Air Trapping and Emphysema Changes During Respiration in Chronic Obstructive Pulmonary Disease.

Published: 15-01-2008 Last updated: 09-05-2024

1. To develop a method that lets us derive measures of air trapping and emphysema from static CT that are independent of inspiration level. In order to achieve this objective we need to:2. study the influence of inspirational level on the extent of...

Ethical review	Not approved
Status	Will not start
Health condition type	Congenital respiratory tract disorders
Study type	Observational non invasive

Summary

ID

NL-OMON30894

Source ToetsingOnline

Brief title AERO study

Condition

• Congenital respiratory tract disorders

Synonym chronic bronchitis and emphysema, COPD

Research involving Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Utrecht **Source(s) of monetary or material Support:** Ministerie van OC&W

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Intervention

Keyword: 4D CT, air trapping, COPD, emphysema

Outcome measures

Primary outcome

Quantification of emphysema and air trapping on CT on different inspirational

levels.

Secondary outcome

not applicable

Study description

Background summary

COPD is defined as a disease state characterized by the presence of airflow obstruction and / or emphysema. Both are conventionally guantified using pulmonary function tests (PFT). However, the ability of PFT to distinguish airflow obstruction from emphysema is limited. Moreover, PFT is an integral measure which generates no information about which part of the lungs is most affected. With the use of CT it is possible to make a morphological quantification of COPD. Emphysema can be measured directly, airflow obstruction can be quantified by the amount of air trapping. CT therefore has the potential to identify COPD subtypes and demonstrate which parts of the lungs are affected by these subtypes. However, CT measurements vary during the respiratory cycle. For that reason scans are made in suspended maximum inspiration or expiration, but in practice inspirational levels are not totally constant even then. Little is known about the exact changes in emphysema and air trapping on different levels of inspiration. This can be studied using 4D CT. By performing additional static scans the dynamic information can be transferred to static setting (as in standard CT) and a suitable correction for variations in inspiration can be developed.

Study objective

1. To develop a method that lets us derive measures of air trapping and emphysema from static CT that are independent of inspiration level.

In order to achieve this objective we need to:

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2. study the influence of inspirational level on the extent of air trapping and emphysema measurements using 4D CT data.

3. relate measurements of air trapping and emphysema score on dynamic (4D) CT to static (3D) CT.

Study design

Patients participating in this study will receive a clinical 4D CT scan from the radiology department. 4D CT is performed while the table is moving very slowly, while the patient is breathing normally. Respiration is recorded and synchronized with the CT data. Combined, a total chest CT for every specific point in time during respiration can be reconstructed. This 4D CT will be used for the planning of the radiation. We will use the 4D data to assess emphysema and air trapping measurements on different inspirational levels. Next, 3 static low dose CTs (inspiration, expiration, mid-respiration) are added to ensure that the dynamic data can be reliable transferred to static CT.

Study burden and risks

The CT scans performed for the purpose of this study have a total dose of < 6 mGy. Participating will add 10 minutes to the clinical 4D CT scan time.

Contacts

Public

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Trial sites

Listed location countries

Netherlands

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Eligibility criteria

Age Adults (18-64 years) Elderly (65 years and older)

Inclusion criteria

All lung cancer patients receiving radiotherapy, with curative intent, will be invited to participate.

Exclusion criteria

prior inclusion in this study

Study design

Design

Study type: Observational non invasive		
Masking:	Open (masking not used)	
Control:	Uncontrolled	
Primary purpose:	Diagnostic	

Recruitment

NL	
Recruitment status:	Will not start
Enrollment:	40
Туре:	Anticipated

Ethics review

Not approved	
Date:	15-01-2008
Application type:	First submission

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Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register CCMO **ID** NL19406.041.07