

# BREAST MRI: BASES AND CASES



## BIOPSIA RM

**21 SETTEMBRE 2018**  
**SEGRATE (MI)**  
HOTEL NH MILANO 2  
via Fratelli Cervi  
SEGRATE (MI)



**Dott. Claudio Losio**  
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*Università Vita-Salute San Raffaele*  
*IRCCS Ospedale San Raffaele, Milano*



- ALTA SENSIBILITA' nella detezione del Ca mammario

- SPECIFICITA' variabile

Sens: 90% Spec: 72%  
Peters et al, Radiology 2008



Difficoltà di caratterizzazione lesioni dotate di enhancement



Necessità indagini di approfondimento e/o follow-up

Aumento costi e pressione psicologica su pz

## Problema falsi positivi

### Soluzioni

- Corretta indicazione all' esame
- Corretto timing (ciclo, 2-3 mesi dopo sospensione HRT)
- Qualità d' esame (applicare tutti i criteri semeiotici!)
- Sequenze aggiuntive (spettroscopia H e DWI)
- Correlazione con imaging tradizionale
- Personalizzazione su profilo di rischio singola paziente
- ! Buon senso !



- BIOPSIA RM-GUIDATA (lesioni esclusivamente RM-visibili)

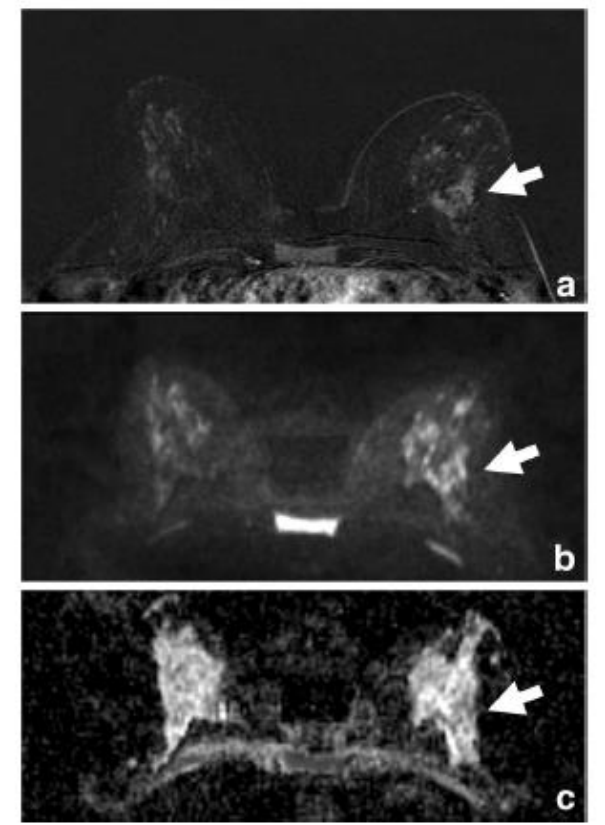
Eur Radiol (2014) 24:1204–1210

DOI 10.1007/s00330-014-3153-6

BREAST

## MRI-only lesions: application of diffusion-weighted imaging obviates unnecessary MR-guided breast biopsies

Claudio Spick • Katja Pinker-Domenig •  
Margaretha Rudas • Thomas H. Helbich •  
Pascal A. Baltzer



Caratterizzazione con ADC puo' ridurre  
del 30% le biopsie per patologia benigna

# RM mammaria: DWI



Magnetic Resonance Imaging 38 (2017) 1–5



Contents lists available at ScienceDirect

Magnetic Resonance Imaging

journal homepage: [www.mrijournal.com](http://www.mrijournal.com)



Technical note

MRI-guided breast vacuum biopsy: Localization of the lesion without contrast-agent application using diffusion-weighted imaging

Nicole Berger<sup>a,\*</sup>, Zsuzsanna Varga<sup>b</sup>, Thomas Frauenfelder<sup>a</sup>, Andreas Boss<sup>a</sup>

