CHEMIOTERAPIA PREOPERATORIA

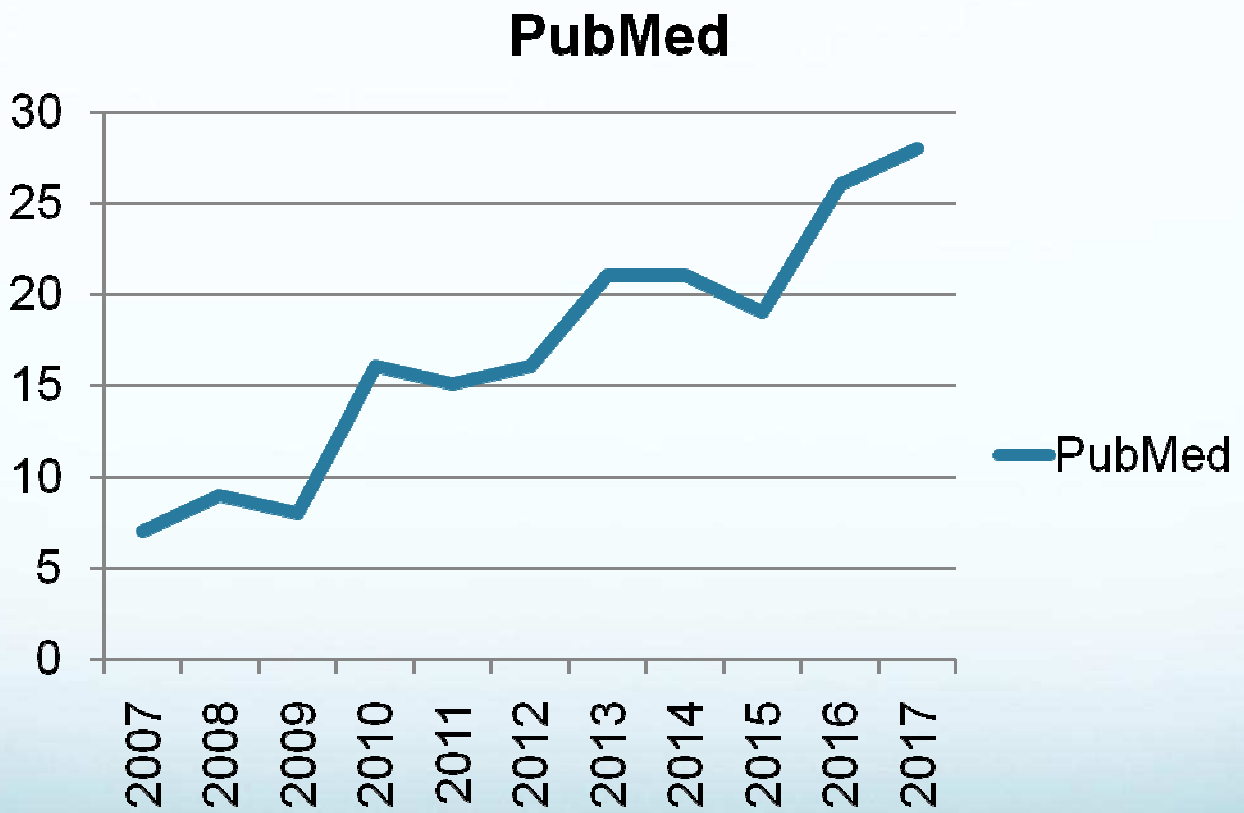
Valutazione della risposta: RM

Vincenzo Marra

Direttore SC Radiologia Ospedale Sant'Anna - Torino

Torino 26 settembre 2017

Criteri di ricerca nel titolo:
[(MRI) or (Magnetic Resonance)] and (Breast) and (neoadjuvant)



Cancer

1996

Evaluation of Neoadjuvant Chemotherapeutic Response of Locally Advanced Breast Cancer by Magnetic Resonance Imaging

