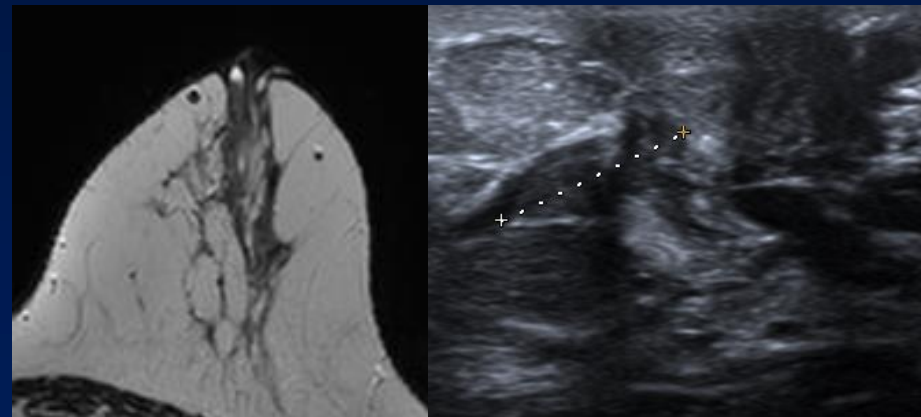
Tips and Tricks

1. Valutazione attenta dello studio **RM** (T1, T2, DWI, 3D)

Corrispettivo T2 reperto RM

Valutazione dell'area
retroareolare in T2:

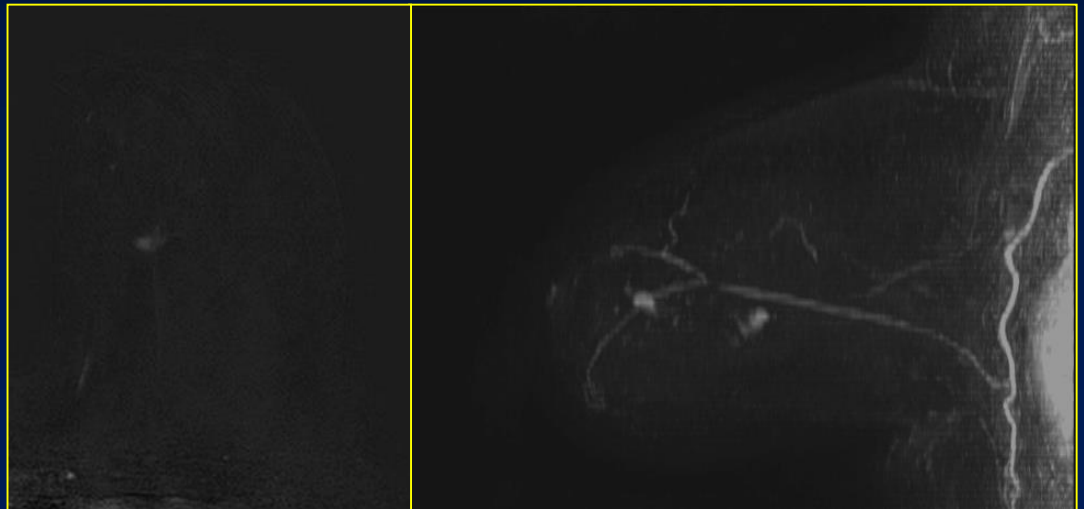
- ✓ Ectasia duttale RM
- ✓ Lesioni intraduttali 2nd US



Tips and Tricks

2. Sede della lesione nei **3 piani** dello spazio

Ricostruzioni **3D**



Tips and Tricks

Posizione della mammella dipende dal decubito: **RM**

Prono

Mammelle per gravità dentro
bobina

No compressione



Tips and Tricks

Posizione della mammella dipende dal decubito: **ECOGRAFIA**



Supino – supino / obliquo

Braccio sollevato

Tessuti compressi (specie
tessuto adiposo)

Tips and Tricks

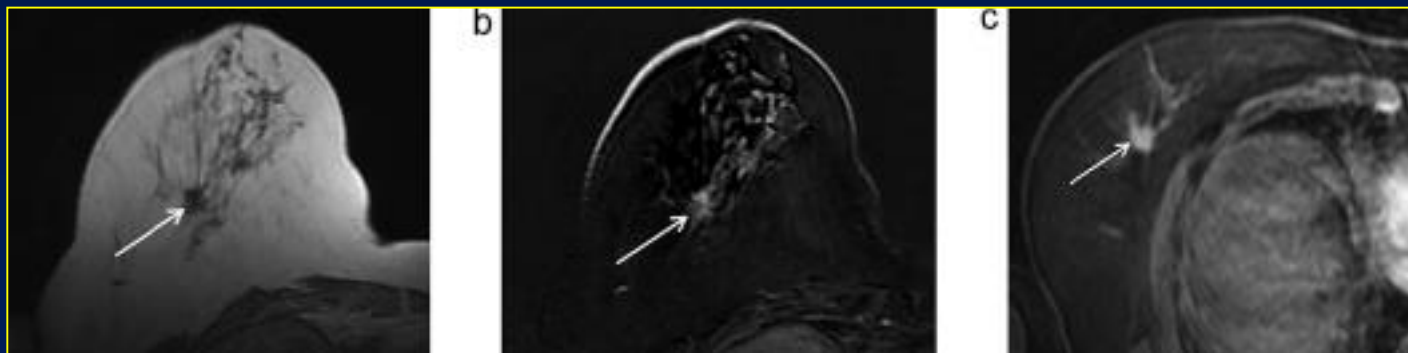
Dislocazione maggiore nei seni adiposi ($p < 0.0001$)



Tips and Tricks

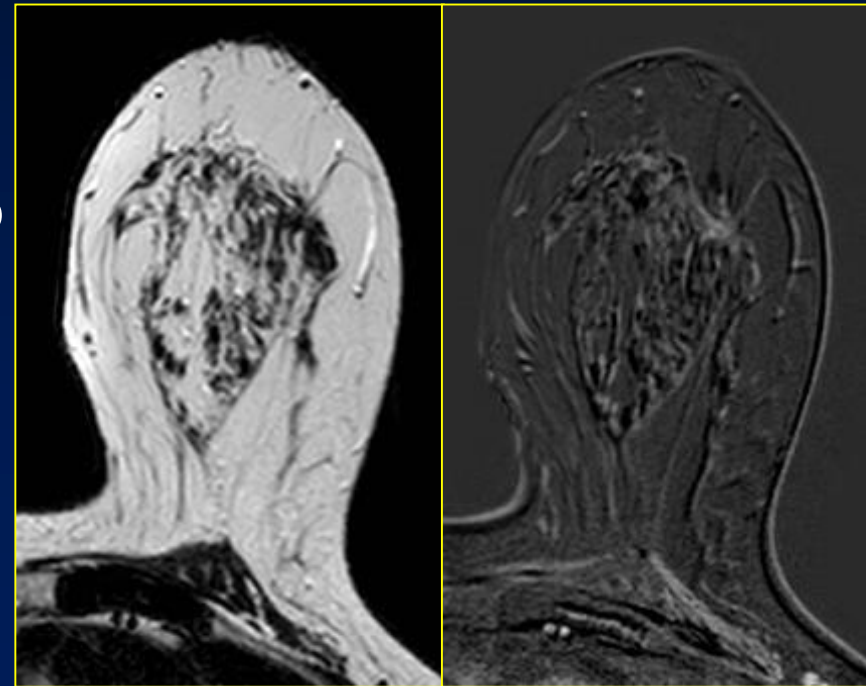
3. Distanza e rapporti con il capezzolo

- ✓ Dislocazione da decubito PRONO a SUPINO 3-6 cm (**massima AP**)
- ✓ **Distanza lesione-capezzolo** parametro più riproducibile