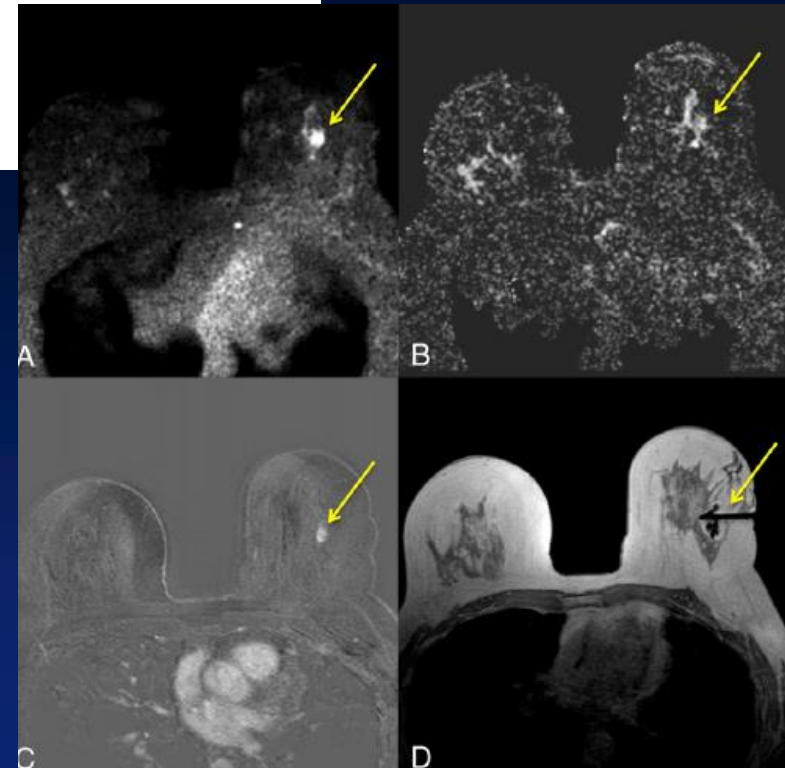
<sup>a</sup> Institute of Diagnostic and Interventional Radiology, University Hospital Zurich, Raemistrasse 100, 8091 Zurich, Switzerland

<sup>b</sup> Institute for Surgical Pathology, University Hospital Zurich, Raemistrasse 100, 8091 Zurich, Switzerland



Centratura senza mdc

(risolve problema vanishing-target)



## SECOND LOOK ECOGRAFICO (vs DWI)

### ECR 2013 / C-2545

Diffusion Weighted Imaging vs targeted ultrasound in the characterization of additional lesions detected with pre-operative breast MRI.

Congress: ECR 2013

Poster No.: C-2545

Type: Scientific Exhibit

Keywords: Breast, MR-Diffusion/Perfusion, Ultrasound, Diagnostic procedure, Pathology

Authors: E. Schiani, G. Cristel, E. Venturini, M. M. Panzeri, C. Losio, S. Tacchini, M. G. Rodighiero, F. De Cobelli, A. Del Maschio; Milan/IT

DOI: [10.1594/ecr2013/C-2545](https://doi.org/10.1594/ecr2013/C-2545)

DOI-Link: <http://dx.doi.org/10.1594/ecr2013/C-2545>

Accuratezza DWI (ADC) >> second look (93 vs 66%)

Limite DWI: lesioni  $\leq$  5 mm (superiorità US)

## RACCOMANDAZIONI

- GUIDA ECO PREFERIBILE
- LESIONE BEN VISIBILE ALLA RM
- LESIONE RIPRODUCIBILE \*
- SECOND LOOK US negativo
- BIRADS IV-V (III)
- SE LESIONI EQUIVOCHE ⇒ RIPETERE RM
- PZ COLLABORANTE (immobilizzazione per circa 1h)

*DIFFERENTI TECNICHE ACQUISIZIONE, QUALITA' IMMAGINI  
NON SEMPRE OTTIMALE*

**(RIPETERE RM PRIMA DELLA BIOPSIA)**

## CONTROINDICAZIONI

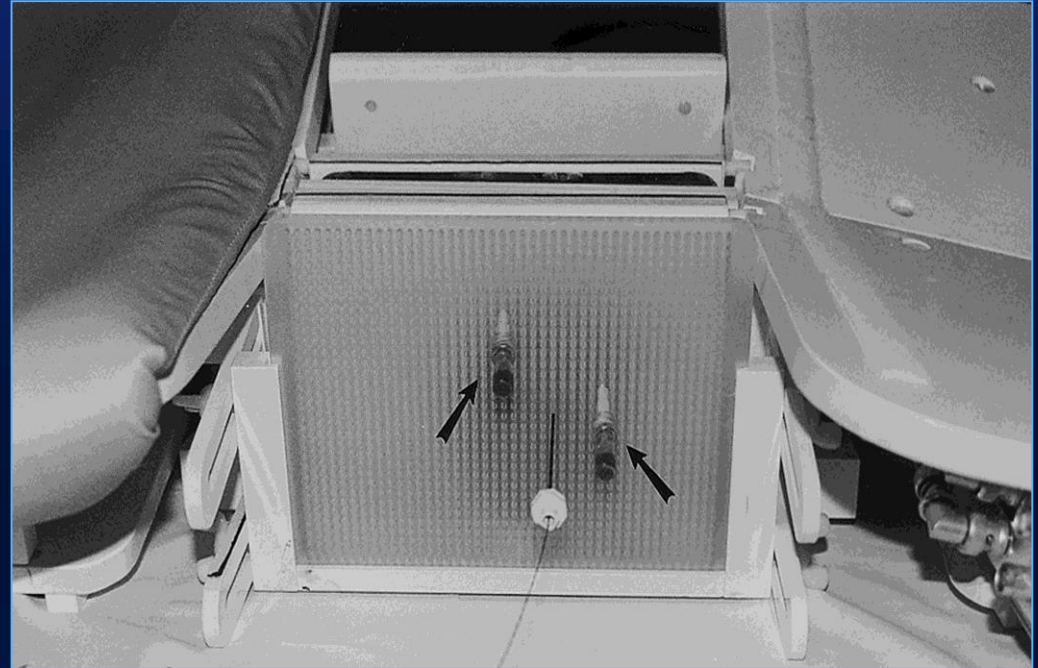
- A RM IN GENERALE (PACEMAKER, clips per aneurismi intracranici, espansore mammario)
- INSUFFICIENZA RENALE (no problem con mdc a struttura ciclica)
- PZ NON COLLABORANTE
- PZ ALLERGICI (DESENSIBILIZZAZIONE)
- LESIONI MOLTO PROFONDE (o seni piccoli)
- DISTURBI DELLA COAGULAZIONE
- IMPIANTI PROTESICI