Dana C. Abraham, M.D.[1]
Ronald C. Jones, M.D.[2]
Stephen E. Jones, M.D.[3]
J. Harold Cheek, M.D.[2]
George N. Peters, M.D.[2]
Sally M. Knox, M.D.[2]
Michael D. Grant, M.D.[2]
David W. Hampe, M.D.[2]
Daniel A. Savino, M.D.[4]
Steven E. Harms, M.D.[5]

BACKGROUND. The implementation of new treatment protocols for locally advanced breast cancer is currently limited by inaccurate evaluation of response to neoadjuvant chemotherapy. A recently developed dedicated breast magnetic resonance imaging (MRI) method (RODEO MRI) was evaluated as a tool for determining tumor response and extent of residual disease after neoadjuvant chemotherapy.

METHODS. Thirty-nine patients with Stage II, III, or IV breast carcinoma were prospectively evaluated prior to and following neoadjuvant chemotherapy by MRI, physical examination, and mammography. Assessment of response determined by the three methods was compared. In addition, detailed pathologic correlation of

PRIMI ANNI 2000:

RM dinamica (con mdc):
-più accurata di mx
-più accurata di eco
-valutazione precoce in corso di trattamento

Eur Radiol (2005) 15: 1224–1233
DOI 10.1007/s00330-005-2656-6

BREAST

Filippo Montemurro
Laura Martincich
Giovanni De Rosa
Stefano Cirillo
Vincenzo Marra
Nicoletta Biglia
Marco Gatti
Piero Sismondi
Massimo Aglietta
Daniele Regge

Dynamic contrast-enhanced MRI and sonography in patients receiving primary chemotherapy for breast cancer

Recommendations (EuSoMa 2010)

1) MRI does not have a role in the assessment of treatment options in patients with inoperable breast cancer at presentation.
2) Pretreatment breast MRI should be performed in patients with large potentially operable breast cancer **before the first course of NAC**, at the condition that performing MRI does not significantly postpone NAC initiation
3) Post-NAC breast MRI should preferably be performed **2 weeks after the last NAC cycle** and **within 2 weeks before surgery**; treatment delay due to preoperative MRI should not be larger than 1 month
4) Variations between pre- and post-NAC should be based on concomitant evaluation of both pre- and post-NAC MRI examinations; **even very low enhancement located at the primary tumour site should be considered as a sign for residual disease.**
5) Measurement of residual disease after NAC should be performed according to RECIST or WHO criteria; multifocal or multicentric disease should be evaluated by summing the largest diameter of the visible tumours.
6) Caution in interpreting MRI is recommended when patients are treated with taxane or bevacizumab containing regimens.
7) Presurgical issues such as verification of multifocal or multicentric disease should be handled as explained in the paragraph on preoperative MRI; the ultimate surgical decision should be based on the relative volume of residual tumour compared to that of the affected breast and decided by a multidisciplinary team.
8) In poor responders to NAC, MRI generally confirms the results of clinical and conventional imaging evaluations and may, therefore, not be mandatory.

