

Longitudinal Abdominal Compression Device

Summary

Invented by Senior Radiation Physicists, the Longitudinal Abdominal Compression Device enhances the delivery of radiation therapy for patients with lung, liver, pancreas, or other abdominal lesions. The low profile design improves upon current abdominal compression devices and permits more unrestricted beam angles and reduces interference with linac configurations.

Key Investigator

Andrew Morrow, MS

Field

Radiation Oncology

Technology

Longitudinal Abdominal Compression for Radiotherapy

Key Features

- Permits more treatment beam geometries
- Low profile minimizes physical interference with linac

Stage of Development

Preclinical, Prototype

Status

Available for licensing

Patent Status

Provisional

Contact

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Market

Lung cancer is the most common cancer in the world with more deaths than any other cancer. About 13% of all diagnosed cancers are of the lung.¹ Approximately 70% of patients with lung cancer receive treatment using stereotactic body radiotherapy (SBRT) to deliver a targeted radiation dose to a tumor. It is reported that 55.6% of physicians use abdominal compression to manage respiratory-induced motion when treating lung cancers with SBRT.²

Abdominal compression techniques reduce respiratory movement for treatment of lesions that shift with respiratory motion. By placing pressure on the diaphragm of patients receiving SBRT, the compression allows a more precise delivery of radiation therapy to patients with tumors, such as in the lung.

Current compression devices on the market are designed to arch over and around the patient's abdomen. These transverse arches can be bulky and wide with a potential to limit treatment beam placement and interfere with the linear accelerator gantry or beam for some gantry and patient couch configurations, especially when treating the liver (the third most common SBRT treated disease site²), pancreas, or other abdominal site.

Other belt like compression devices may have a smaller profile but with limited compression capabilities.

Technology

This abdominal compression device is designed to free the body of bulky transverse equipment and is expected to provide more degrees of freedom in selecting radiation therapy beams when compared to the conventional transverse arch compression devices.

Indexable adjustments in the design accommodate various sizes of patients' abdomens while providing reproducible compression levels.

A device prototype has been built and is being tested for proof of concept.

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>

2. Pan, Hubert et al. "A Survey of Stereotactic Body Radiation Therapy Use in the United States." *Cancer* 117.19 (2011): 4566-4572. *PMC*.