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QIN Breast DCE-MRI

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Summary

This collection of breast dynamic contrast-enhanced (DCE) MRI data contains images from a longitudinal study to assess breast cancer response to neoadjuvant chemotherapy. Images were acquired at four time points: prior to the start of treatment (Visit 1, V1), after the first cycle of treatment (Visit 2, V2), at midpoint of treatment course (Visit 3, V3), and after completion of treatment (prior to surgery) (Visit 4, V4). The value of this collection is to provide clinical imaging data for the development and validation of quantitative imaging methods for assessment of breast cancer response to treatment. Data is provided by Oregon Health & Science University, PI Dr. Wei Huang.

The MRI data consist of DCE-MRI images, which were acquired using a Siemens 3T TIM Trio system with the body coil and a four-channel bilateral phased-array breast coil as the transmitter and receiver, respectively. Following pilot scans and pre-contrast T_2-weighted MRI with fat-saturation and T_1-weighted MRI without fat-saturation, axial bilateral DCE-MRI images with fat-saturation and full breast coverage were acquired with a 3D gradient echo-based TWIST (Time-resolved angiography WIth Stochastic Trajectories) sequence, which employs the strategy of k-space undersampling during acquisition and data sharing during reconstruction. DCE-MRI acquisition parameters included 10^o flip angle, 2.9/6. 2 ms TE/TR, a parallel imaging acceleration factor of two, 30-34 cm FOV, 320x320 in-plane matrix size, and 1.4 mm slice thickness. The total acquisition time was ~10 minutes for 32-34 image volume sets of 112-120 slices each with 18-20 s temporal resolution. The contrast agent Gd(HP-DO3A) [ProHance] IV injection (0.1 mmol/kg at 2 mL/s) by a programmable power injector was timed to commence after acquisition of two baseline image volumes, followed by a 20-mL saline flush.

A total of 20 data sets from this collection have been used for a multi-QIN center challenge, in which each participating site performed pharmacokinetic analysis of the breast DCE-MRI data using software tools/algorithms available to them. The shared data sets are from the V1 and V2 studies of 10 patients (BreastChemo 1, 5, 6, 8, 10, 12, 13, 14, 15, and 16) – 3 pathologic complete responders (pCRs) and 7 non-pCRs. The goal of the challenge was to evaluate variations in DCE-MRI assessment of breast cancer response to neoadjuvant chemotherapy caused by differences in software tools/algorithms only.

About the NCI QIN

The mission of the QIN is to improve the role of quantitative imaging for clinical decision making in oncology by developing and validating data acquisition, analysis methods, and tools to tailor treatment for individual patients and predict or monitor the response to drug or radiation therapy. More information is available on the Quantitative Imaging Network Collections page. Interested investigators can apply to the QIN at: Quantitative Imaging for Evaluation of Responses to Cancer Therapies (U01) PAR-11-150.

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Data Access

Click the **Download** button to save a ".tcia" manifest file to your computer, which you must open with the NBIA Data Retriever. Click the **Search** button to open our Data Portal, where you can browse the data collection and/or download a subset of its contents.

Data Type	Download all or Query/Filter
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