56.
THE ROLE OF EXTERNAL IRRADIATION IN POSTOPERATIVE TREATMENT OF SOFT TISSUE SARCOMAS – LAST DECADE OF GLIWICE EXPERIENCE

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Aim of the study was to evaluate the role of postoperative external irradiation in the treatment of patients with high risk of local relapse of soft tissue sarcomas, as well as to evaluate the long-term results of this combined treatment. Data charts of the 77 patients with STS treated by surgery and postoperative external beam radiotherapy in Institute of Oncology in Gliwice during the period 1990-1999 has been reviewed. Extremity was the most frequent tumour site (75%), followed by trunk (10%), pelvis (7%), head and neck (4%) and retroperitoneal space (4%). Histological types included liposarcoma (27%), MFH (23%), fibrosarcoma (22%), neurosarcoma (12%), synovial sarcoma (8%) and others (8%). Only in 52% of patients the grade of the tumour was evaluated (G1-12 pts, G2-14 pts, G3-14 pts). Only 23 patients (30%) was treated by chemotherapy after local treatment. In majority patients were primary operated at general surgery departments, outside the reference centre with technique typical for benign tumours. Because of non-radical first surgical treatment and large number of early local recurrences in a whole group over 140 operations has been undertaken. Surgical margins were proven by histological procedures only in 29% of the patients. Long term OS, DFS and LC rates have been 64%, 56% and 69% respectively. Distant metastases have occurred in 30% of pts. during the first 2 years of observation. Prognostic factors have been evaluated in both univariate and multivariate analysis. The most important positive prognostic factors were as follows: radical surgical treatment and concomitant chemo-radiotherapy.

The first, often proven or suspected as non-radical, tumour excision is the most important and probably independent negative prognostic factor for tumour cure and patient survival. For such clinical situations secondary surgical approach as a wide excision is recommended. Because of a large number of cases in analysed material with single or multiple local relapses decision of adjuvant therapy has to be considered individually. It seems that in such clinical situation, postoperative radiotherapy or aggressive radio-chemotherapy in cases with no clinically detected local relapse gives the best chance for survival. The long time of anamnesis, several surgical treatments of tumour relapses with no sarcoma policy stress the need to establish the general national rules for diagnosis and adjuvant treatment of soft tissue sarcomas.

57.
PHYSICAL AND DOSIMETRIC ASPECTS OF QUALITY ASSURANCE IN STEREOTACTIC RADIOTHERAPY

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A quality assurance system in stereotactic radiosurgery and stereotactic fractionated radiotherapy, concerning the physical and dosimetric aspects, may be divided into three elements: (1) the preparation of reliable basic data for the computerized treatment planning system; (2) a control of the accelerator parameters prior to patient treatment; (3) preparation of the optimal treatment plan with the treatment planning system.

Due to the small size of the beams formed by circular collimators (7.5-35mm diameter, BrainLab System) the smallest available detectors should be used for measurements – a diamond diode (0.3 mm thickness) and a 0.015 cm^3 ionization chamber (PTW Freiburg) are adequate to measure precisely TMR curves, beam profiles and output factors required for the treatment planning system BrainScan.

The full control of accelerator parameters (Clinac 2300 C/D) necessary to safely carry out the treatment requires a comprehensive list of tests (an extended list of weekly checks including Winston-Lutz test). Testing procedure carried out with a set of specialized devices (Med-Tec, Radak, BrainLab) takes about two hours. Proper accelerator check and regulations allow for very precise patient positioning.

Treatment planning (with the treatment planning system BrainScan) is based on a

series of CT and MR scans with target volume and organs at risk marked on each slice by the radiotherapist. The planner has to select the positions of isocentres (up to 3), collimator diameters, number and range of the arcs. Additional parameters for optimization procedure are the total dose proportions delivered by each arc. The treatment plan evaluation is based on the analysis of DVHs for target volume and also for organs at risk (orbits, optical nerves, brain stem) in order to minimize the dose and volume irradiated. It was accepted that the dose uniformity factor, defined as a ratio D_{min}/D_{max} within the target volume, should be not less than 0.8, and should approach 0.9 as much as possible.

The above-presented system of quality control, specifying tolerance limits of controlled parameters, assures safe and precise dose delivery in stereotactic radiotherapy.

58.
INFLUENCE OF TOTAL TIME OF SURGERY AND POSTOPERATIVE RADIOTHERAPY ON THE OUTCOME PATIENTS WITH ADVANCED LARYNGEAL CARCINOMA

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Aim: to evaluate influence of total time of combined treatment on locoregional outcome of treatment in group patients with larynx cancer.

Material/Methods: We performed retrospective analysis of 254 patients with with stage III or IV squamous cell carcinoma of larynx who were treated between 1993 and 1996. There were 236 men, 18 women, median age was 56.3 years . Surgery consisted of total laryngectomy and elective/ selective neck dissection. Patients postoperativly were irradiated in coventional way with total dose of 60 Gy. We used shrinking field technique with lateral opposed photon fields to tumor bed and upper-mid neck nodes. Supraclavicular regions (lower neck lymph nodes) were treated with an anterior field. Total time of combined treatment (from the surgery to the end of radiotherapy) was an average 92 days (range, 65 – 131 days). The interval between surgery and the beginning of radiotherapy was an average 45 days (range, 22 – 78 days) and time of irradiation was an average 45 day (range, 40 –74 days).

Results: Prolongation overall time of combined treatment beyond 90 days is strongly correlated with decreasing of locoregional outcome of treatment (p=0.00036). Also decreasing in outcome of treatment was noted when interval time between surgery and beginning of radiotherapy was more than 50 days (p=0.022) and when the time of irradiation was longer than 44 days (p=0.0026).

Conclusions: Decreasing of total time of combined treatment (surgery and postoperative radiotherapy) is crucial in patients with advanced cancer of larynx.

59.
VERIFICATION OF THE 3-D DOSE CALCULATION ALGORITHM DURING TOTAL SKIN ELECTRON IRRADIATION WITH THE ROTARY-DUAL FIELD TECHNIQUE

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Total skin electron irradiation is the commonly used procedure in the treatment of mycosis fungoides. The aim of this paper was to verify the elaborated algorithm for dose calculation during total skin electron irradiation with rotary-dual fields technique (TSEI-RD).

Material and method: Authors modified the 2-D algorithm published by Podgorsak taking account of dose distribution along the body midline and doses in the body on a larger depth than in the skin. Depth-dose function, beam profile were measured in TSEI-RD conditions (spoiler, source-skin distance SSD=350 cm, field size: 36 x 36 cm at 100 cm). Cylindrical vax phantom was used to calculate and then to measure the doses in a depth of 0.4 cm during exposure to the electron beam of 6 MeV (at the output of Clinac-2300CD accelerator). Phantom was rotating with the pre-calculated speed during constant exposure to two fields executed one by one in each fraction. Thermoluminescent detectors (TLD) were used for *in-phantom* dose measurements and Marcus ionization chamber was used for calibration of TLD. Dose homogeneity on the phantom surface was checked for three phantoms with different diameters of 20, 30 and 40 cm. Phantoms were irradiated at different rotating speeds.