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03) Matching of Digital MR Mammograms Is Feasible in a Clinical Setting and Is Not Dependent upon Lesion Size

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PURPOSE

Matching of Digital- with MR-Mammograms (MG and MRM) would allow combining these complementary examinations into one single diagnostic study. This would potentially increase diagnostic accuracy of breast imaging and enhance clinical workflow. We designed this investigation to correlate key clinical parameters with precision of matching MG and MRM.

METHOD AND MATERIALS

For imaging acquisition standardized, up to date imaging protocols were applied. Inclusion criteria: MG and MRM showing clearly visible lesions in both exams. Exclusion criteria: Breast intervention/therapy between MG and MRM. Dedicated in-house developed semi-automatic registration software performed matching of MRM to MG exams. To validate precision of matching, the geometric centers in MG vs. the matched MRM were quantified (ΔGC [mm]). Key clinical parameters analyzed for possible influence on ΔGC were: “Size”, (quality of) “Positioning”, “Position” (of the lesion within parenchyma), “Deformation” and “Nipple Position” (of the ipsilateral breast”). Univariate (Anova, t-test, correlation coefficient) and multivariate analysis (Multiple-linear-regression-analysis with backward feature selection: LRA) of ΔGC vs. all clinical parameters was performed for statistical validation.

RESULTS

52 consecutive patients were included. Matching could be successfully performed in all cases. Overall ΔGC was not dependent on “Deformation” (P>0,05; 18,4mm). Univariate analysis identified “Position” as the only signficant predictor for ΔGC (remaining factors P: n.s.). With adjusted R2 of 0.157, (quality of) “Positioning” and “Position” (of the lesion within parenchyma) remained as the only independent predictors in LRA. ΔGC values predicted by the model were significantly (P=0.001) correlated with ΔGC (0.448).

CONCLUSION

In this initial study of matching MG/MRM in a clinical setting, acceptable precision could be identified. In regards to precision of matching, key clinical parameters (including tumor size) played a minor role. This underlines the robustness of the proposed method and the potential to analyze in particular discrete pathology which is often found in early and non invasive cancers.

CLINICAL RELEVANCE/APPLICATION

Matching of conventional- with MR-Mammograms could increase accuracy of breast imaging and enhance clinical workflow. According to our results it is feasible in a clinical setting.

FIGURE (OPTIONAL)

Uploaded Image

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Disclosures:

Nothing to disclose:	Matthias Dietzel
Nothing to disclose:	Pascal Baltzer
Nothing to disclose:	Torsten Hopp
Nothing to disclose:	Nicole Ruiter
Nothing to disclose:	Hartmut Burmeister
Nothing to disclose:	Ulf Teichgraeber
Researcher, Siemens AG Researcher, Bayer AG Researcher, General Electric Company Researcher, Suros Surgical Systems, Inc Researcher, C. R. Bard, Inc Researcher, Boston Scientific Corporation Researcher, Galil Medical Ltd Researcher, Koninklijke Philips Electronics NV Researcher, Confirma, Inc Researcher, CAD Sciences LLC Researcher, Carl Zeiss Stiftung	Werner Kaiser

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