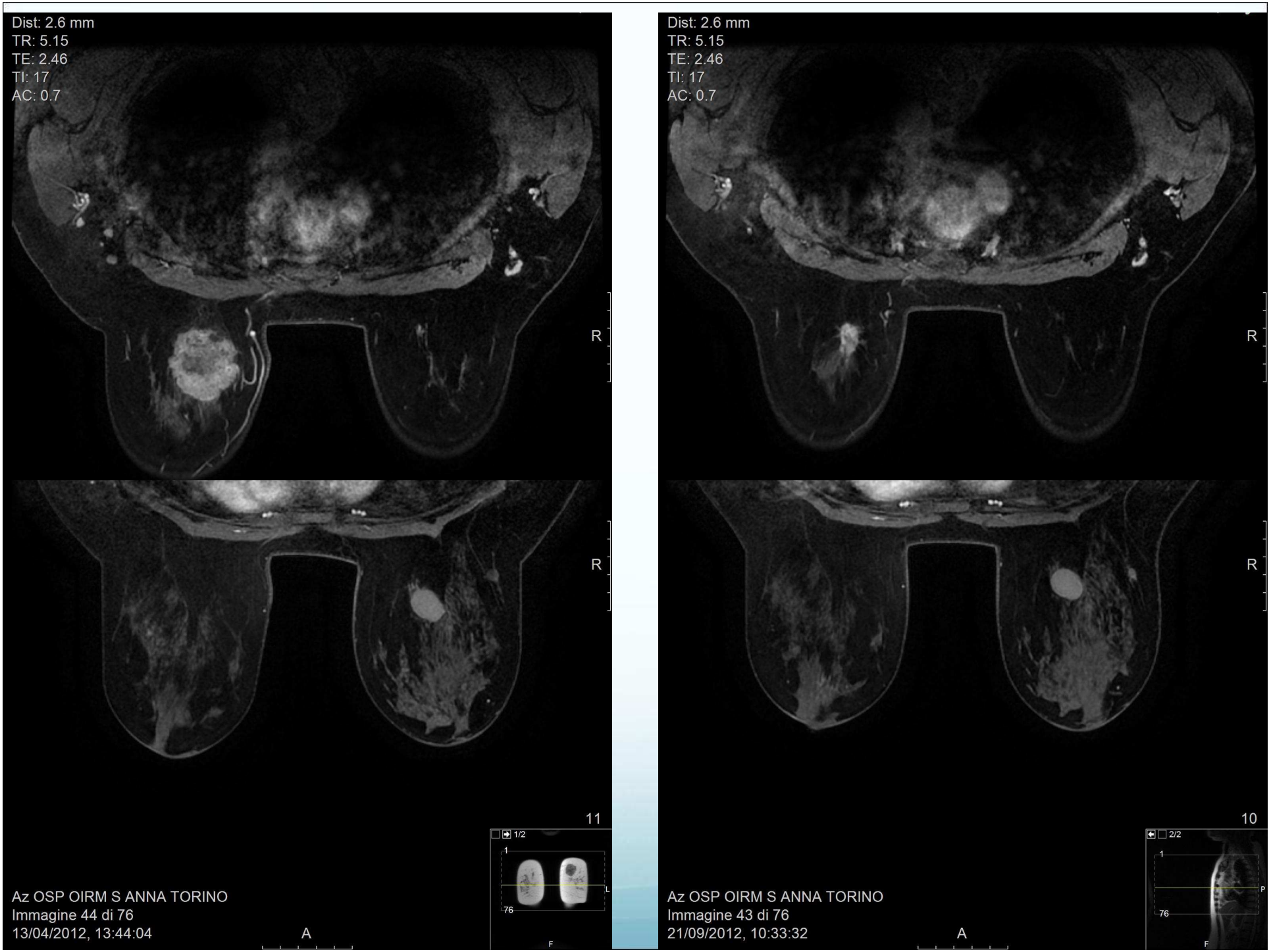

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Immagine 44 di 76
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Immagine 43 di 76
21/09/2012, 10:33:32
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JOURNAL OF MAGNETIC RESONANCE IMAGING 34:1099–1109 (2011)

Original Research

Diffusion-Weighted and Dynamic Contrast-Enhanced MRI in Evaluation of Early Treatment Effects During Neoadjuvant Chemotherapy in Breast Cancer Patients

Line R. Jensen, PhD,[1] Benjamin Garzon, PhD,[1] Mariann G. Heldahl, MS,[1]
Tone F. Bathen, PhD,[1] Steinar Lundgren, MD, PhD,[1,2] and Ingrid S. Gribbestad, PhD[1]*

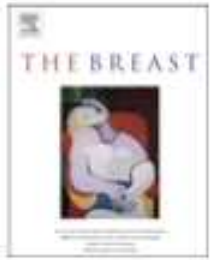
L’imaging in diffusione può evidenziare le modifiche sia in termini di dimensioni che in valore di ADC

The Breast 21 (2012) 669–677

Contents lists available at SciVerse ScienceDirect

The Breast

journal homepage: www.elsevier.com/brst



Original article

Early prediction of pathologic response to neoadjuvant therapy in breast cancer: Systematic review of the accuracy of MRI