## SISTEMI DI CENTRATURA

OREL

(sistema HUP)

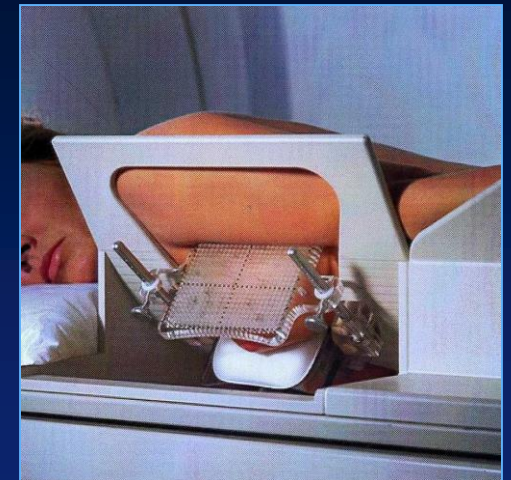
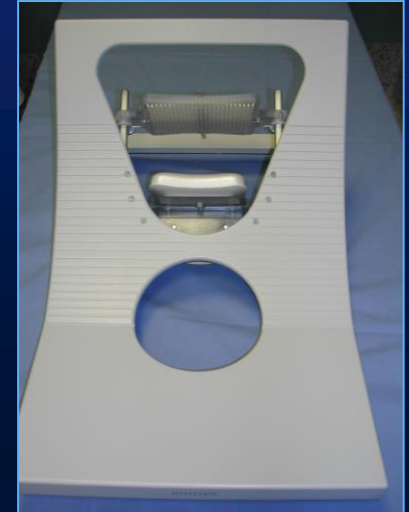


- sistema multibobina: laterale + mediale

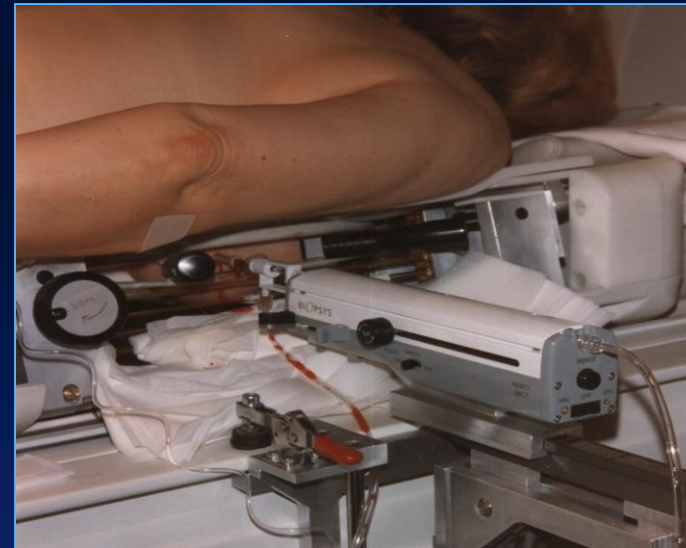
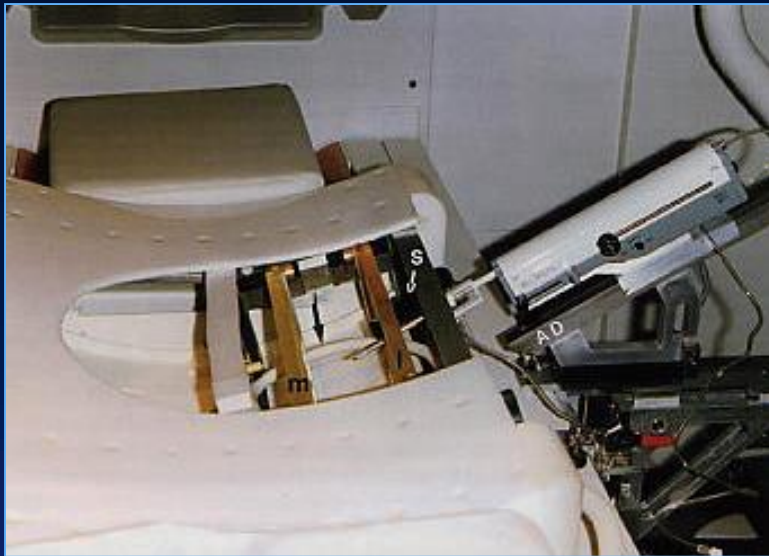
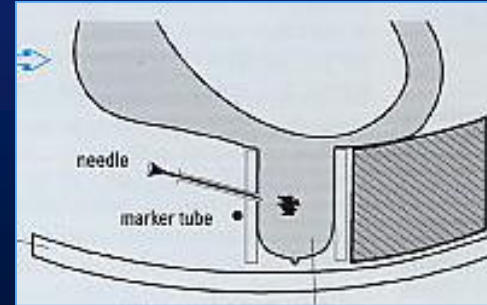
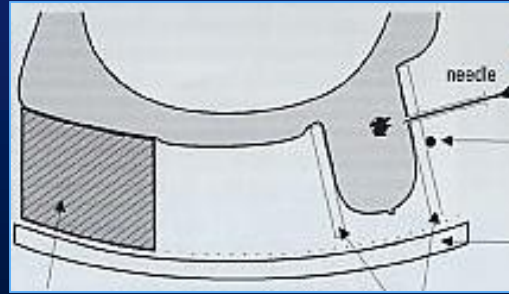
## SISTEMI DI CENTRATURA

