Stereotactic Computer Tomography with a Modified Riechert-Mundinger Device as the Basis for Integrated Stereotactic Neuroradiological Investigations*

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With 5 Figures

Summary

For stereotactic biopsy, intracavitary and interstitial irradiation of intracranial tumours, stereotactic CT investigations are of utmost importance. Target-points within a tumour as well as the tumour-outlines have to be transferred precisely from transverse and longitudinal CT sections to stereotactic X-ray images. For this purpose, the stereotactic apparatus of Riechert and Mundinger has been equipped with a fixation system of carbon fibre and a measuring phantoma of plexiglass with embedded steel wires allowing stereotactic CT scanning without artefacts. The stereotactic coordinates (x, y, z) of any target point can be taken directly from transverse CT images with high accuracy. The tumour outlines can be transferred to the stereotactic coordinate system from longitudinal CT reconstructions using special computer programmes. Precise transfer is possible if the CT investigation is performed stereotactically.

Introduction

With increasing possibilities in the treatment of surgically in accessible intracranial tumours by radiological and chemotherapeutical methods, there is increasing need for histological assessment of the lesions by stereotactic biopsy. For safely performing this procedure as well as for therapeutic stereotactic interventions (e.g. interstitial irradiation) stereotactic CT, i.e. scanning with the stereotactic frame fixed to the patient's skull, is an indispensable prerequisite.

* Dedicated to Prof. Dr. O. Westphal on the occasion of his 70th birthday.
Fig. 1. Upper panel: Base-ring with carbon fibre fixation system, consisting of 2 frontal and 2 occipital fixation units. Each unit is comprised of a metal holder, which can be screwed to the ring at any point. It guides a bar of carbon fibre with an exchangeable carbon fibre pin at the tip. The tips are inserted into the tabula externa of the skull transcutaneously by pressure, exerted by a screw. Lower panel: Different types of fixation units with variously shaped carbon fibre bars for different sizes of skulls