M.L. Marinovich [a,*], F. Sardanelli [b], S. Ciatto [c], E. Mamounas [d], M. Brennan [a], P. Macaskill [a], L. Irwig [a], G. von Minckwitz [e], N. Houssami [a]

[a] *Screening and Test Evaluation Program (STEP), Sydney School of Public Health, A27, Edward Ford Building, The University of Sydney, NSW 2006, Australia*
[b] *Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Unità di Radiologia, IRCCS Policlinico San Donato, Piazza E. Malan 2, San Donato Milanese, Milano, Italy*
[c] *U.O. Senologia Clinica e Screening Mammografico, Dipartimento di Radiodiagnostica, APSS, Viale Verona, 30123 Trento, Italy*
[d] *Aultman Health Foundation, 2600 6th St, Canton, OH 44710-1702, United States*
[e] *German Breast Group, Martin-Behaim-Str. 12, 63263 Neu-Isenburg, Germany*

J Natl Cancer Inst. 2013 Mar 6;105(5):321-33. doi: 10.1093/jnci/djs528. Epub 2013 Jan 7.

Meta-analysis of magnetic resonance imaging in detecting residual breast cancer after neoadjuvant therapy.

Marinovich ML, Houssami N, Macaskill P, Sardanelli F, Irwig L, Mamounas EP, von Minckwitz G, Brennan ME, Ciatto S.

CONCLUSIONS:

MRI accurately detects residual tumor after neoadjuvant chemotherapy. Accuracy was lower when pCR was more rigorously defined, and specificity was lower when test negativity thresholds were more stringent; these definitions require standardization. MRI is more accurate than mammography; however, studies comparing MRI and ultrasound are required.

Marinovich *et al. BMC Cancer* (2015) 15:662
DOI 10.1186/s12885-015-1664-4

BMC Cancer

RESEARCH ARTICLE Open Access

Agreement between MRI and pathologic breast tumor size after neoadjuvant chemotherapy, and comparison with alternative tests: individual patient data meta-analysis

Michael L. Marinovich[1*], Petra Macaskill[1], Les Irwig[1], Francesco Sardanelli[2], Eleftherios Mamounas[3], Gunter von Minckwitz[4], Valentina Guarneri[5], Savannah C. Partridge[6], Frances C. Wright[7], Jae Hyuck Choi[8], Madhumita Bhattacharyya[9], Laura Martincich[10], Eren Yeh[11], Viviana Londero[12] and Nehmat Houssami[1]