Kuhl, Radiology 1997

Panizza, Radiol Med 2003

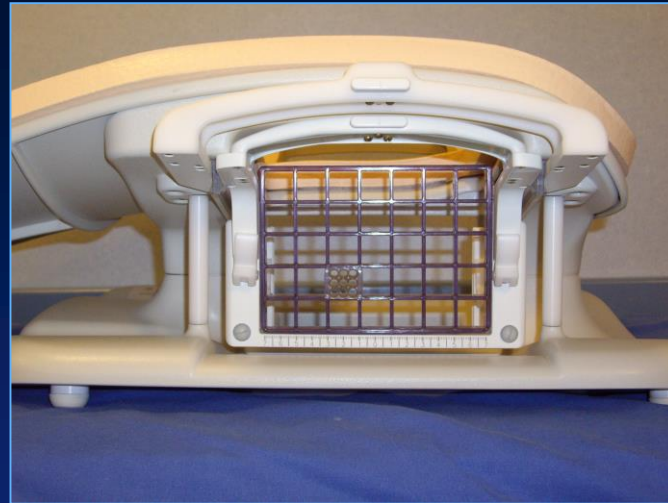
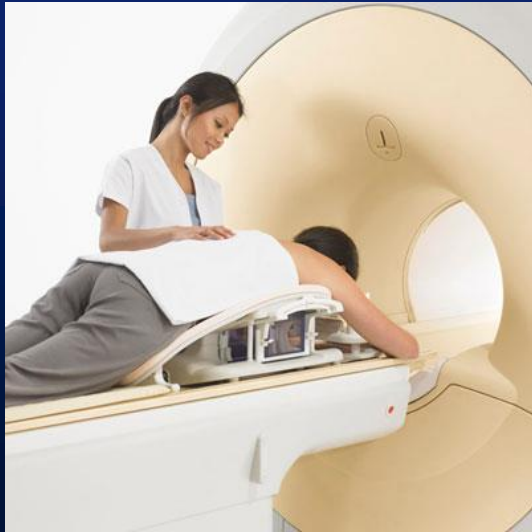


## Heywang



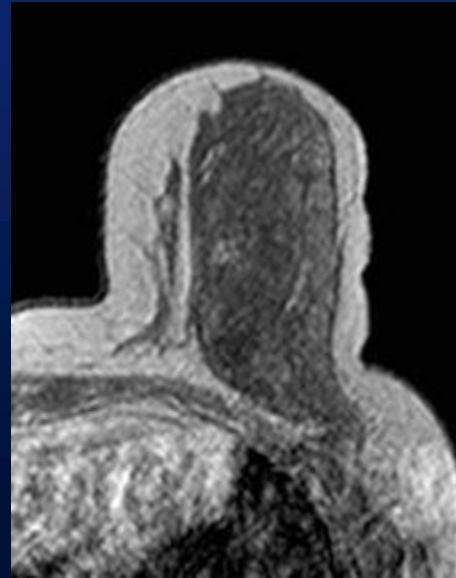
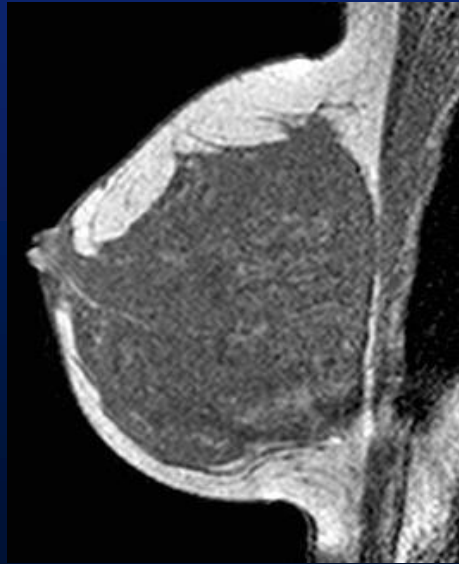


