RAPID PROTOTYPING PRODUCED PATIENT MASK FOR PRECISE POSITIONING IN RADIOTHERAPY

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HINTERGRUND

Radiotherapy is a well-established method to treat certain tumor types in particular brain tumors. In order to direct the beam at the correct spot of the lesion it is necessary during treatment to keep the head of the patient positioned exactly at the same position. For fixation a “mask” is used, which is connected to the plate where the patient is located on. To manufacture the mask the patient has to be involved in a procedure for the plaster cast, which is uncomfortable and painful.

The novel technology describes a noninvasive procedure, where the patient mask is produced by rapid prototyping based on data derived from previous digital imaging data from computer tomography (CT) or magnetic resonance imaging (MRI), positron emission tomography (PET) as well as optical, ultrasound (US) or laser-based scanners.

First the reproduction of individual head surface from CT/MRI images is obtained. Subsequently the reprint of anatomical structures has to be established. Here it is important to eliminate all possible artifacts in order to create a proper surface contour of the head.

The imaging data is transmitted to a rapid prototyping apparatus as readable data. With this readable data the rapid prototyping apparatus establishes a surface model, which can be used as a patient fixation device (mask).

LÖSUNG

- Mask for patient fixation in radiotherapy of brain tumors
- Software reprinting automated contour of head from CT/MRI
- Manufacturing of masks by rapid prototyping

Deutsches Krebsforschungszentrum DKFZ
Dr. Frieder Kern
+49-6221-42-2952
f.kern@dkfz.de
www.dkfz.de

ENTWICKLUNGSSTAND

Prototyp

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Schematic scheme of work flow of mask manufacturing.

**VORTEILE**

- Less manpower required due to automatic software producing the mask
- Mask can be produced in advance to the radiotherapy treatment
- No direct involvement of the patient required

**ANWENDUNGSBEREICHE**

Software can be used for automated manufacturing of fixation device of patients head for radiotherapy of brain tumours.