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Intraoperative radiation therapy (IORT) and chemotherapy in treatment of urinary bladder cancer

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Purpose: Elucidate the role of (IORT) as bladder boost in definitive treatment of bladder cancer

Methods: 18 patients with muscle invasive bladder cancer (T_2 - T_3) were subjected to combined modality treatment using cisplatin + radiotherapy. The radiation treatment was performed in (2) phases *Phase I* external beam 44 Gray. *Phase II* IORT 8-15 Mev electrons delivering 12-22 Gray, to the exposed primary site at the time of cystostomy.

Results: 12 out of 18 cases attained complete remission (66.7%). Disease free survival & overall survival rates were 44.4% & 61.1% respectively.

Conclusion: (IORT) bladder boost + chemotherapy attained good response in definitive treatment of bladder cancer as an alternative modality of cystectomy

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Preoperative radiotherapy of schistosomal bladder cancer. Prospective randomised study

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Purpose: To elucidate the impact of preoperative radiation therapy on response rate; recurrence & survival of cancer bladder in Egypt.

Methods: 52 patients "21" received preoperative radiotherapy 44 Gray and "31" cases subjected to cystectomy.

Results: Down staging of cases received radiotherapy T_3 more than T_2 (45% versus 40%). Treatment failure was significantly higher in cystectomy alone group if compared with preoperative radiotherapy group (29% versus 4.7%). The recurrence rate was higher in T_3 than T_2 tumors this was statistically significant.

Conclusion: Preoperative radiotherapy significantly improve response & survival in schistosomal bladder cancer

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High-dose-rate brachytherapy after external beam irradiation in palliative treatment of squamous cell carcinoma of the esophagus

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Purpose: After external beam irradiation in patients with inoperable squamous cell carcinoma of the esophagus most patients die because of local recurrence of the tumor. In a retrospective study the value of High-dose rate intraluminal brachytherapy to reduce incidence of local tumor recurrence and improve local-tumor-control was evaluated.

Methods: Between 1983 and 1997, 147 patients with inoperable esophageal cancer were treated with external radiotherapy of 50-60 Gy in fractions of 1.8-2.0 Gy per day. Treatment planning was performed individually in various planes by TPS and OSS. 37 patients received a simultaneous chemotherapy with 5-FU and Mitomycin C. 25 patients followed a intraluminal boost therapy in 2-4 fractions with a single dose of 4-8 Gy two weeks after external radiation.

Results: Overall survival after one year was 28% for the whole group (median 10.5 month). Patients with intraluminal brachytherapy showed significant ($p < 0.05$) improvement in survival versus external irradiation alone (1-year-survival 66% vs. 20%, median survival 16 month vs. 9 month). Local disease free survival after one year was 36% in the combination group vs. 12% in external-beam irradiation group ($p < 0.05$). Local control improved not significantly from 42% in external therapy to 58% in combination group.

Conclusions: Fractionated high-dose-rate brachytherapy performed after external irradiation is a feasible modality in treatment of inoperable esophageal squamous cell carcinoma. We believe it is highly effective to reduce local-tumor-recurrence as well as improve local-tumor-control. Further studies will be needed.

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Dose optimisation of boost irradiation using electron beam in breast carcinoma

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Purpose: The study has been designed to compare the difference between two types of boost treatment planning methods and to obtain optimum dose distribution.

Method: Ten patients (pts) who had surgical clips placed in the tumor bed at the time of tumor excision were evaluated. At first, treatment field and treatment depth of this pts. were defined according to clinical parameters of the pts. before surgery and incision scars. In the first type of treatment planning since the tumor bed depth was can not be determined, CT scan were done and inner surface of the thoracic wall were covered by 85% reference isodose on the central slice. In the second one, it's aimed that all clips which were within 1 cm in 85% reference dose of each slice encompassed in the treatment plan. The changes in field, energy, gantry angle, collimator angle, and field center displacement were evaluated.

Results: It has been shown that in 50% of pts. the energy, in 90% pts. the fields, in 50% of pts. the gantry angles, in 40% of pts. the collimator angles and in 50% of pts. the field centers should have been corrected when the clips were taken in consideration. In the pts. in whom the boost dose planning were done according to the incision scars and clinical findings and the homogeneity correction was not done, dose-volume that took the 75%, 50% and 25% of the target dose were 0-2%, 0-4%, 0-9% respectively. But if the clips were considered and the homogeneity was corrected the volumes were 0-5%, 2-11%, 6-32% respectively.

Conclusion: This study demonstrates that surgical clips and CT scan usage are important to correct the lung tissue volume doses and to do optimum boost treatment planning.

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Re-evaluation of the study design of the phase I clinical trial with BNCT for patients with glioblastoma at the High Flux Reactor Petten (EORTC protocol 11961)

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A radiation dose escalation study on Boron Neutron Capture Therapy (BNCT) was started in 1997 at the Petten epithermal neutron facility, using BSH as boron carrier with 10 glioblastoma patients/cohort in 4 steps, escalating the boron dose defined in the point of the maximal thermal neutron fluence in the head. The other component of this binary system, the 10B content is kept constant in the blood. The systemic toxicity due to BSH was reported during the BNCT and in 3 months thereafter. Acute radiation toxicity is recorded within 90 days after BNCT and late radiation morbidity is detected in a minimum of 6 months. After the treatment of the first ten patients the study design was re-evaluated. The definitions of goals, end points, trial termination, recruitment, unacceptable toxic events and how to interpret the detected toxicity have been stated more precisely, separating the investigation of the feasibility using BSH and the establishment of the qualitative and quantitative radiation Dose Limiting Toxicity (DLT) and the Maximum Tolerated radiation Dose (MTD) under the defined conditions. In addition to the defined quality management of the trial further steps were introduced in order to achieve the maximal unbiased objectivity in the evaluation and interpretation of the detected toxicity.

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Comparative study between respiratory gated conventional 2-D plan and 3-D conformal plan for predicting radiation hepatitis

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Purpose: To evaluate influences associated with radiation treatment planning obtained with the patient breathing freely.

Methods: We compared reduction or elimination of planning target volume (PTV) margins with 2-D conventional plan with inclusion of PTV margins associated with breathing with 3-D conformal therapy. The respiratory non gated 3-D conformal treatment plans were compared with respiratory gated conventional 2-D plans in 4 patients with hepatocellular carcinomas. Iso-