Risposta patologica non completa: accuratezza dell'imaging

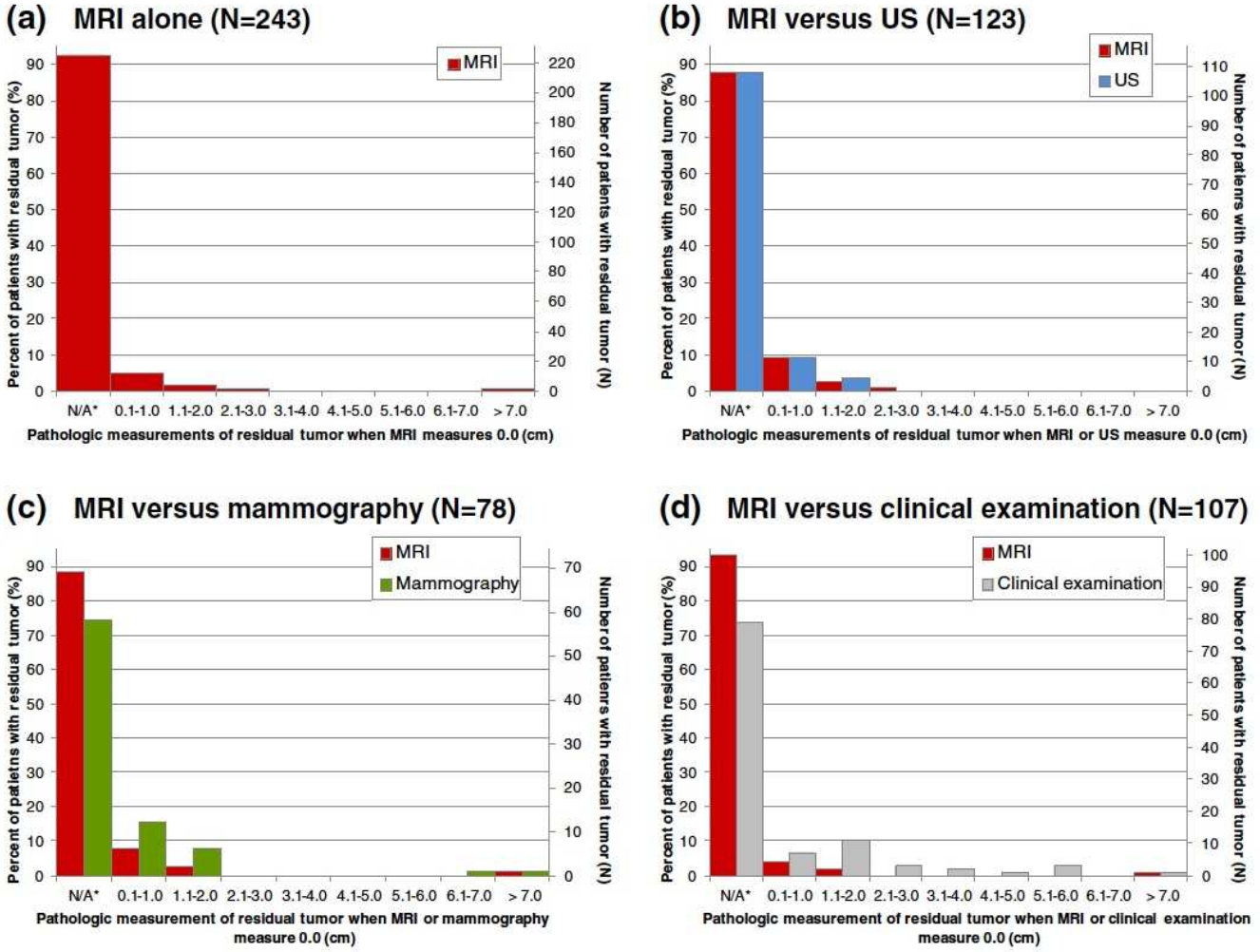


Fig. 1 Pathologic size (cm) of tumor "missed" by MRI for: **a** all patients with residual tumor ($N = 243$); and compared with **b** US ($N = 123$), **c** mammography ($N = 78$), and **d** clinical examination ($N = 107$). MRI = magnetic resonance imaging; N/A = not applicable; US = ultrasound. *Pathology and test(s) measure > 0.0 cm (i.e. residual tumor was not "missed" by MRI or alternative tests).

