QIN-Breast

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Summary

This collection contains longitudinal PET/CT and quantitative MR images collected for the purpose of studying treatment assessment in breast cancer in the neoadjuvant setting. Images were acquired at three time points: prior to the start of treatment (t1), after the first cycle of treatment (t2), and either after the second cycle of treatment or at the completion of all treatments (prior to surgery) (t3). The PET/CT images were acquired with a support device built in-house to allow the patient to be in the prone position to facilitate registration with the MRI data. The value of this collection is to provide clinical imaging data for the development and evaluation of quantitative imaging methods for treatment assessment early in the course of therapy for breast cancer. Data is provided by Vanderbilt University, PI Dr. Thomas E. Yankeelov.PET/CT data were acquired with a GE Discovery STE scanner (GE Healthcare, Waukesha, WI, USA). A low-mAs CT scan was acquired for attenuation correction of the emission data. The acquisition parameters for the transmission CT scan were the following: the tube current was 80 mAs for a 70-kg patient and scaled accordingly for all patients, the tube voltage was 120 KVp, and the pitch was 1.675/1. The activity of FDG administered was approximately 370 MBq (10 mCi) for a 70-kg patient and scaled according to weight. FDG was administered intravenously via an antecubital vein contra-lateral to the affected breast. After 60 min, emission data was collected in 3D mode for 2 min per bed position. The emission scan was first collected in the prone position over the breast only, and then in the supine position from the skull to mid-femurs. Standard-of-care supine images and research prone images were acquired at times t1 and t3, while only the prone images were acquired at t2.

The MRI data consist of diffusion-weighted images (DWIs), dynamic contrast-enhanced (DCE) images, and multi-flip data for T1-mapping. The MRIs were obtained using a dedicated 16-channel bilateral breast coil at 3.0T (Philips Achieva with the MammoTrak table). DWIs were acquired with a single-shot spin echo (SE) echo planar imaging (EPI) sequence in three orthogonal diffusion encoding directions (x, y, and z). For 14 patients, b = 0 and 500 s/mm2, TR/TE = 2500 ms /45 ms = 21.4 ms, = 10.3 ms and 10 signal acquisitions were acquired. For 19 patients, b = 0 and 600 s/mm2, TR/TE = “shortest” (range = 1800 - 3083 ms/43 - 60 ms) = 20.7 - 29 ms, = 11.4 - 21 ms and 10 signal acquisitions were acquired. For four patients, b = 50 and 600 s/mm2 for two patients), TR/TE = “shortest” (range = 1840 - 3593 ms/43 - 60 ms) = 20.6 - 29 ms, = 11.5 - 21 ms and 10 signal acquisitions were acquired. Prior to the DCE-MRI acquisition, data for constructing a T1 map were acquired with an RF-spoiled 3D gradient echo multi-flip angle approach with ten flip angles from 2 to 20 degrees in 2o increments. For both the T1 map and DCE scans, TR = 7.9 ms, TE = 4.6 ms, and the acquisition matrix was 192x192x20 (full-breast) over a sagittal square field of view (22 cm2) with slice thickness of 5 mm. For the DCE study, each 20-slice set was collected in 16 seconds at 25 time points for just under seven minutes of dynamic scanning. A catheter placed within an antecubital vein delivered 0.1 mmol/kg (9 – 15 mL, depending on patient weight) of gadopentetate dimeglumine, Gd-DTPA, (Magnevist, Wayne, NJ) at 2 mL/sec (followed by a saline flush) via a power injector (Medrad, Warrendale, PA) after the acquisition of the first three dynamic scans (baseline).

QIN-Breast-02 Multi-center Study

An extension of this QIN-BREAST collection is available via the QIN-BREAST-02 collection. It contains updated scan protocols and data collected at both Vanderbilt University Medical Center and the University of Chicago to demonstrate similar results at multiple sites (both using Philips 3T MR scanners).

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

Data Access

Data Type	Download all or Query/Filter	License
Images (DICOM, 11.286 GB)	*Download* *Search* (Download requires the NBIA Data Retriever)	CC BY 3.0
QIN-Breast Treatment Response (XLS, 16 kB)	*Download*	CC BY 3.0

Click the Versions tab for more info about data releases.

Additional Resources for this Dataset

The NCI Cancer Research Data Commons (CRDC) provides access to additional data and a cloud-based data science infrastructure that connects data sets with analytics tools to allow users to share, integrate, analyze, and visualize cancer research data.

- Imaging Data Commons (IDC) (Imaging Data)

Detailed Description

Detailed Description

	Radiology Image Statistics
Modalities	MR, PT, CT
Number of Patients	68
Number of Studies	216
Number of Series	536
Number of Images	102,451
Image Size (GB)	11.4

Metadata

Treatment Response information: QIN-Breast_TreatmentResponse(2014-12-16).xlsx

Citations & Data Usage Policy

Citations & Data Usage Policy

Users must abide by the TCIA Data Usage Policy and Restrictions. Attribution should include references to the following citations:

Data Citation

Li, X., Abramson, R. G., Arlinghaus, L. R., Chakravarthy, A. B., Abramson, V. G., Sanders, M., & Yankeelov, T. E. (2016). **Data From QIN-Breast (Version 2) [Data set].** The Cancer Imaging Archive. https://doi.org/10.7937/K9/TCIA.2016.21JUEBH0

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Publication citation:

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TCIA Citation

Clark K, Vendt B, Smith K, Freymann J, Kirby J, Koppel P, Moore S, Phillips S, Maffitt D, Pringle M, Tarbox L, Prior F. **The Cancer Imaging Archive (TCIA): Maintaining and Operating a Public Information Repository**, Journal of Digital Imaging, Volume 26, Number 6, December, 2013, pp 1045-1057. DOI: 10.1007/s10278-013-9622-7

Other Publications Using This Data

TCIA maintains a list of publications which leverage TCIA data. If you have a manuscript you'd like to add please contact TCIA's Helpdesk.

Versions

Version 2 (Current): Updated 2020/01/10

Lifted "Restricted access" embargo. No changes to files were required.

Version 1: Updated 2015/09/04

Data Type	Download all or Query/Filter
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QIN-Breast Treatment Response (XLS)	*Download*

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