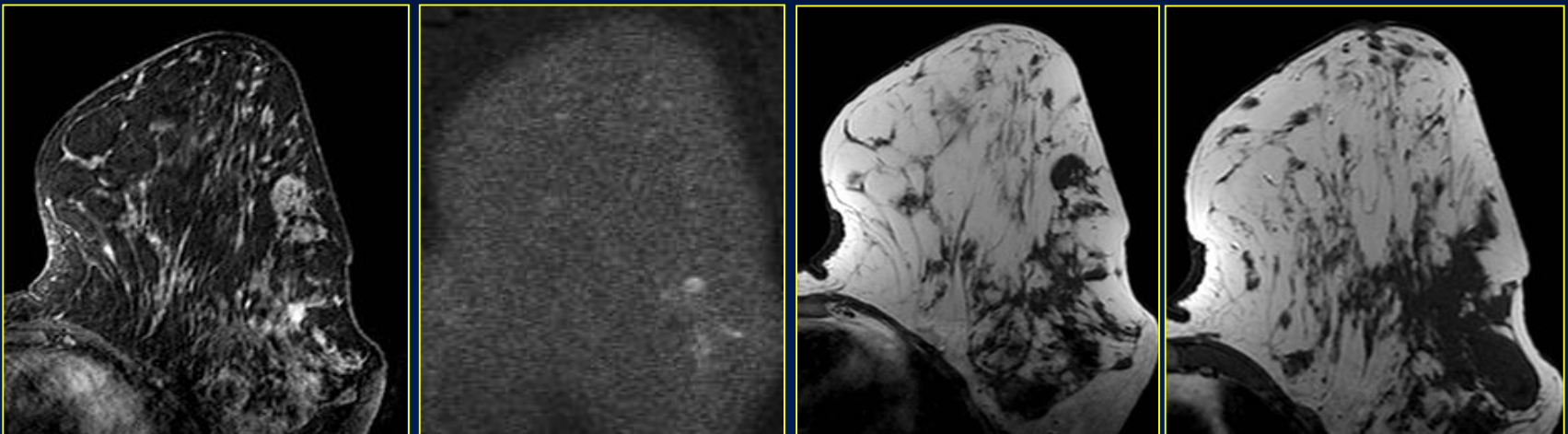
Tips and Tricks

3. Se lesione lontana dal capezzolo
- ✓ Tessuto adiposo sottocutaneo se superficiale
 - ✓ Fascia retromammaria se profonda



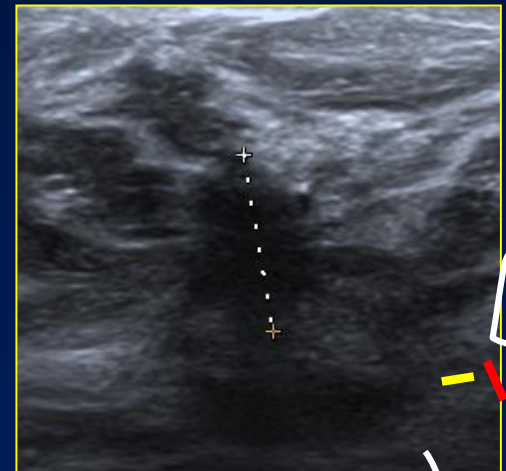
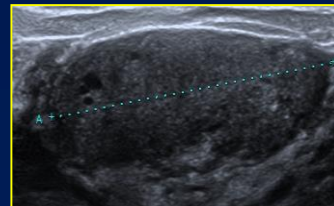
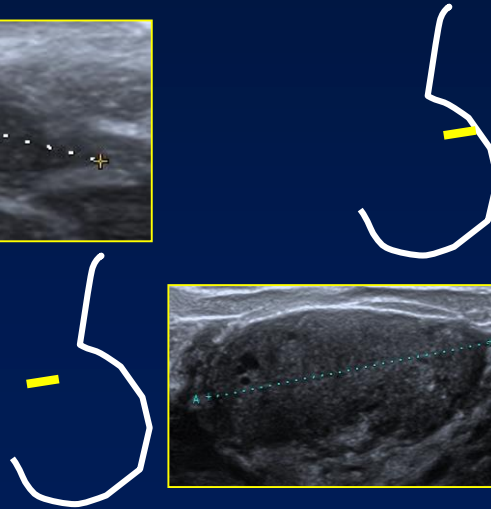
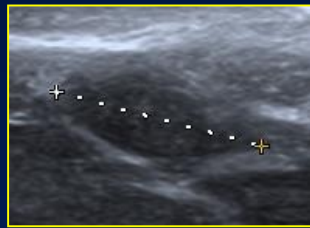
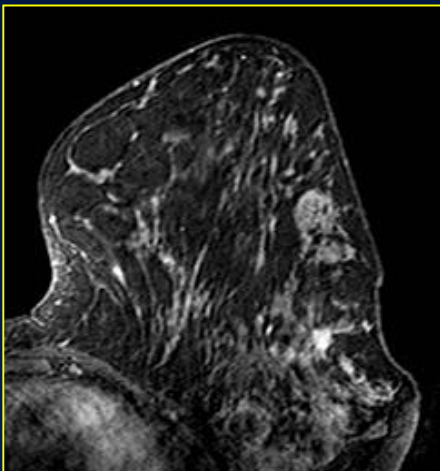
Tips and Tricks

4. Distanza e rapporti con altri punti di **reperire**



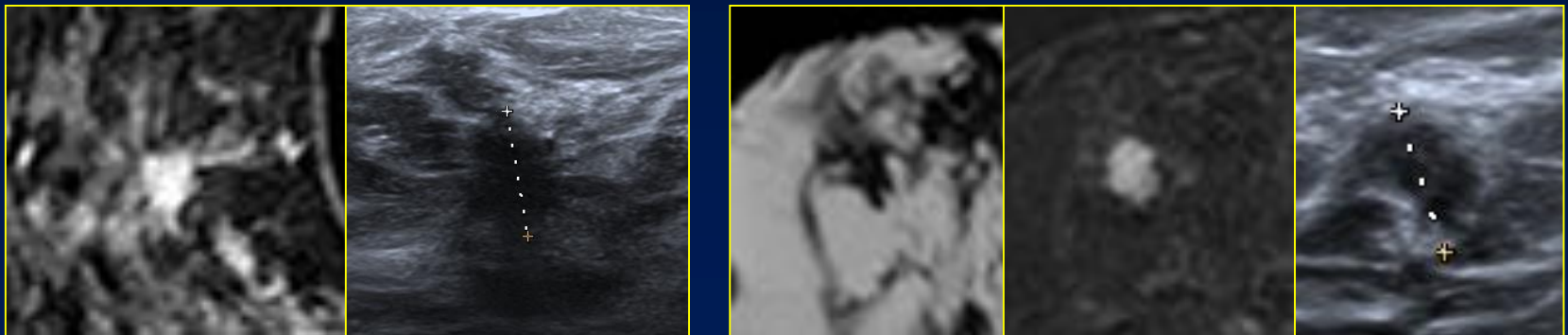
Tips and Tricks

4. Distanza e rapporti con altri punti di **repere**



Tips and Tricks

5. Dimensioni e morfologia



Tips and Tricks

Non mass-like enhancement non visibile a 2nd look US



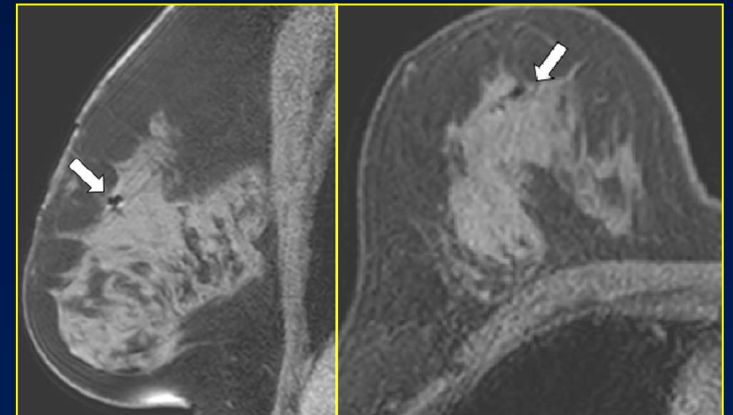
2nd look o revisione **DBT**
microcalcificazioni o distorsioni architettureali ?