# BIOPSIA RM

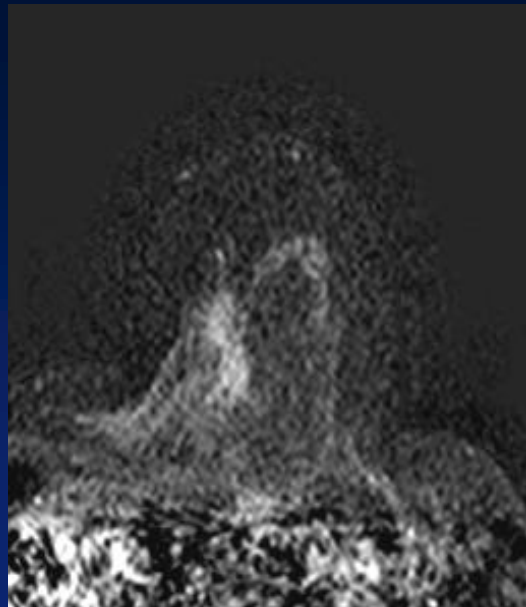


# BIOPSIA RM

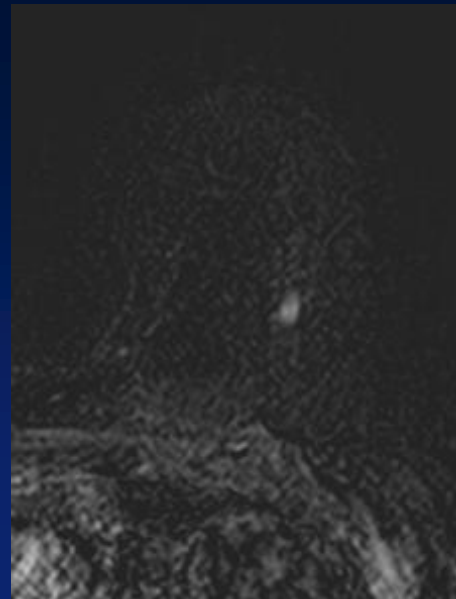
Centratura



> 1 cm



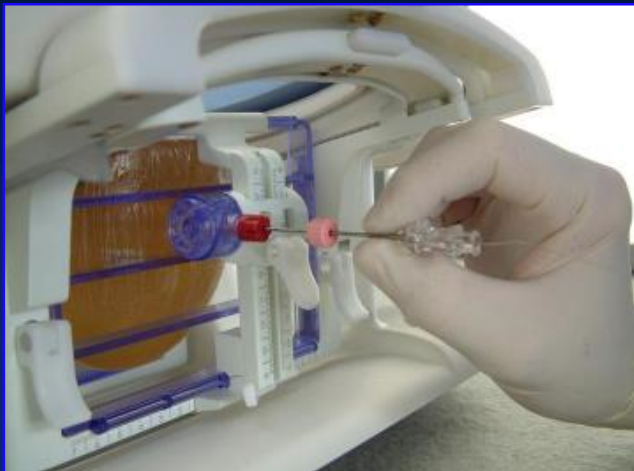
< 1 cm



## CAD

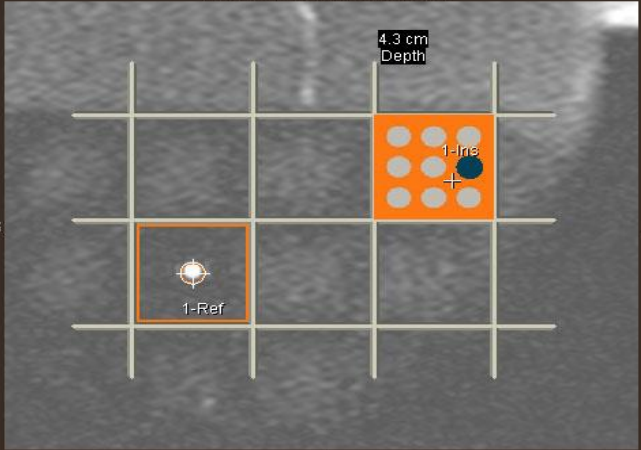
Calcola con precisione e rapidamente i rapporti tra griglia, lesione e repere

- » Sede di inserimento dell'ago
- » Profondità



**SureLoc™**

Lateral view of left breast





4.3 cm  
Depth

1-Ins

1-Ref

S

A



Move relative to the reference point:		
Distance	Direction	Toward
1.8 cm (1 blk*)	Posterior	Chest
4.3 cm (2 blk*)	Inferior	Foot
4.3 cm	Depth	(includes guide)

