

## **Enhancement of Tumor Coverage by Interstitial Support to the Intracavitary HDR Brachytherapy for Cervical Carcinoma.**

In brachytherapy for cervical carcinoma, generally a Fletcher type applicator is applied. The Gross Tumor Volume (GTV), however, often expands laterally and, in consequence, may not be fully covered by the pear-shaped reference isodose. This study concerns a change of the conventional dosedistribution by combining endocavitary and interstitial irradiation.

To widen the dosedistribution each ovoid was provided with a channel for implant of a needle into the cervix. In order to determine the necessity for needle implant, anatomical data was obtained from pre-treatment MRI. Since April 1994, combined intracavitary and interstitial treatment was indicated in 44 out of 61 patients. Dose-volume histograms were calculated with an without needles respectively and related to the GTVs as identified on the MRI.

The combination with needles and dose optimisation made it possible to achieve a substantial increase of the Covering Index (CI), when compared with endocavitary treatment only. In patients with a relatively small GTV (< 30cc) an increase in CI from 0.87 to 0.94 was found while in patients with a median GTV (70cc) an increase in CI from 0.57 to 0.73 was registered. Tolerance dose of bladder or rectum was not exceeded.

In HDR brachytherapy applied in the treatment of cervical carcinoma, the combined method of endocavitary and interstitial irradiation seems to be a feasible method. An increase of the tumor coverage is achieved in association with a decrease of the total volume treated.