Tips and Tricks

Posizionamento **clip** per verifica RM sede prelievo (**T1w GRE**)



Se clip non è posizionata correttamente

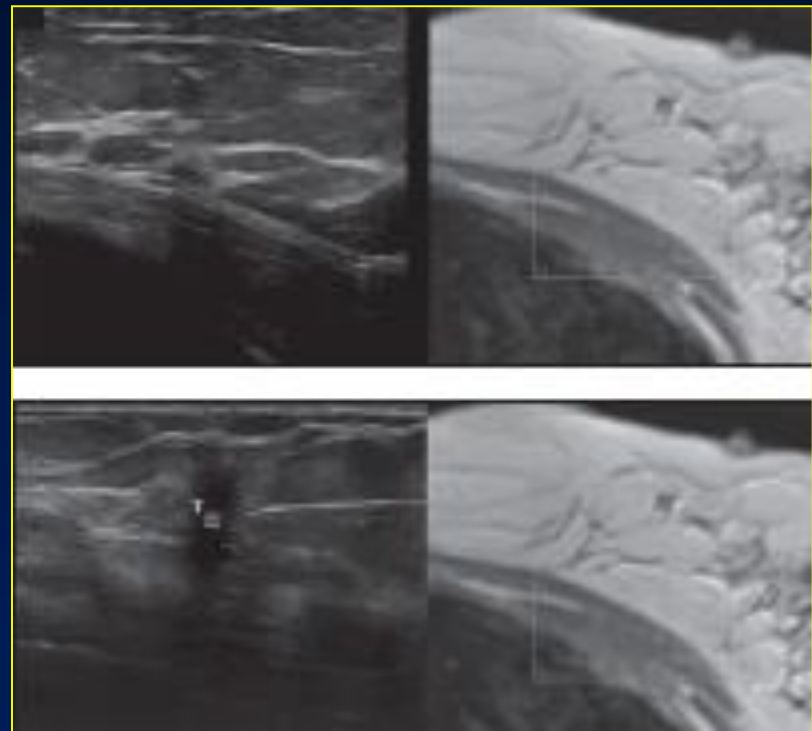
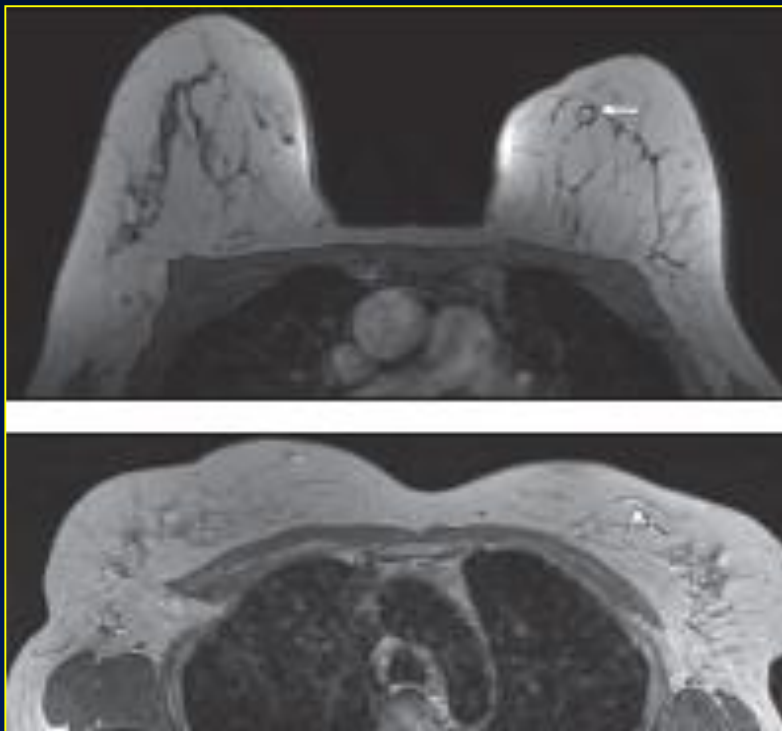


Biopsia RM-guidata BIRADS 4 e 5

Cosa ci riserva il futuro?



Volume navigation technique



Aribal E, Tureli D, Kucukkaya F, Kaya H. Volume navigation technique for ultrasound-guided biopsy of breast lesions detected only at MRI. *AJR* 2017;208:1400-1409.

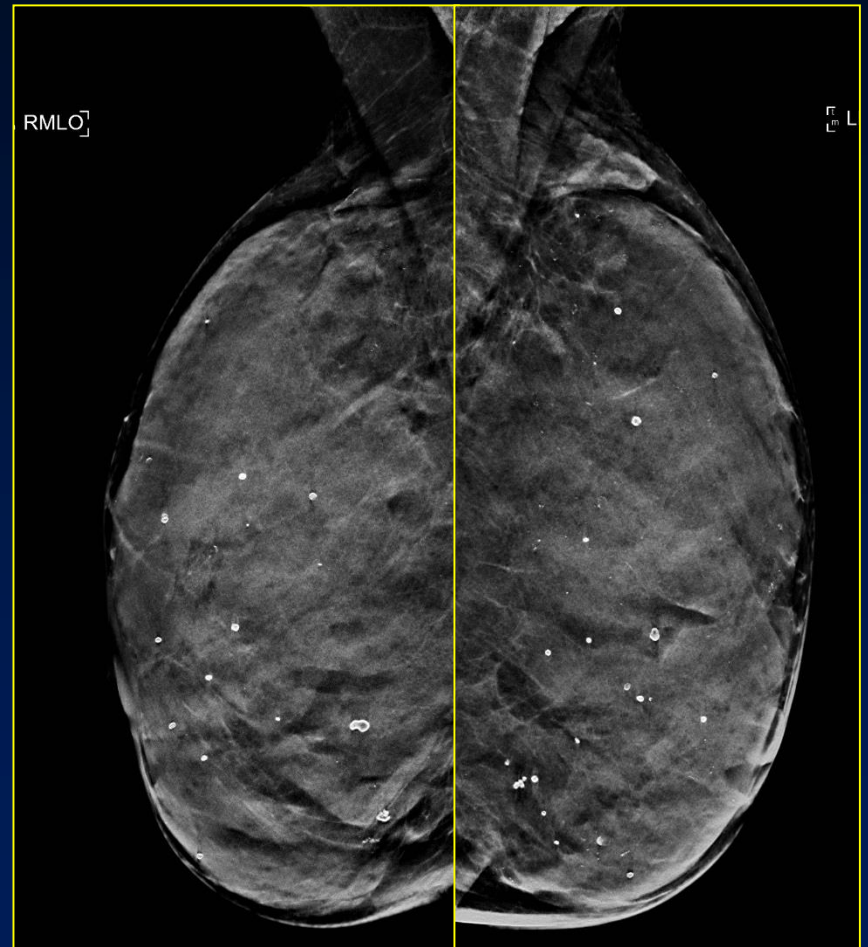
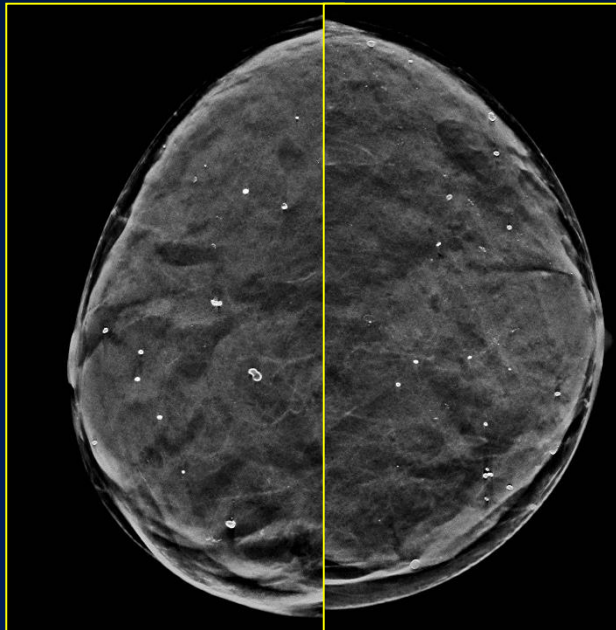
2nd look ultrasound – Caso 1