Method **Grid**

Block **Suros**

\* Assumes Reference is in center of grid block

New SureLoc... Print... Snapshot Images Close

## Scelta sistema di biopsia

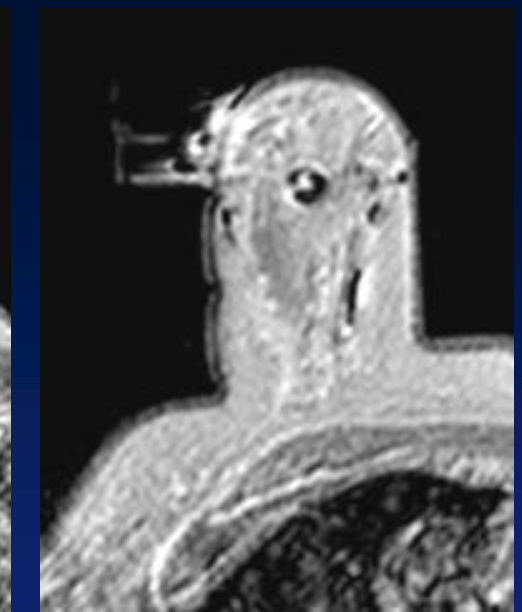
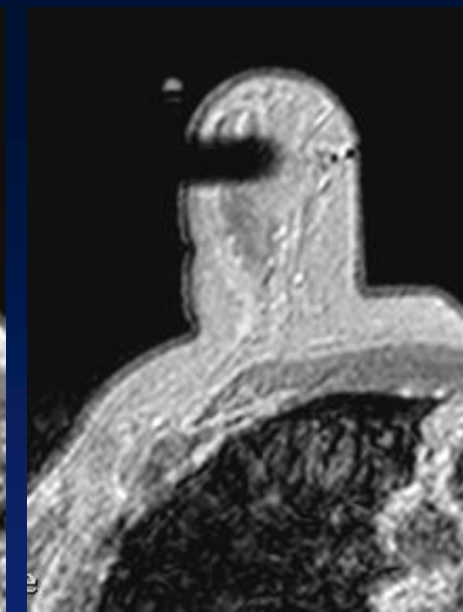
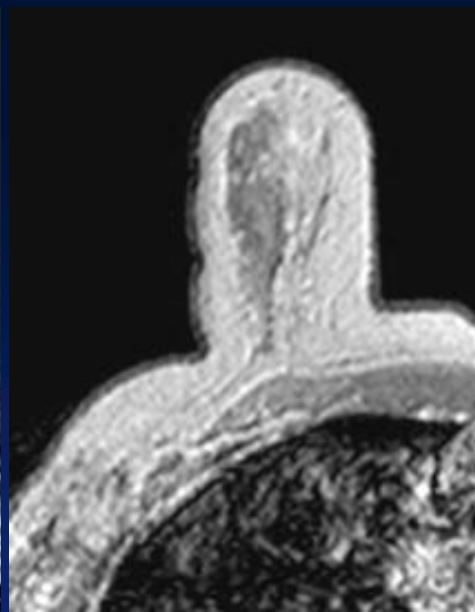
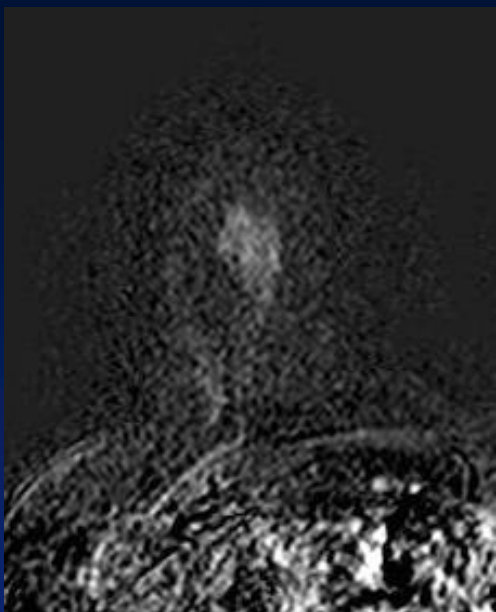
- Ago tru-cut (economico, lesioni > 1 cm)
- Sistema fully RM compatible
- Ago coassiale 12G (2.5 mm) x 9.1 cm
- Ago automatico 14G (2.1 mm) x 10 cm
- Cubetto per griglia
- Clip





# BIOPSIA RM

## Tru-cut





## MR-guided stereotactic breast biopsy using a mixed ferromagnetic-nonmagnetic coaxial system with 12- to 18-gauge needles: clinical experience and long-term outcome.

[Belloni E](#)<sup>1</sup>, [Panizza P](#), [Ravelli S](#), [De Cobelli E](#), [Gusmini S](#), [Losio C](#), [Sassi I](#), [Perseghin G](#), [Del Maschio A](#).