Risposta patologica completa: accuratezza dell'imaging

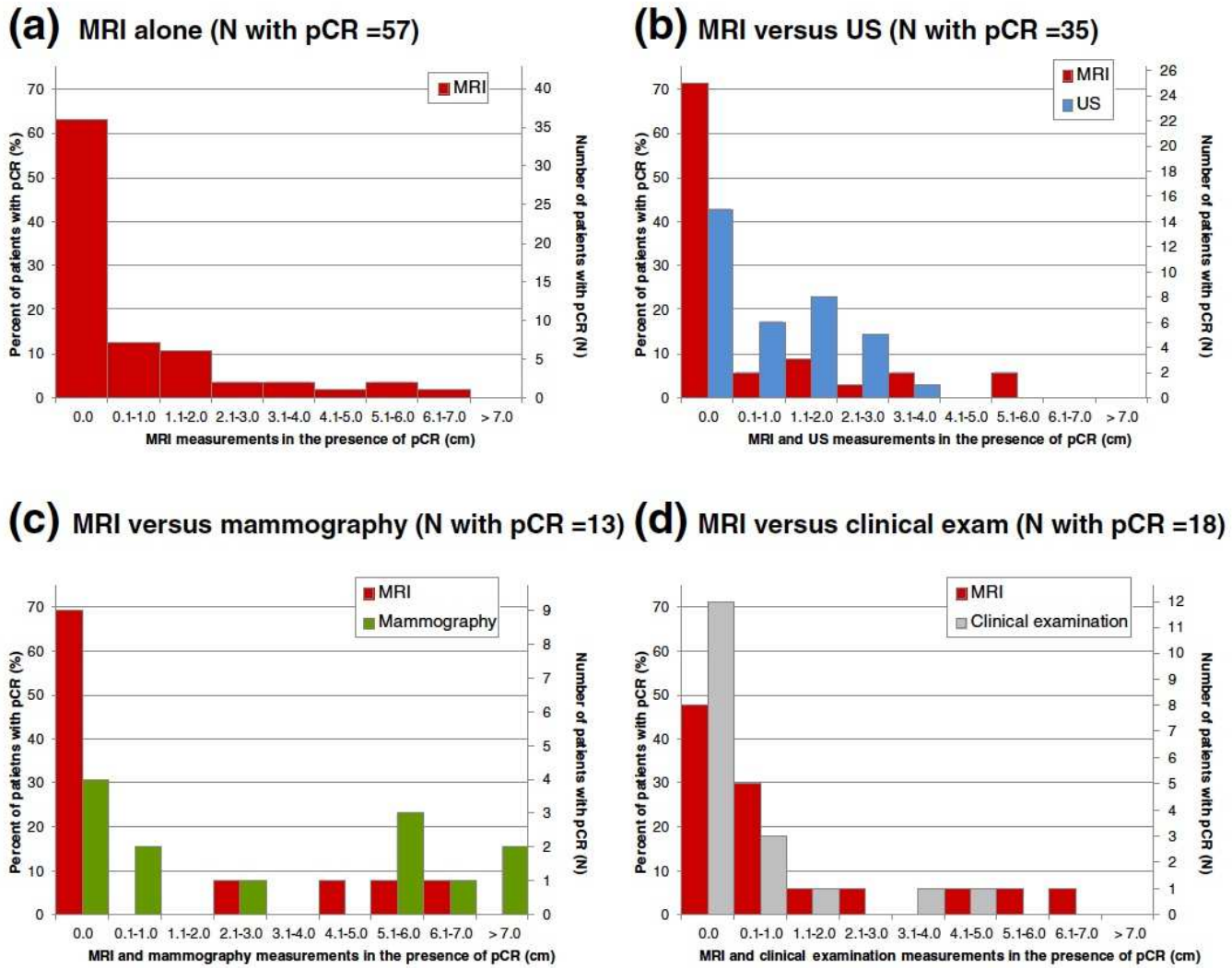


Fig. 2 MRI measurements (cm) for: **a** all patients with pCR ($N = 57$); and compared with measurements by **b** US ($N = 35$), **c** mammography ($N = 13$), and **d** clinical examination ($N = 18$). Measurements of 0.0 cm denote correct identification of pCR. MRI = magnetic resonance imaging; pCR = pathologic complete response; US = ultrasound

Eur Radiol (2016) 26:1474–1484
DOI 10.1007/s00330-015-3948-0

BREAST

Quantitative DCE-MRI for prediction of pathological complete response following neoadjuvant treatment for locally advanced breast cancer: the impact of breast cancer subtypes on the diagnostic accuracy

Stylianos Drisis[1] · Thierry Metens[2] · Michael Ignatiadis[3] · Konstantinos Stathopoulos[1] · Shih-Li Chao[1] · Marc Lemort[1]

Capacità della RM di predire la risposta patologica completa:
Più alta nei tumori Tripli Negativi

Breast Cancer Res Treat. 2017 Jul;164(1):99-106. doi: 10.1007/s10549-017-4254-0. Epub 2017 Apr 21.