61 anni

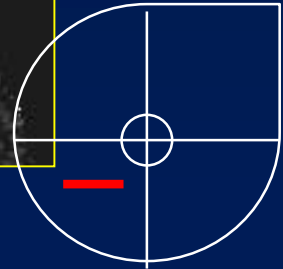
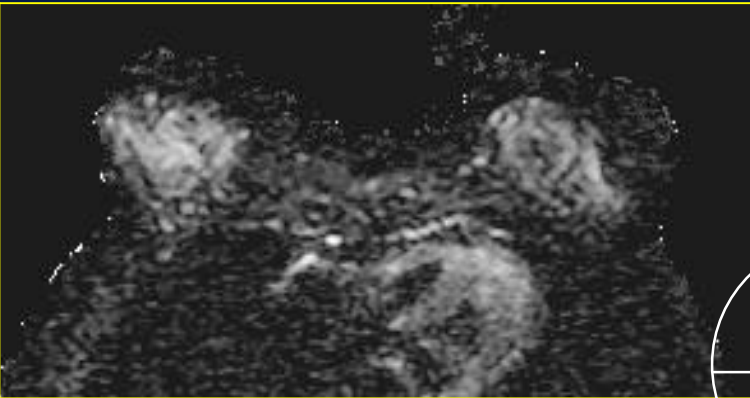
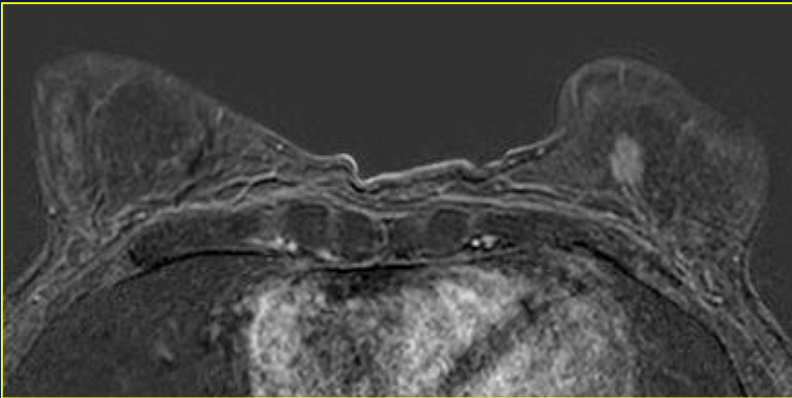
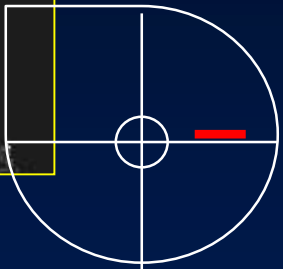
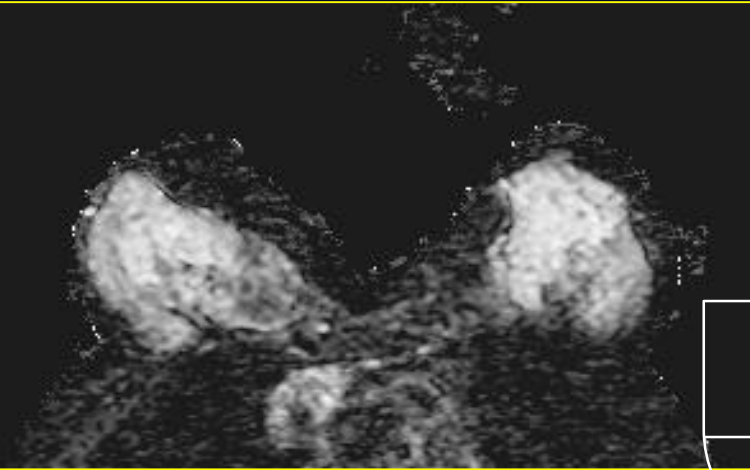
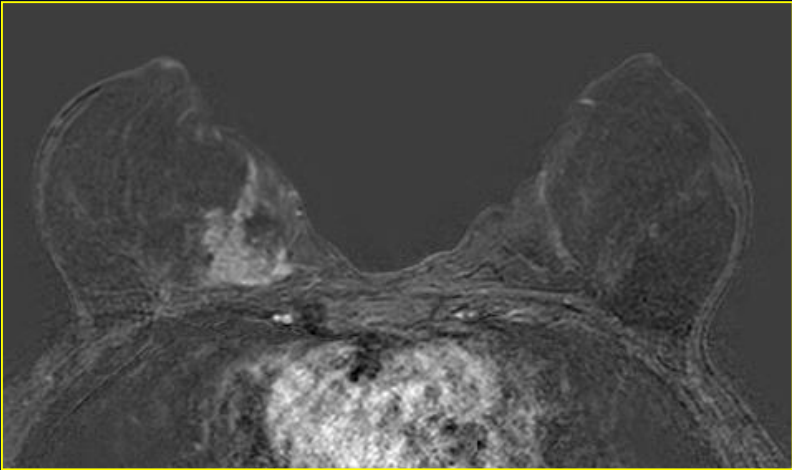
Familiarità per neoplasia
mammaria

Nodulo palpabile QQMM destra

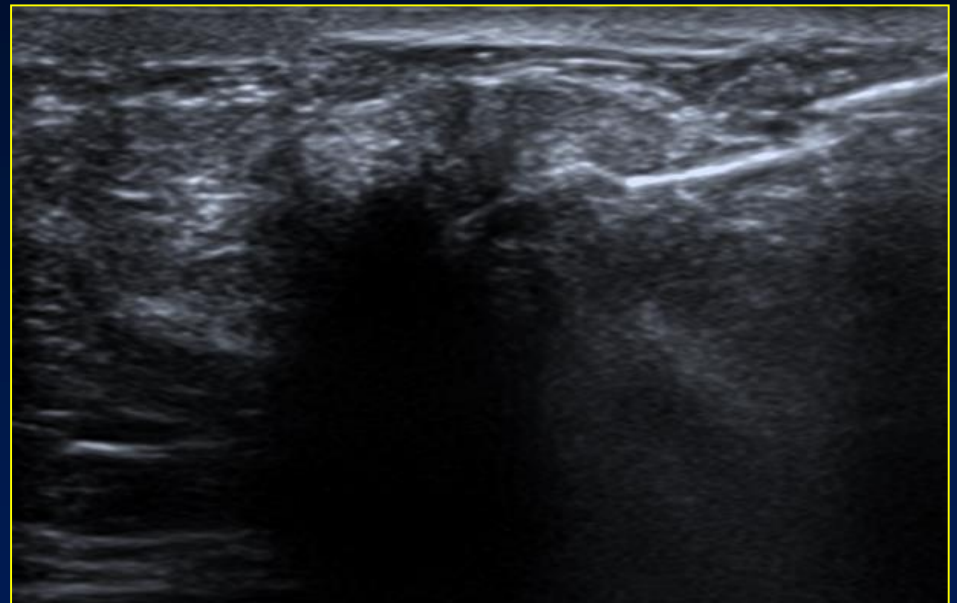
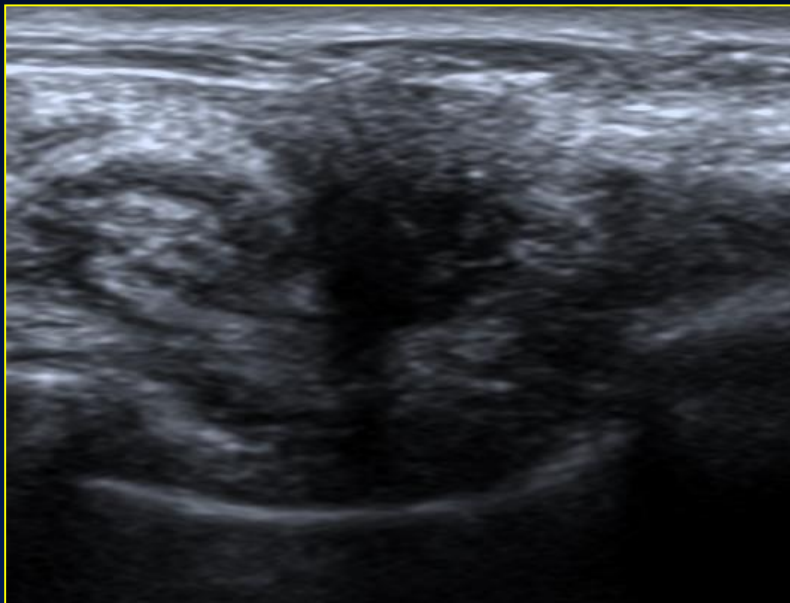
E.I. Carcinoma lobulare infiltrante



