FULL TEXT LINKS

WILEY Full Text Article

Longitudinal fan-beam computed tomography dataset for head-and-neck squamous cell carcinoma patients

Tatiana Bejarano [1], Mariluz De Ornelas-Couto [1], Ivaylo B Mihaylov [1]

Affiliations
PMID: 30806479   PMCID: PMC6510641   DOI: 10.1002/mp.13460

Free PMC article

Abstract

Purpose: To describe in detail a dataset consisting of longitudinal fan-beam computed tomography (CT) imaging to visualize anatomical changes in head-and-neck squamous cell carcinoma (HNSCC) patients throughout radiotherapy (RT) treatment course.

Acquisition and validation methods: This dataset consists of CT images from 31 HNSCC patients who underwent volumetric modulated arc therapy (VMAT). Patients had three CT scans acquired throughout the duration of the radiation treatment course. Pretreatment planning CT scans with a median of 13 days before treatment (range: 2-27), mid-treatment CT at 22 days after start of treatment (range: 13-38), and post-treatment CT 65 days after start of treatment (range: 35-192). Patients received RT treatment to a total dose of 58-70 Gy, using daily 2.0-2.20 Gy, fractions for 30-35 fractions. The fan-beam CT images were acquired using a Siemens 16-slice CT scanner head protocol with 120 kV and current of 400 mAs. A helical scan with 1 rotation per second was used with a slice thickness of 2 mm and table increment of 1.2 mm. In addition to the imaging data, contours of anatomical structures for RT, demographic, and outcome measurements are provided.

Data format and usage notes: The dataset with DICOM files including images, RTSTRUCT files, and RTDOSE files can be found and publicly accessed in the Cancer Imaging Archive (TCIA, http://www.cancerimagingarchive.net/) as collection Head-and-neck squamous cell carcinoma patients with CT taken during pretreatment, mid-treatment, and post-treatment (HNSCC-3DCT-RT).

Discussion: This is the first dataset to date in TCIA which provides a collection of multiple CT imaging studies (pretreatment, mid-treatment, and post-treatment) throughout the treatment course. The dataset can serve a wide array of research projects including (but not limited to): quantitative imaging assessment, investigation on anatomical changes with treatment progress, dosimetry of target volumes and/or normal structures due to anatomical changes occurring during treatment, investigation of RT toxicity, and concurrent chemotherapy and RT effects on head-and-neck patients.

Keywords: CT; fan-beam computed tomography; head-and-neck squamous cell carcinoma.
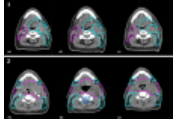
PubMed Disclaimer

Figures

Figure 1 Pretreatment (a), Mid-treatment (b), Post-treatment...

Figure 2 Organs at risk contours for...

Related information

LinkOut – more resources

Full Text Sources

Medical