MRI predicts pathologic complete response in HER2-positive breast cancer after neoadjuvant chemotherapy.

van Ramshorst MS[1], Loo CE[2], Groen EJ[3], Winter-Warnars GH[2], Wesseling J[3], van Duijnhoven F[4], Peeters MTV[4], Sonke GS[5].

Author information

Abstract

BACKGROUND: Neoadjuvant treatment of HER2-positive breast cancer frequently leads to a pathologic complete response (pCR), which is associated with favourable long-term outcome. Treatment regimens typically consist of 6-9 cycles of trastuzumab-based chemotherapy, although many patients achieve early radiologic complete response (rCR). If rCR accurately predicts pCR, the number of chemotherapy cycles can possibly be reduced.

METHODS: We performed a diagnostic accuracy study to determine the association between rCR and pCR in patients with stage II-III HER2-positive breast cancer treated with neoadjuvant trastuzumab-based chemotherapy at the Netherlands Cancer Institute. RCR was defined as the disappearance of pathologic contrast enhancement in the original tumour region on repeated magnetic resonance imaging (MRI). PCR was defined as the absence of invasive tumour cells in the resected breast specimen (ypT0/is). Diagnostic accuracy was estimated in the overall population and in subgroups based on hormone receptor (HR) status. The prognostic value of rCR for recurrence-free interval was evaluated as an exploratory analysis.

RESULTS: We identified 296 eligible patients with 297 HER2-positive tumours (154 HR-negative and 143 HR-positive) treated with neoadjuvant trastuzumab-based chemotherapy between 2004 and 2016. Overall, the rCR rate was 69% (206/297) and the pCR rate was 61% (181/297). Among 206 patients with rCR, 150 also had pCR (negative predictive value [NPV] = 150/206 = 73%). Among 91 patients without rCR, 60 had residual tumour at pathology (positive predictive value [PPV] = 60/91 = 66%). The NPV was better in HR-negative compared to HR-positive tumours (88 vs. 57%), while the PPV was better in HR-positive tumours (50 vs. 78%). Achieving rCR was associated with a 5-year recurrence-free interval of 88% compared to 68% without rCR (hazard ratio 0.34, 95% confidence interval 0.17-0.65, P = 0.001).

CONCLUSION: Achieving rCR corresponds well with pCR in HER2-positive breast cancer, particularly in the HR-negative subgroup. RCR is also associated with improved long-term outcome.

KEYWORDS: HER2-positive breast cancer; Magnetic resonance imaging; Neoadjuvant therapy; Response monitoring

Eur Radiol (2013) 23:2420–2431
DOI 10.1007/s00330-013-2850-x

BREAST

Diffusion-weighted MRI in pretreatment prediction of response to neoadjuvant chemotherapy in patients with breast cancer

Raphael Richard · Isabelle Thomassin · Marion Chapellier · Aurélie Scemama · Patricia de Cremoux · Mariana Varna · Sylvie Giacchetti · Marc Espié · Eric de Kerviler · Cedric de Bazelaire

Nei tumori tripli negativi un valore più elevato di ADC pretrattamento correla con una peggiore risposta alla NACT

Eur Radiol (2016) 26:1590–1596
DOI 10.1007/s00330-015-4011-x

BREAST

Background parenchymal enhancement in breast MRI before and after neoadjuvant chemotherapy: correlation with tumour response

H. Preibsch[1] · L. Wanner[1] · S. D. Bahrs[1] · B. M. Wietek[1] · K. C. Siegmann-Luz[2] · E. Oberlecher[3] · M. Hahn[3] · A. Staebler[4] · K. Nikolaou[1] · B. Wiesinger[1]

La riduzione del BPE correla con la risposta alla NACT e può essere un indice predittivo di risposta a metà trattamento

J Am Coll Surg. 2017 Sep 14. pii: S1072-7515(17)31933-6. doi: 10.1016/j.jamcollsurg.2017.08.027. [Epub ahead of print]

MRI and Prediction of Pathologic Complete Response in the Breast and Axilla after Neoadjuvant Chemotherapy for Breast Cancer: MRI and Pathologic Complete Response.