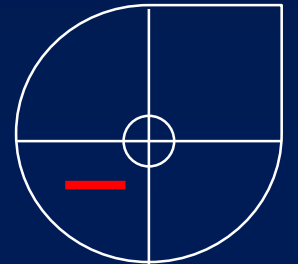
2nd look ultrasound – Caso 1



2nd look ultrasound – Caso 1



E.I. QIM sinistro: Carcinoma lobulare infiltrante



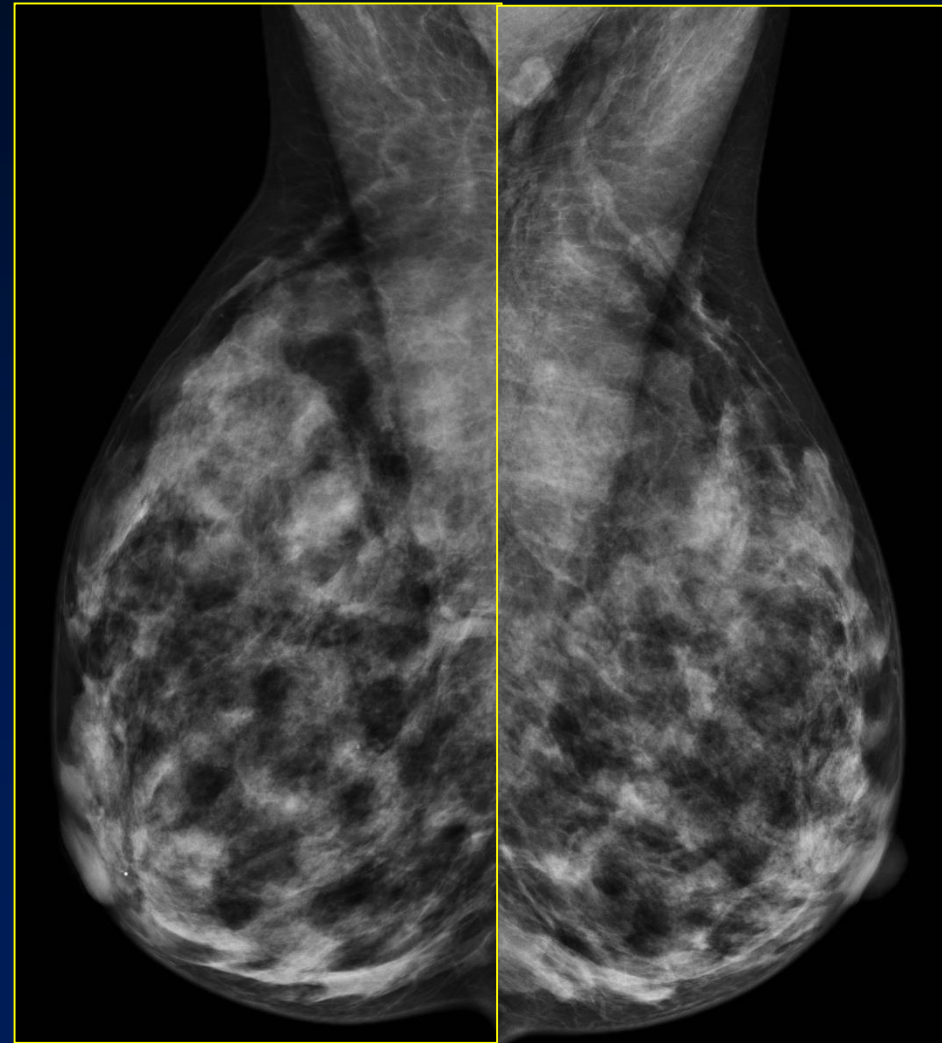
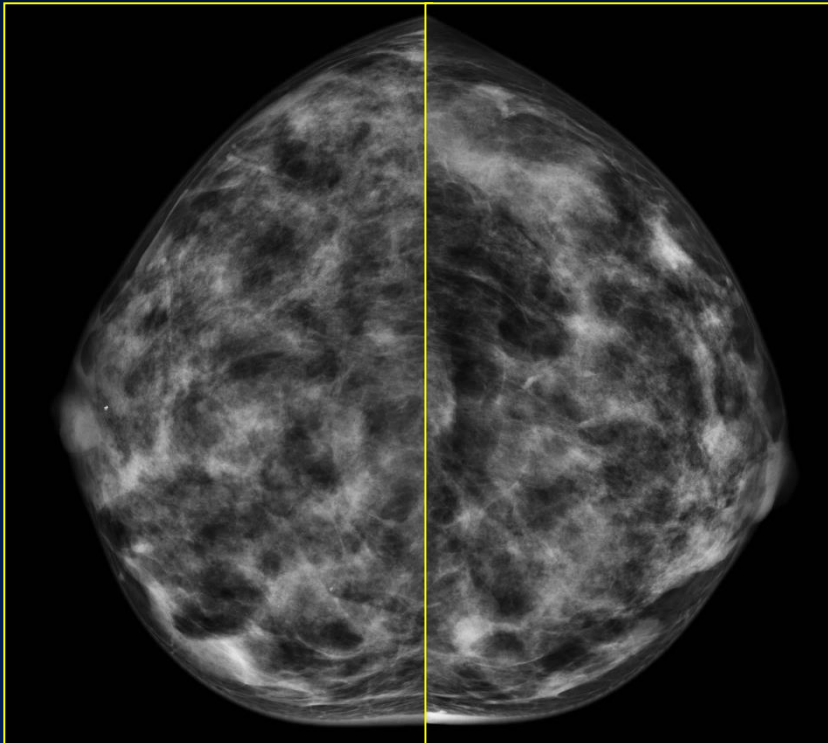
2nd look ultrasound – Caso 2

43 anni

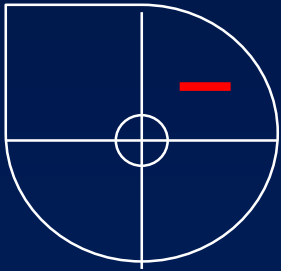
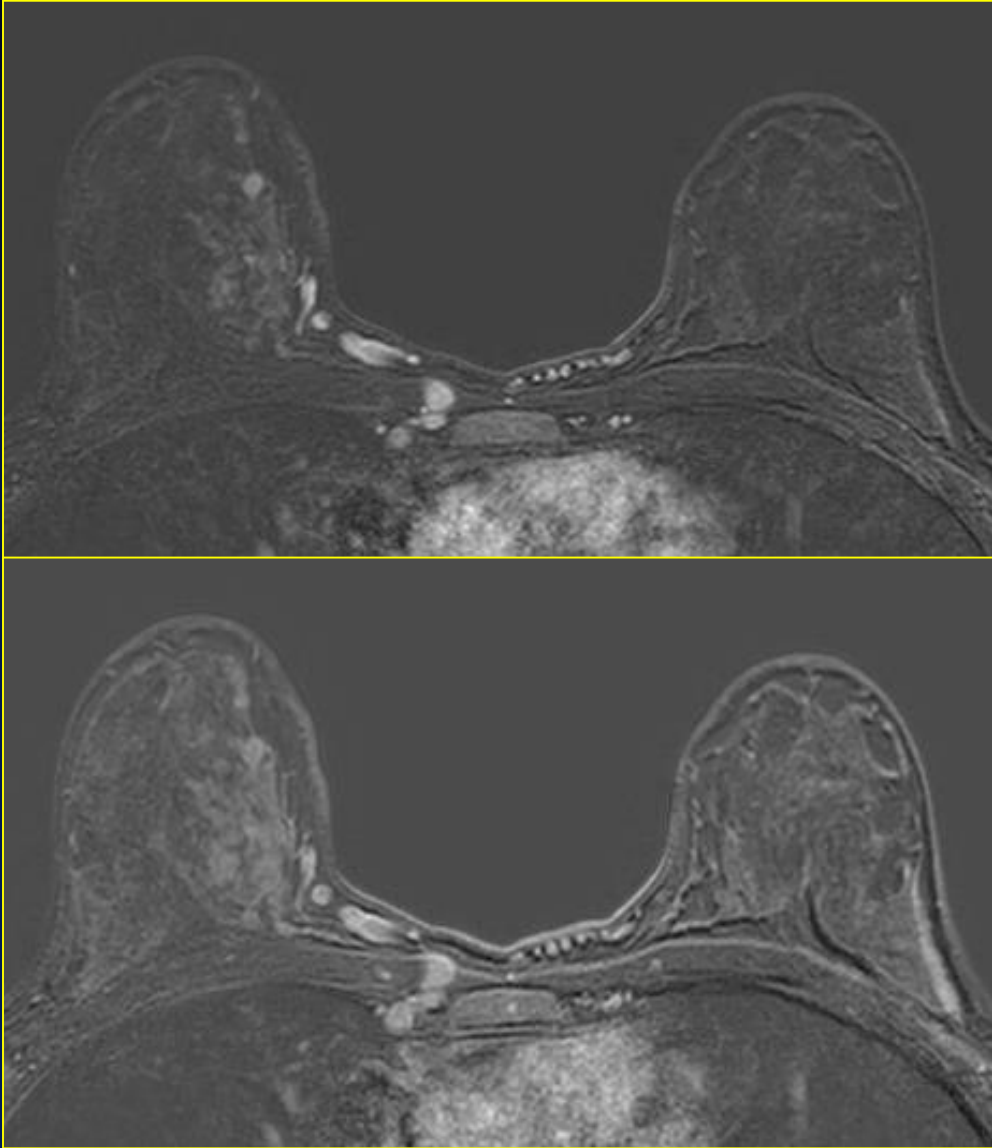
Secrezione ematica destra