 Author information

## 70 biopsie

Diametro medio 10.2 mm

41.4% maligni

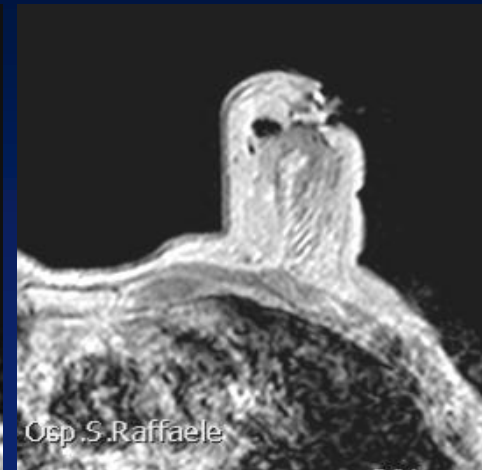
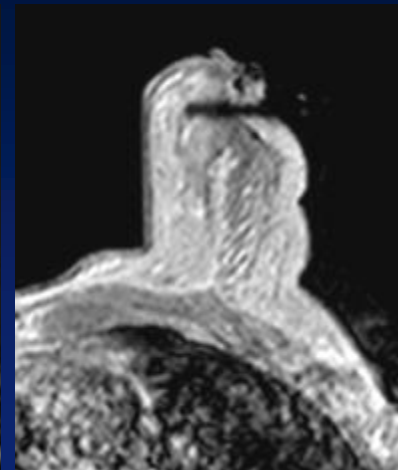
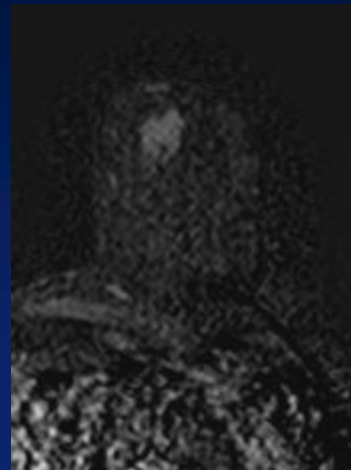
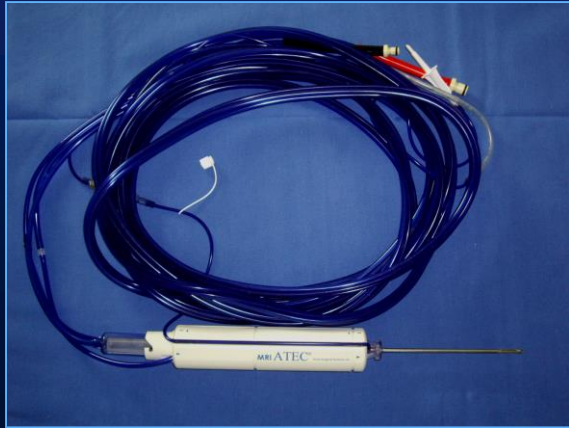
58.6% benigni

2 Falsi negativi (5 e 7 mm)

guida RM con Core Biopsy  
(4-12 campioni 14, 16, 18 G)

# BIOPSIA RM

- Vacuum assisted breast biopsy (VABB, 9G, lesioni < 1 cm)



# BIOPSIA RM



STUDIO MULTICENTRICO EUROPEO guida RM con VABB

538 lesioni sospette (20 campioni 11G)

21 prelievi non riusciti

96% eseguite con successo

27% maligni

3% iperplasia duttale atipica (5/17 >>>CDIS a chirurgia!)

70% benigni

No Falsi negativi

PPV correlato alle indicazioni alla RM

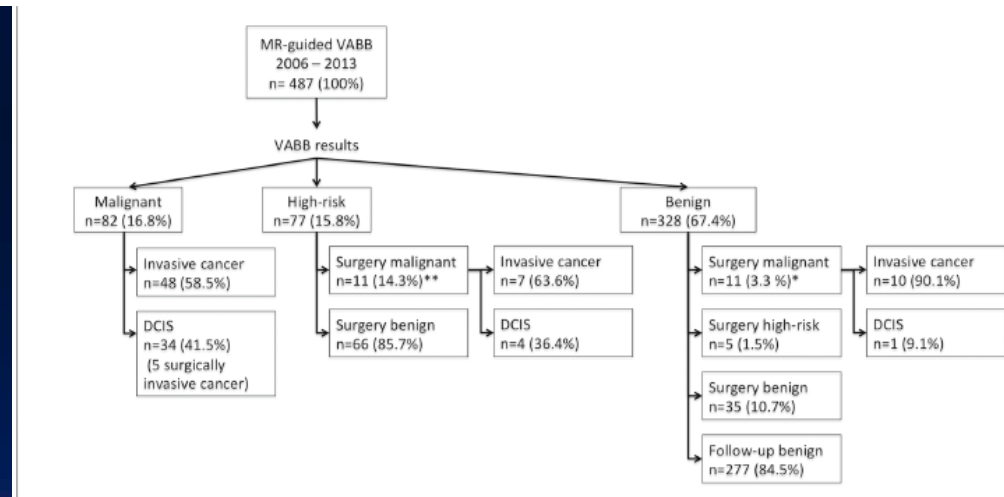
Ridotto tasso di complicanze

Perlet et al, Cancer 2006

BREAST

## MR-guided vacuum-assisted breast biopsy of MRI-only lesions: a single center experience

Claudio Spick<sup>1</sup> · Melanie Scherthner<sup>1</sup> · Katja Pinker<sup>1</sup> ·  
Panagiotis Kapetas<sup>1</sup> · Maria Bernathova<sup>1</sup> · Stephan H. Polanec<sup>1</sup> · Hubert Bickel<sup>1</sup> ·  
Georg J. Wengert<sup>1</sup> · Margaretha Rudas<sup>2</sup> · Thomas H. Helbich<sup>1</sup> · Pascal A. Baltzer<sup>1</sup>