Weber JJ[1], Jochelson MS[2], Eaton A[3], Zabor EC[3], Barrio AV[1], Gemignani ML[1], Pilewskie M[1], Van Zee KJ[1], Morrow M[1], El-Tamer M[4].

Author information

Abstract

BACKGROUND: In the setting where determining extent of residual disease is key for surgical planning after neoadjuvant chemotherapy (NAC), herein we evaluate reliability of MRI in predicting pathologic complete response (pCR) of the breast primary and axillary nodes following NAC.

STUDY DESIGN: Patients who had MRI before and after NAC between 06/2014-08/2015 were identified in a prospective database following IRB approval. Post NAC-MRI of the breast and axillary nodes was correlated with residual disease on final pathology. PCR was defined as absence of invasive and in situ disease.

RESULTS: We analyzed 129 breast cancers. Median patient age was 50.8 years (range 27.2-80.6). Tumors were HER2 amplified in 52/129 (40%), estrogen receptor-positive/HER2-negative in 46/129 (36%) and triple negative in 31/129 (24%), with respective pCR rates of 50%, 11% and 29%. Median tumor size pre- and post-NAC MRI were 4.1cm and 1.45cm, respectively. MRI had a positive predictive value of 63.4% (26/41) and negative predictive value of 84.1% (74/88) for in-breast pCR. Axillary nodes were abnormal on pre-NAC MRI in 97 cases; 65 had biopsy-confirmed metastases. The nodes normalized on post-NAC MRI in 33/65 (51%); axillary pCR was present in 22/33 (67%). In 32 patients with proven nodal metastases and abnormal nodes on post-NAC MRI, 11 achieved axillary pCR. In 32 patients with normal nodes on pre- and post-NAC MRI, 6 (19%) had metastasis on final pathology.

CONCLUSIONS: Radiologic complete response by MRI does not predict pCR with adequate accuracy to replace pathologic evaluation of the breast tumor and axillary nodes.

Br J Radiol. 2017 Aug;90(1077):20170269. doi: 10.1259/bjr.20170269. Epub 2017 Jul 14.

A computer-aided diagnosis (CAD) scheme for pretreatment prediction of pathological response to neoadjuvant therapy using dynamic contrast-enhanced MRI texture features.

Giannini V[1,2], Mazzetti S[1,2], Marmo A[2], Montemurro F[3], Regge D[1,2], Martincich L[2].

Author information

Abstract

OBJECTIVE: To assess whether a computer-aided, diagnosis (CAD) system can predict pathological Complete Response (pCR) to neoadjuvant chemotherapy (NAC) prior to treatment using texture features.

METHODS: Response to treatment of 44 patients was defined according to the histopatology of resected tumour and extracted axillary nodes in two ways: (a) pCR+ (Smith's Grade = 5) vs pCR- (Smith's Grade < 5); (b) pCRN+ (pCR+ and absence of residual lymph node metastases) vs pCRN - . A CAD system was developed to: (i) segment the breasts; (ii) register the DCE-MRI sequence; (iii) detect the lesion and (iv) extract 27 3D texture features. The role of individual texture features, multiparametric models and Bayesian classifiers in predicting patients' response to NAC were evaluated.

RESULTS: A cross-validated Bayesian classifier fed with 6 features was able to predict pCR with a specificity of 72% and a sensitivity of 67%. Conversely, 2 features were used by the Bayesian classifier to predict pCRN, obtaining a sensitivity of 69% and a specificity of 61%.

CONCLUSION: A CAD scheme, that extracts texture features from an automatically segmented 3D mask of the tumour, could predict pathological response to NAC. Additional research should be performed to validate these promising results on a larger cohort of patients and using different classification strategies. Advances in knowledge: This is the first study assessing the role of an automatic CAD system in predicting the pathological response to NAC before treatment. Fully automatic methods represent the backbone of standardized analysis and may help in timely managing patients candidate to NAC.

PMID: 28707546 DOI: 10.1259/bjr.20170269

Grazie per l'Attenzione!

vmarra@cittadellasalute.to.it