Mammografia ed ecografia –

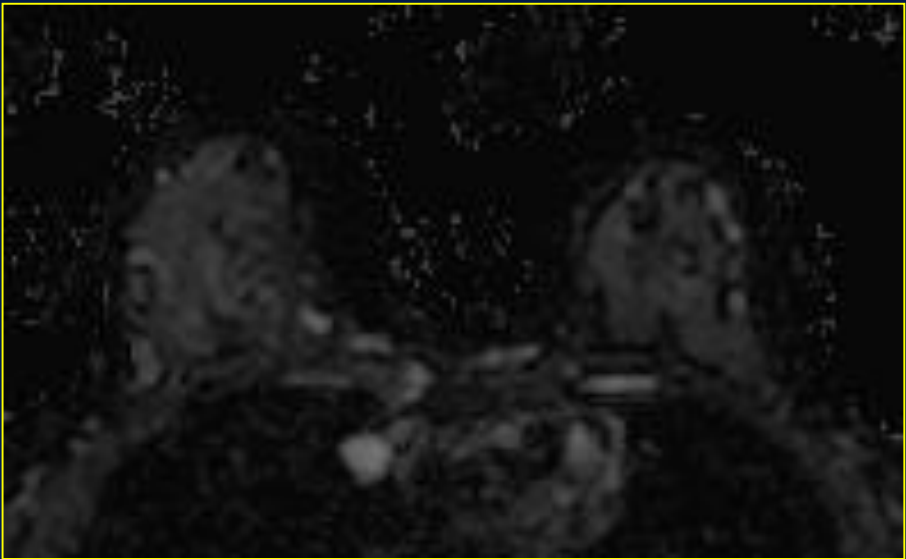
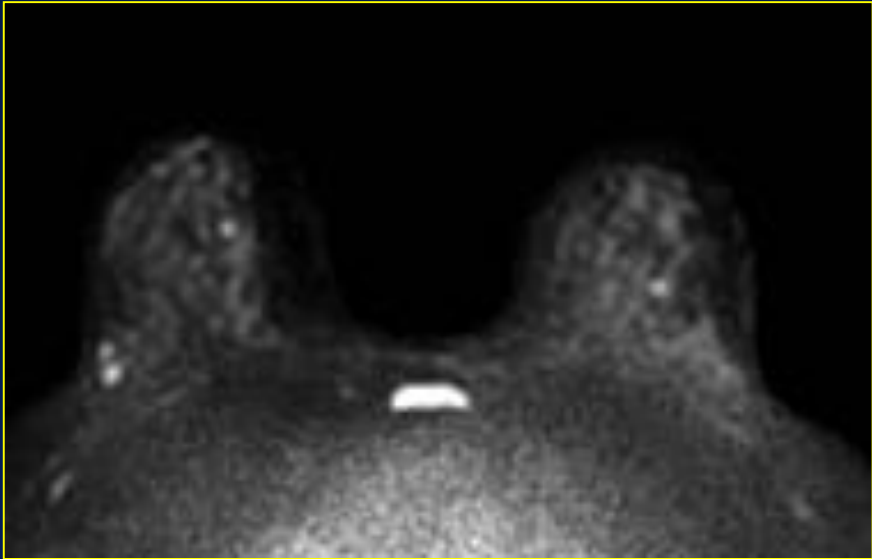
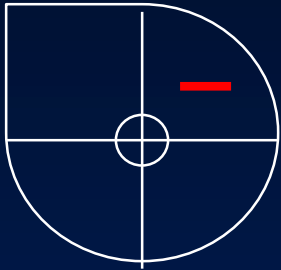
Striscio CTM+



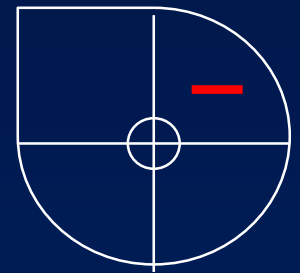
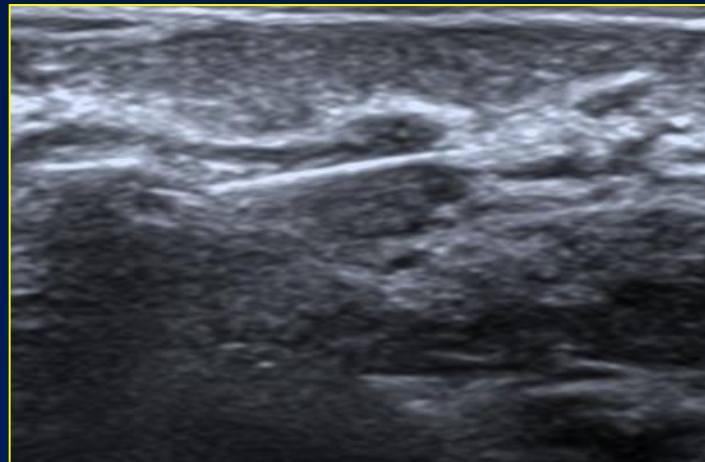
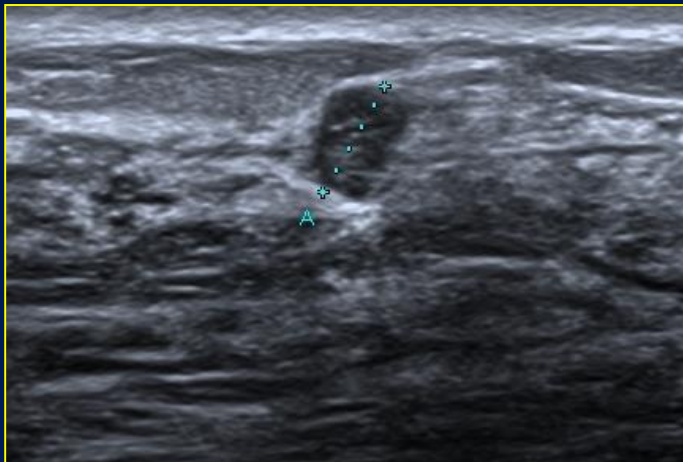
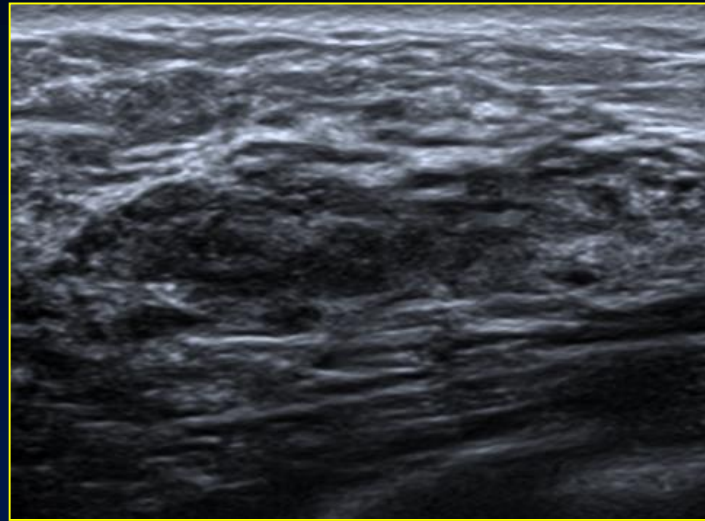
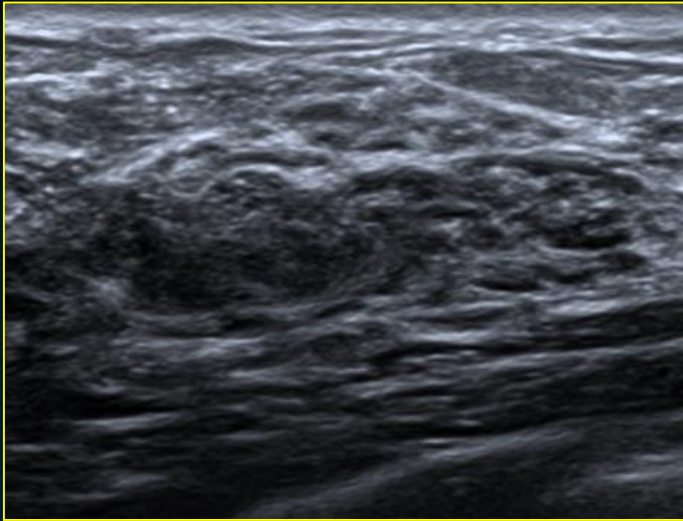
2nd look ultrasound – Caso 2



