

BTh 08**HIGH DOSE-RATE AFTERLOADING RADIATION THERAPY FOR THE TREATMENT OF BILE DUCT CARCINOMAS.**

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Malignant tumors of the extrahepatic bile ducts are generally advanced, rarely resectable and have a poor prognosis (five year survival rate less than 5%). Some reports have demonstrated that external beam radiation therapy is effective in decreasing the size of unresectable carcinoma and may even be curative in patients having localized lesions. However the low radiation tolerance of surrounding structures often limits the external radiation dose. In this situation the application of radionuclides in the bile duct whether alone or in combination with external beam radiotherapy may be favourable in terms of significant palliation, local control and modest improve of survival. Up to now, for a transpapillary insertion only low- or medium dose-rate sources are practicable because of technical problems. On the other hand the presence of a transhepatic catheter allows the insertion also of high dose-rate sources into the bile duct system.

During the last year we treated 8 patients with advanced carcinomas by means of the high dose-rate 192 Ir - afterloading system. No external beam radiation was applied because of widespread disease. The mean age of the patients was 60 years with a range of 33-79 years. A dose of 20-45 Gy in one to three sessions was delivered to a 1 cm radius. No severe side-effects related to irradiation could be observed. Four out of 8 patients are dead of disease 9,6,9 and 5 months from the date of first treatment. Four are still alive with a medium follow up of 4 months (range 2-7 months). The clinical course demonstrated good responses with decreasing values of alkaline phosphatase and bilirubin as well as widened ductal lumina in nearly all cases.

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BTh 09**CLINICAL RESULTS OF AFTERLOADING SHORT-TERM THERAPY COMPARED WITH RADIUM THERAPY**

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Intracavitary brachytherapy will continue to play an important role in primary radiotherapy of gynecologic tumors. However, afterloading methods with remote control will more and more replace the classical radium therapy. The radiophysical and radiobiological differences between radiotherapy and afterloadingtherapy with remote controll are discussed and a comparison of both methods based on our own clinical results is presented.

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BTh 10**HIGH-DOSE-RATE (HDR) - 192 IR - AFTERLOADING IRRADIATION OF THE PROSTATIC CARCINOMA**

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Up to now in most cases of interstitial radiotherapy of prostatic carcinoma a suprapubic implantation of 125 I-seeds has been made after lymphadenectomy. Disadvantages of this method are the risk of an uneven seed distribution, the unequal emission of the seeds, the possibility of computing the dose distribution not before the application, the risk of loosing seeds and problems with radiation protection.

For this reason we have developed a HDR - afterloading implantation method using 192 Ir-sources in cannulas. These cannulas are inserted from the perineum controlled by a transrectal ultrasound device. The advantages: no radiation exposure of the staff, short application times, possibility of positioning the needles exactly and prospectively and of fractionation, favourable combination with percutaneous radiotherapy.

Extensive investigations of the radiotolerance of the rectum at HDR irradiation and excentric loading have been carried out using rats. HDR needs a stronger fractionation because of a tolerance dose factor of 2 compared to low-dose-rate. The new method has been applied at 15 male dogs. Dose and fractionation varied between 1x10 Gy and 5x15 Gy. The bladder and urethra dose has been measured with TLD rods and ionisation microchambers. Two rectum ulcers have been found at doses of 3x30 Gy and 5x15 Gy.

Up to now we have treated 6 patients with prostatic carcinoma stage A and B in this way: 3 afterloading applications each 7,0 Gy and 30-35 Gy percutaneous radiotherapy. Using lumbar anaesthesia the acute tolerance has been excellent in all patients. The follow-up is 5-15 months. We have not found any bladder or rectum complications.

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BTh 11**INTERSTITIAL RADIOTHERAPIE OF PROSTATE CARCINOMAS WITH 125-IODINE SEEDS**

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The practical and organizational performance of interstitial radiation therapy with 125-iodine-seeds in prostatic cancer is described. Precautions and measurements for radiation protection are emphasized. Evaluation of these measurements show that this therapeutical technique can be performed in complete accordance with the directives for radioprotection. The computer assisted isodose-calculation and the in vivo measurements in the rectum, urethra and bladder confirm the steep decrease of the dose outside the implanted tumor volume. Inflammatory symptoms accompanying the therapy are markedly allayed in comparison with percutaneous radiation therapy, in spite of a higher tumor dose.

From 1978 to 1985 fiftyfour patients were treated. The median follow up is 42 month. 85% of the patients are alive, 76% without evidence of disease and 9% with local or distant failure. 15% of the patients are dead, 7.5 died from their cancer and another 7.5% died from intercurrent disease.

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