202 PUBLICATION

IORT IN PRIMARY RECTAL CANCER: EXPERIMENTAL AND CLINICAL RESULTS

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For IORT we use a flexible flab which is placed into the sacral cavity. The flab contains plastic tubes. A 370 GBq-192-Ir-source is inserted in one tube after the other and stepwise retracted. IORT was experimentally performed in the pelvis of a female dead body. The measured doses were identical with the 3 D-calculated dose distribution in the target volume and region of critical organs (e.g. ureter). In a phase II trial 40 patients with locally advanced primary rectal cancer were treated with pre- or postoperative radiochemotherapy (pre: 2 × 1.1 Gy/day, 40 Gy; post: 1 × 1.8 Gy, 50.4 Gy; Cht: 5 FU, continuous infusion or bolus). Overall survival data suggest a benefit of IORT combined with preop RT. Major side effect is a prolonged wound healing and local infection.

203 PUBLICATION

EXTERNAL IRRADIATION AND INTERSTITIAL LDR BRACHYTHERAPY IN THE TREATMENT OF EARLY BREAST CANCER

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The combined method of conservative surgery, using local tumor excision and axillary node dissection, plus irradiation, has been used in our department since 1983–1994 (190 patients with early breast cancer): 80 (42.1%) patients received boost therapy with Cr-137 implants, 65 (34.2%) had external beam therapy and 45 (23.6%) no boost. To the first group of patients a dose of 45–50 Gy was given to the whole breast by external radiotherapy, and the previous tumor area was boosted by an interstitial implant with Caesium-137 LDR (about 20 Gy in fraction).

External beam irradiation was given to the whole breast 10–14 days later. In this group we found a local recurrence rate of 5.2% (4/80).

The second group of patients had external boost of 14–15 Gy (7 Gy × 2), given by electrons in the energy range of 9–12 Mev. An additional dose of 74–80 Gy in three fractions daily (10 Gy × fraction), was given to these patients in cases of central and media breast cancer. We used a microSelectron-HDR for intraoperative brachytherapy and irradiated the parasternal lymph node chain. The local recurrence rate was 7.6 (5/65). And in a third group of 45 patients the entire breast was irradiated by only 50 Gy without boost. For this group there was a recurrence rate of 13.3% (6/45).

204 PUBLICATION

RADIOTHERAPY IN EARLY STAGES OF CERVICAL CANCER PATIENTS

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From 291 patients with cervical cancer 181 (62.2%) were in the inoperable stage (FIGO st. II-b and more). Operation as primary therapy was possible in 110 cases (37.8%). Early stages of cervical cancer (CIN, Ia) were rare and registered in 22/291 patients (7.36%). Five year survival did not show good results in this group. Even 27.4% patients with early stage showed progression and died. Poor results are based on insufficient preoperative diagnosis, as missing of pathohistologic parameters (depth of tumor invasion and invasion of vascular and lymphatic vessels). Because of that we must frequently use postoperative radiotherapy in early cervical cancer patients in purpose to get better results.

205 PUBLICATION

QUALITY CONTROL IN BRACHYTHERAPY (BT) TREATMENTS FOR HEAD AND NECK NEOPLASMS

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To optimize BT in plastic tube technique for oral carcinomas we use real size CT slices (RSCTS). The day after the implant, the patients are referred to the radiology department with CT hyperdense dummy sources in the plastic tubes. Some RSCTS are performed to study the real relationship between the sources and to know the real distance to the neighborhood structures. After the dosimetric study is made, we know the dose distribution in the area of the implant and the dose in the healthy tissues. Some RSCTS are performed the last day, after treatment is finished. This allows us knowledge of variations in the dose distribution during the treatment time. We report our results.

206 PUBLICATION

A NEW APPROACH OF RADIOTHERAPY OF THE LARYNX CANCER—PRELIMINARY REPORT

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Problems of failed treatments of head and neck cancer require finding new approaches to development of new treatment methods. Larynx cancer takes the leading place among other tumor locations. Accelerated tumor clonogen repopulation during radiotherapy of head and neck cancer may worsen the possibilities of local tumor control. Compensatory proliferation of normal mucosa starts about 2 weeks after starting radiotherapy. Tumor clonogen proliferation is squamous cell carcinoma of head and neck accelerates it about 4 weeks. One of the methods to counteract this is to escalate the dose in a day during treatment in step with compensatory proliferation in oral mucosa and proliferation in tumor. Ten patients (squamous cell carcinoma of larynx $T_{3-4}N_{0-3}M_0$) were treated with ^{60}Co. We propose the following non-standard fractionation schedule planned with a radiobiological basis: 1 week—17 Gy twice daily; 2–3 weeks—1 Gy twice daily; $4\frac{1}{2}$ week—1.7 Gy twice daily. Daytime intervals of 6 h are maintained.

We consider this schedule has also been successful in the treatment of larynx cancer ($T_{3-4}N_{0-3}M_0$). The clinical results and side effects in our material will be reported.

207 PUBLICATION

EXTENSION OF SHEROUSE'S GRATIS™ THREE-DIMENSIONAL TREATMENT PLANNING SYSTEM FOR USE WITH A MULTILEAF COLLIMATOR

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In February 1995, a linear accelerator (Philips SL25) was retrofitted with a Philips multileaf collimator (MLC). MLC reduces workload (decreases the numbers of cerrobend blocks) and increases throughput (avoids tray placements). However, programming the leaf settings is a labor intensive procedure on the Philips MLC, as settings have to be derived manually from simulator films. We use the GRATIS 3D planning system by George W. Sherouse and have written an extension to plan the leaf settings in beam's eye view mode. From a tool implemented in GRATIS' last release, which draws a conformal block around the target with a predefined margin, we developed a feature for automatic or interactive leaf setting. After virtual simulation, a file with the leaf settings is transferred to the MLC computer over a local network. The advantages of this system are efficiency, automatization and elimination of transfer errors. Within the philosophy of GRATIS, we will make our tool freely available to the GRATIS users.

208 PUBLICATION

G2 BLOCK IN IRRADIATED CERVIX TUMORS

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Uterine cervix carcinoma is one of the most common gynaecological malignancies in Portugal, accounting for 19.6% of all tumors in women.

Considerable interpatient differences in radioresponse are observed in this condition, and thus it is important to evaluate the role that tumor radiosensitivity may play in determining treatment efficacy. The demonstration that some tumors are more radiosensitive than others may allow the selection of a subgroup that will need adjuvant therapy.

The objective of this work was to verify the predictive value of DNA content and G2 phase fraction, evaluated by flow cytometry, on the outcome of fractionated radiotherapy.

A significant radiation induced in G2 block was observed after one week of treatment, both in aneuploid and diploid tumors.