2nd look ultrasound – Caso 2



2nd look ultrasound – Caso 2



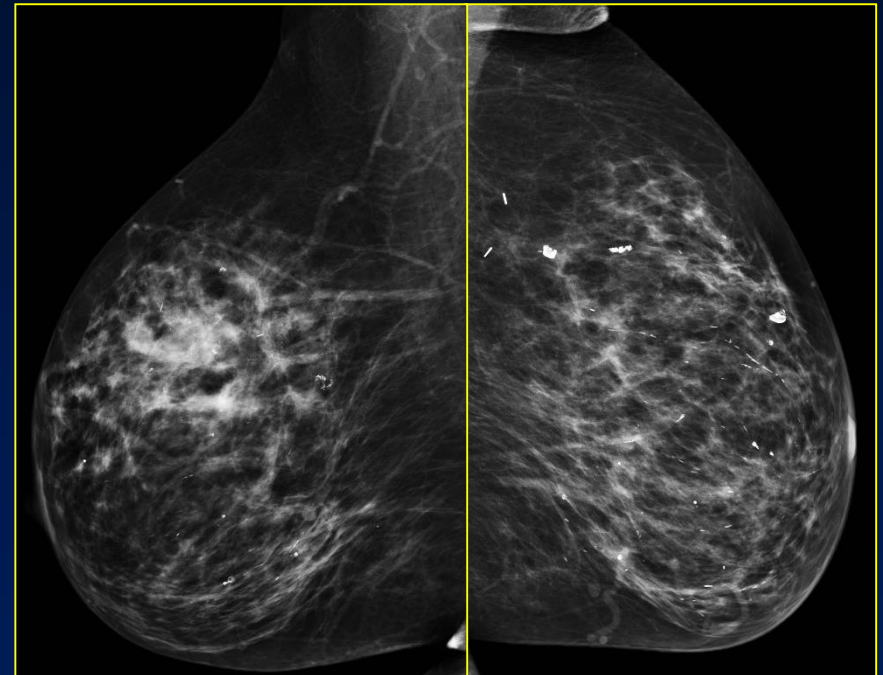
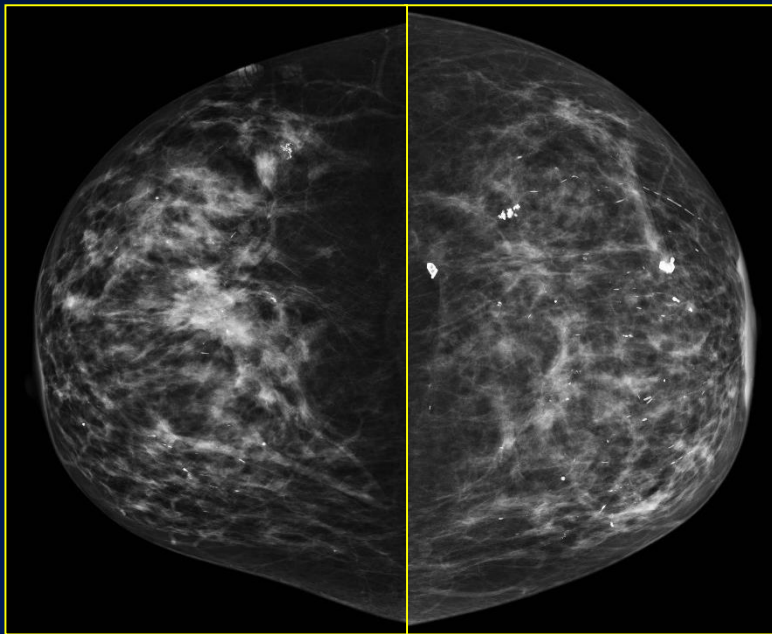
E.I. carcinoma duttale infiltrante con estesa componente in situ

2nd look ultrasound – Caso 3

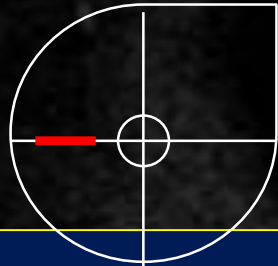
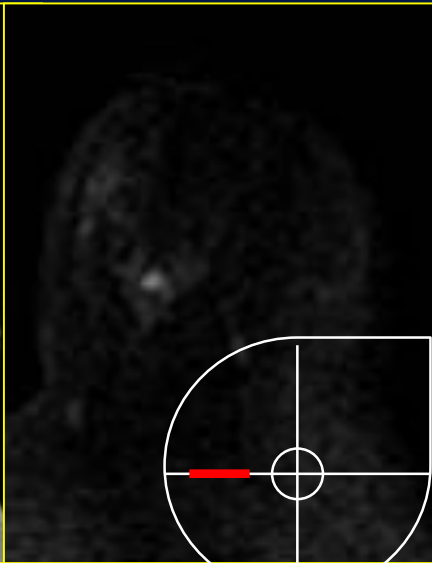
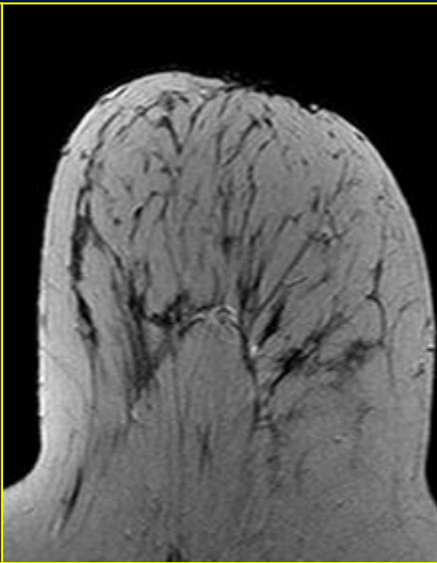
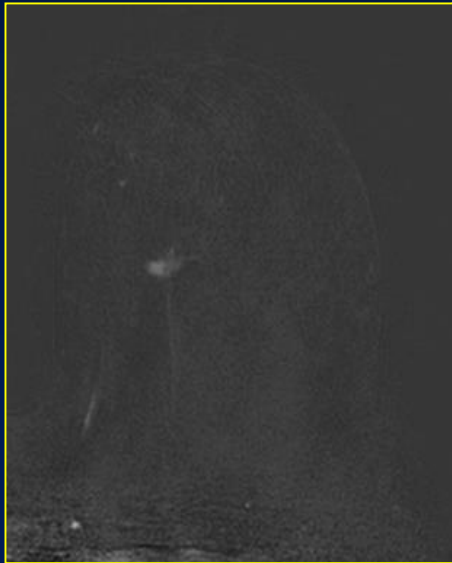
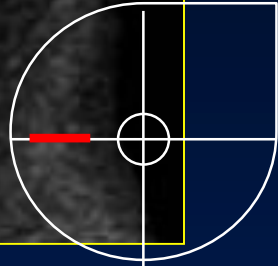
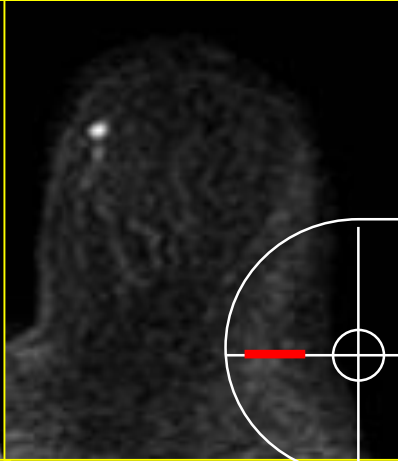
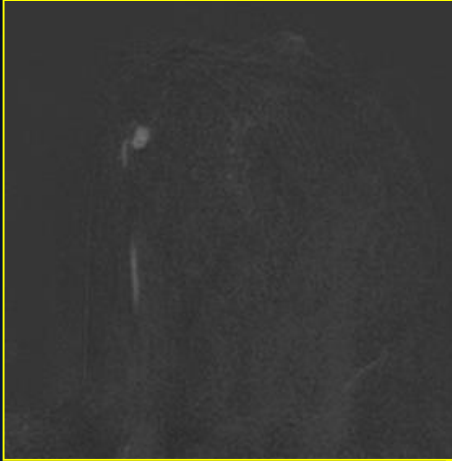
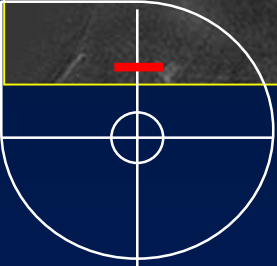
74 anni