14.3% delle High risk upgragate a K

14.7% dei CDIs upgradati a CDI

No differenze tra sistemi

e calibri diversi (8, 9 e 10G)

## Underestimation Rate at MR Imaging–guided Vacuum- assisted Breast Biopsy: A Multi- Institutional Retrospective Study of 1509 Breast Biopsies<sup>1</sup>

Radiology

Cécile Verheyden, MD  
Emma Pages-Bouic, MD  
Corinne Balleyguier, MD  
Pascal Cherel, MD  
Domenico Lepori, MD  
Guillaume Laffargue, MD  
Isabelle Doutriaux, MD  
Aurélie Jalaguier, MD  
Edouard Poncelet, MD  
Ingrid Millet, MD, PhD  
Isabelle Thomassin-Naggara, MD, PhD  
Patrice Taourel, MD, PhD

Tasso di sottostima per ADH e  
DCIS intorno al 25%

>>> mass vs non-mass

<<< per aghi di elevato calibro  
(preferire 9 e 10G a 7 e 8G)



## Complete Excision of the MRI Target Lesion at MRI-Guided Vacuum-Assisted Biopsy of Breast Cancer

Jung-Min Lee<sup>1</sup>  
Jennifer B. Kaplan<sup>1</sup>  
Melissa P. Murray<sup>2</sup>  
Laura Liberman<sup>1</sup>

30 % biopsie VABB per ca  completa rimozione target RM

64% margini cmq positivi alla chirurgia

36 pazienti inviate per biopsia RM da altri centri:

1) rivalutazione critica immagini RM

2) targeted US

-5/36 ripetizione RM per bassa qualità; 1 su 5 lesione confermata e biopsiata (benigna)

-10/36 + a US, **biopsia US in 7/10: 5 K, 2 B**

-21/36 pz posizionate per RM di centratura

4/21 lesione non trovata

**17/21 tutte biopsiate con successo (5 K, 10 B, 2 borderline)**

Nostra esperienza (SIRM 2013)

81 pazienti candidate a biopsia RM:

Interne vs Esterne

Tasso di non esecuzione: > pz esterne (26 vs 14%)

Cause di non esecuzione:

-non riproducibilità del target (80% pz esterne)

-lesione eco-visibile (66% pz esterne)

-lesione riclassificata come non sospetta (100% pz esterne)

Tasso di malignità > pz interne (37.5 vs 17%)

Falso positivo più frequente: adenosi

Nostra esperienza (SIRM 2016)



Sandra B. Brennan, MD  
Janice S. Sung, MD  
D. David Dershaw, MD  
Laura Liberman, MD  
Elizabeth A. Morris, MD

## Cancellation of MR Imaging– guided Breast Biopsy Due to Lesion Nonvisualization: Frequency and Follow-Up<sup>1</sup>

Radiology

907 lesioni sospette inviate a bx RM

8% scomparsa del target (background enhancement, < 1 cm)

Prudenziale il monitoraggio (2% sono K al successivo monitoraggio)

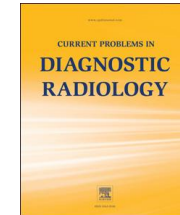
Current Problems in Diagnostic Radiology 45 (2016) 193–204



ELSEVIER

## Current Problems in Diagnostic Radiology

journal homepage: [www.cpdjournal.com](http://www.cpdjournal.com)



### Breast Biopsies Under Magnetic Resonance Imaging Guidance: Challenges of an Essential but Imperfect Technique

Marie-Claude Chevrier, MD<sup>a</sup>, Julie David, MD<sup>b</sup>, Mona El Khoury, MD<sup>b</sup>, Lucie Lalonde, MD<sup>b</sup>, Maude Labelle, MD<sup>b</sup>, Isabelle Trop, MD, MPH<sup>b,\*</sup>

Tasso di sottostima BX RM > rispetto a VABB stereotassico

In caso di riscontro B3 è consigliabile chirurgia

## Take home message

- BX RM: punto di arrivo dell' iter diagnostico senologico
- Procrastinabile? (follow-up RM)
- Adeguata tecnologia e learning curve  
Utilizzo CAD (< tempi, > precisione sampling)  
Aghi VABB da preferire
- Radiologi senologi multimodalità

- Necessità di centri di riferimento e loro promozione (SIRM)
- Maggior "educazione" all' uso corretto e all' interpretazione della RM mammaria
- Ritorniamo alla "cura" della paziente (no medicina difensiva)



Grazie!



[losio.claudio@hsr.it](mailto:losio.claudio@hsr.it)