ASSOCIATION BETWEEN PARENCHYMAL ENHANCEMENT AND OUTCOME OF PATIENTS WITH BREAST CANCER

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Abstract

Parenchymal enhancement on DCE-MRI may affect outcome of patients with breast cancer. The aim of this study was to determine if contrast enhancement in healthy contralateral parenchyma is associated with outcome of patients with ipsilateral breast cancer.

The contralateral parenchyma of 524 patients was automatically segmented, in which the late enhancement was calculated.

Breast cancer subtype, parenchymal enhancement, and age at diagnosis were significantly associated with overall survival.

Material & methods

- 524 consecutive patients with unilateral breast cancer
- MARGINS: Multimodality analysis and radiological guidance in breast-conserving therapy (2000–2008) trial
- Early-stage pathology proven invasive breast cancer
- Breast cancer subtype: 393 ER+/HER2-, 64 HER2+, 67 TN
- Parenchymal segmentation
- Enhancement calculation
- Kaplan Meier survival analysis

Parenchymal enhancement on MRI

Dynamic contrast-enhancent MRI (DCE-MRI)

- Pre-contrast T_1-weighted time series ($S(t_0)$)
- After injection contrast agent: four time series at 90 seconds interval ($S(t_1)$,..., $S(t_4)$)

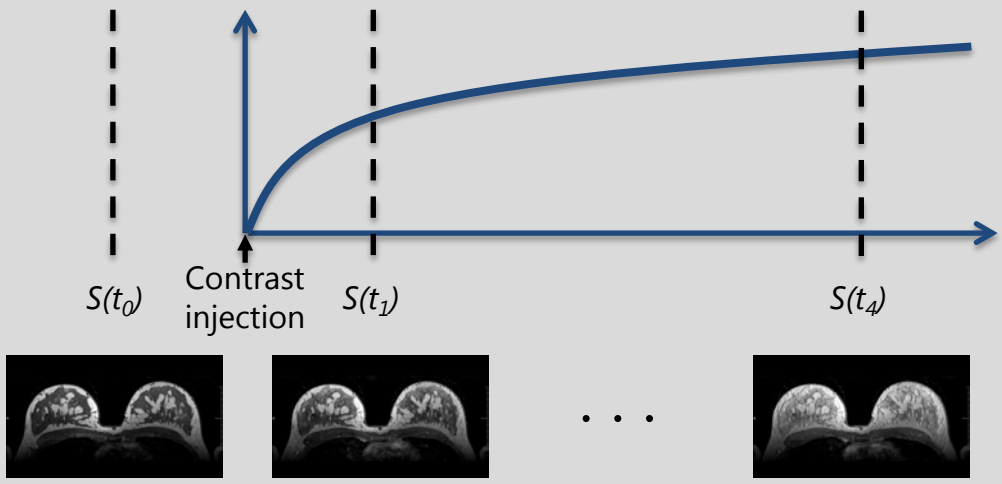
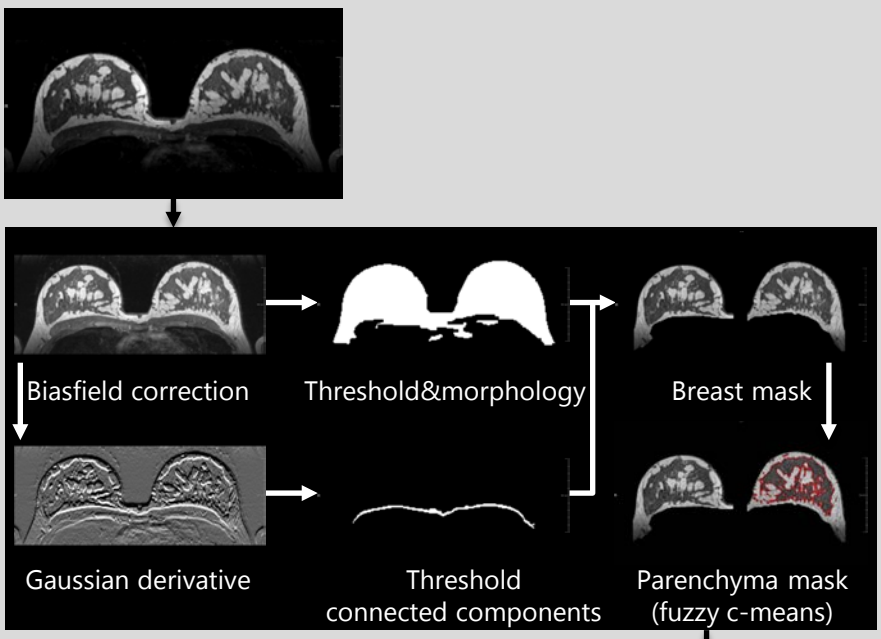


Image Processing



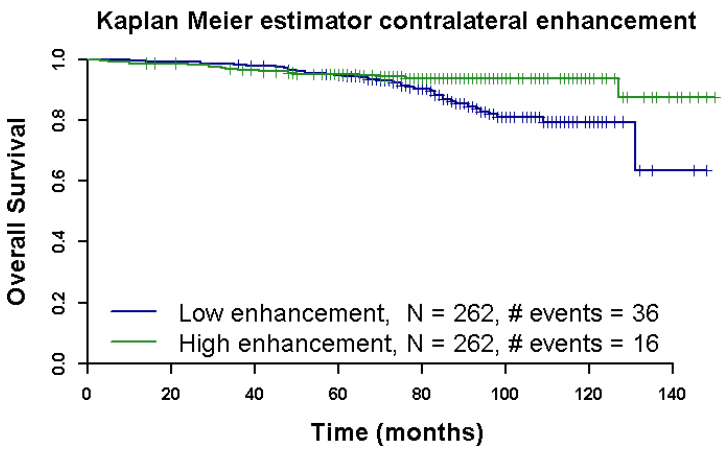
Parenchymal enhancement

$$\frac{S(t_4) - S(t_1)}{S(t_1)}$$

Feature: mean of top 10%

Results

Properties significantly associated with overall survival:
Mean top 10% contralateral parenchymal enhancement ($p=0.003$), age at diagnosis ($p=0.013$), and breast cancer subtype ($p=0.016$)



Conclusion

Patients with less prominent enhancement in the contralateral parenchyma at MRI may have lower overall survival.

Acknowledgments

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