Pregressa QUART sinistra

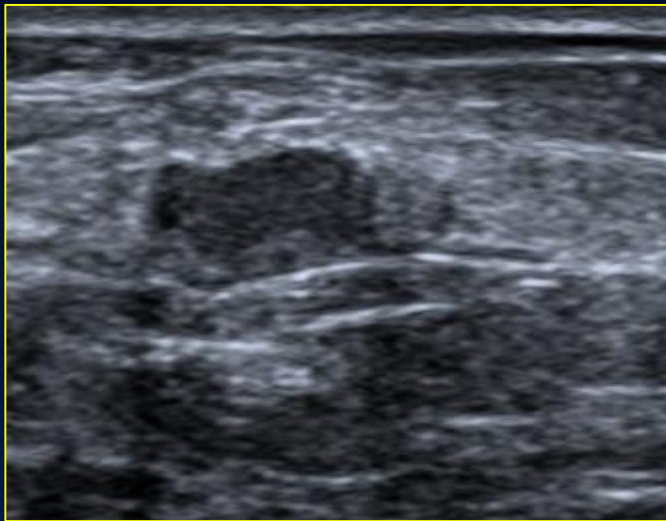
Recente riscontro di neoplasia
multifocale destra



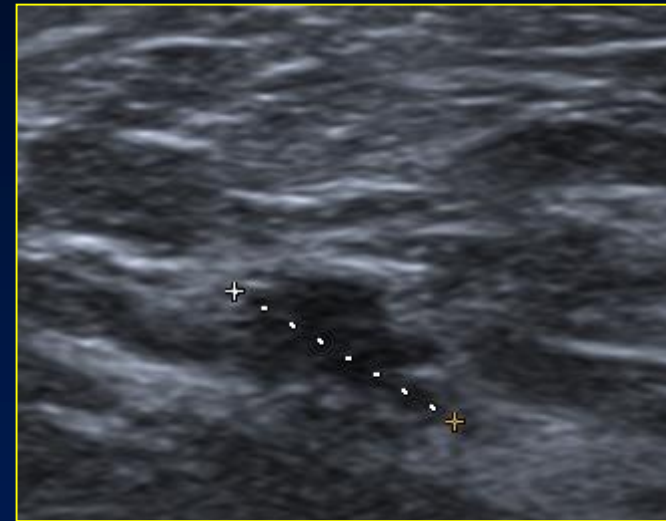
2nd look ultrasound – Caso 3



2nd look ultrasound – Caso 3

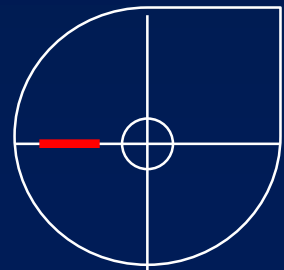


A



B

E.I. A) Metastasi di carcinoma duttale infiltrante
B) Carcinoma duttale infiltrante

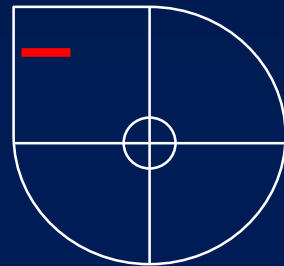
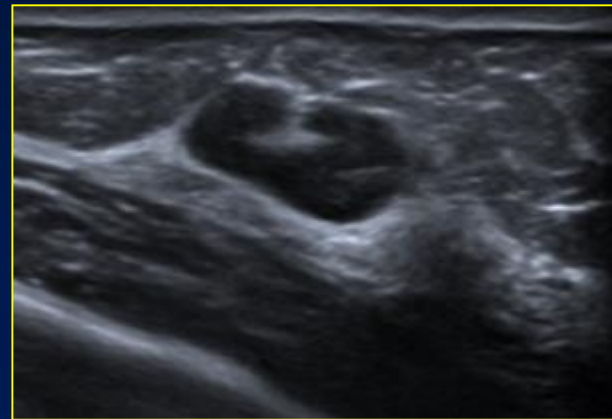


2nd look ultrasound – Caso 4

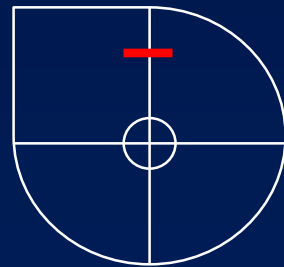
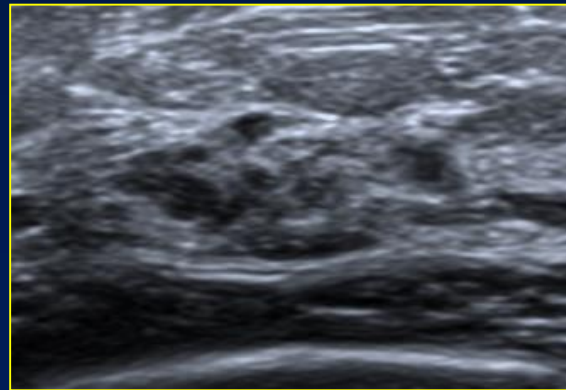
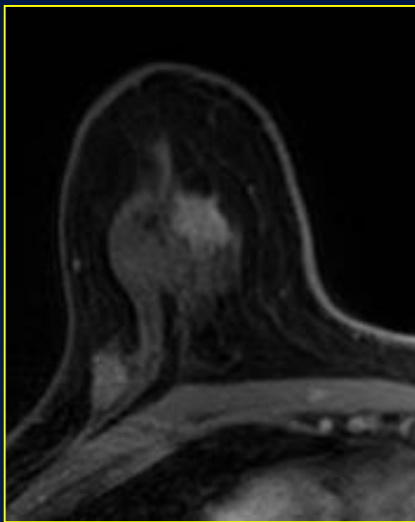
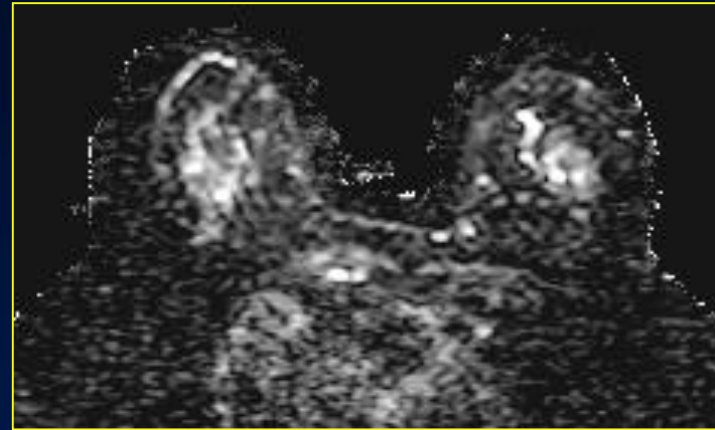
63 anni

FNAB “nodulo” QSE destro

E.C. Cellule di Carcinoma Lobulare



2nd look ultrasound – Caso 4



E.I. Carcinoma Lobulare Infiltrante

Conclusioni

Tecnica utile ed efficace

- ✓ Operatore dipendente
- ✓ Meglio visibili le lesioni di grandi dimensioni, mass-like e maligne
- ✓ Problemi di matching
- ✓ Identificare reperi (capezzolo, cisti, noduli..)

Grazie per l'attenzione!

venturini.elena@hsr.it



Come nani sulle
spalle di giganti

Con 2nd look US vediamo più lontano
grazie all'elevata sensibilità della RM

Grazie per l'attenzione!

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