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**Accelerated postoperative radiation therapy with weekly concomitant boost in high risk patients with squamous-cell carcinoma of the head and neck***M. Ozsahin<sup>1</sup>, J. Chevalier<sup>1</sup>, P. Pasche<sup>2</sup>, P. Coucke<sup>1</sup>, R.O. Mirimanoff<sup>1</sup>, A. Zouhair<sup>1</sup>*<sup>1</sup>Lausanne University Medical Center (CHUV), Radiation Oncology, Lausanne, Switzerland<sup>2</sup>Lausanne University Medical Center (CHUV), Otorhinolaryngology, Lausanne, Switzerland

**Purpose:** To assess the feasibility and efficacy of accelerated weekly 6 fractionated 66-Gy postoperative radiation therapy (RT) using a single fraction regimen from Monday to Thursday and a concomitant boost in the Friday afternoon sessions in patients with squamous-cell carcinoma of the head and neck (SCCHN).

**Materials and methods:** Between December 1997 and July 2001, 68 (male to female ratio: 52/16; median age: 60 years [range: 43–81]) consecutive patients (refusing to participate to the EORTC 22931 study comparing postoperative RT vs. RT plus chemotherapy) with pT1-pT4 and/or pN0-pN3 SCCHN (24 oropharynx, 19 oral cavity, 13 hypopharynx, 5 larynx, 2 maxillary sinus, 2 salivary gland, and 3 unknown primary) were included in this prospective study. Postoperative RT was indicated because surgical margins were not free of tumor in 20 (29%) patients, extranodal infiltration was observed in 20 (29%) patients (both present in 23 [34%]), in two patients (3%) because of lymphangitis, and in 3 patients (5%) because of other reasons. RT consisted of 66 Gy in 5 1/2 weeks. Prophylactic percutaneous endoscopic gastrostomy was applied in 19 patients. Median follow-up was 15 months.

**Results:** All but one patient (not finishing the treatment because of non treatment-related reasons at 56 Gy) received the planned total dose without unplanned interruption. Acute morbidity was acceptable: grade 3 mucositis in 15 (22%) patients, grade 3 dysphagia in 19 (28%) patients, grade 3 skin erythema in 21 (31%) patients, and a median weight loss of 3 kg was observed (range: 0–16). No grade 4 toxicity was observed. Considering the late effects, grade 3 xerostomia was observed in 6 (8%) patients, grade 3 edema in 2 (0.2%) patient. In a median follow-up period of 13 months, only 3 (4%) local and 4 (6%) regional relapses were observed, and 8 (12%) patients developed distant metastases (all locoregionally controlled). The 2-year overall and disease-free survival and actuarial locoregional control rates were 85%, 73%, and 83%; respectively. **Conclusion:** We conclude that reducing the overall treatment time using postoperative accelerated RT by weekly concomitant boost (6 fractions per week) is easily feasible with a good local control, and acute and late RT-related morbidity is highly acceptable. Given the disease progression pattern (distant metastases), adjuvant chemotherapy should be considered.

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**Optically guided intensity modulated radiotherapy for the head and neck***R.R. Patel<sup>1</sup>, W.A. Tome<sup>1,2</sup>, S.P. Tannehill<sup>1</sup>, P.M. Harari<sup>1</sup>, B.R. Paliwal<sup>1,2</sup>, M.P. Mehta<sup>1</sup>*<sup>1</sup>University of Wisconsin Medical School, Department of Human Oncology, Madison, U.S.A.<sup>2</sup>University of Wisconsin Medical School, Department of Medical Physics, Madison, U.S.A.

**Purpose:** In this work we report on the use of an optical guided system for intensity modulated radiotherapy (IMRT) to the Head and Neck.

**Method:** An IMRT treatment plan is generated using seven coplanar beams, spaced uniformly, every 40 degrees along a 240-degree arc starting at an angle of 60 degrees and ending at an angle of 240 degrees, going counter clockwise using the IEC convention in the stereotactic space established by an optically guided system. The posterior 120-degree avoidance region is necessary so that the treatment beams do not enter through a six-degree of freedom couch mount used to position the patient. Treatment plans were generated utilizing a novel, three-step optimization procedure that consists of (a) finding an ideal mathematical solution to the inverse problem, (b) converting the ideal solution into MLC segments, and (c) optimizing the segment weights of all MLC segments for all beams simultaneously using the objective function that was employed for the ideal inverse solution.

**Results:** The use of an optical guided system in conjunction with the IMRT treatment planning technique described above allows generation of highly conformal Head and Neck treatment plans that exhibit conformal avoidance of critical structures and adequate coverage of target structures with an

inhomogeneity index that is within generally accepted limits. Of the eight patients treated using this technique three patients had no change from baseline salivary gland function, while five patients reported slight dryness of mouth but had good response of salivary gland function upon stimulation. **Conclusions:** Optical guided technology improves the accuracy of patient localization relative to the linac isocenter and allows real-time monitoring of patient position during treatment. These IMRT plans can be safely and effectively delivered. IMRT planning provides the user the ability to conformally avoid critical structures. It therefore, enhances the normal tissue sparing as well as provides a high degree of conformality. Additionally, optically guided technology also provides improved interfraction patient localization and online monitoring of patient position within a tolerance band  $\pm 0.3$ mm translational error and  $\pm 0.3$ -degree rotational error during treatment delivery.

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**High dose rate interstitial brachytherapy for oropharynx cancer***T. Nose<sup>1</sup>, K. Yoshida<sup>2</sup>, M. Koizumi<sup>1</sup>, K. Nishiyama<sup>1</sup>, T. Inoue<sup>3</sup>*<sup>1</sup>Osaka Medical Center for Cancer and Cardiovascular, Radiation Oncology, Osaka, Japan<sup>2</sup>Osaka National Hospital, Radiology, Osaka, Japan<sup>3</sup>Osaka University, Radiation Oncology, Osaka, Japan

**Objective:** To improve local control and to lessen external beam radiation sequelae, we started high dose rate interstitial brachytherapy in 1993.

**Patients and Methods:** From 1993 through April 2001, we treated 51 lesions of oropharynx squamous cell carcinomas in 50 patients (45 males and five females). Based on Pernot's criteria, we classified 29 lesions as group A (soft palate, tonsil and posterior pillar carcinomas), 13 as group B (anterior pillar and glossotonsillar sulcus carcinomas) and nine as group C (base of tongue and vallecula carcinomas). Primary tumors are categorized as T1; six, T2; 32, T3; 12 and T4; one. For implants, we applied Nancy school techniques. During implant, we inserted metal markers around the tumor to reconstruct CTV by X-ray films. At planning, we optimized dwell times manually with two principles. 1; An isodose surface as near to 85% basal dose as possible covers CTV. 2; Hyperdose sleeve smaller than 0.8 cm. For dose prescription, we selected an isodose surface that covers the reconstructed CTV. For the mandible protection, we used lead shields when indicated. All the 51 lesions were treated by hyperfractionated high dose rate interstitial brachytherapy; 41 lesions in combination with external beam and 10 as monotherapy. Except early cases, brachytherapy doses were 18-30 Gy / 3-5 fr / 2-3 days following 45 Gy external beam for groups A and C while 48-54 Gy / 8-9 fr / 5-7 days as monotherapy for group B. Follow-up ranges from one through 81 months with the median 20 months.

**Results:** We achieved 85.7% of the five-year local control rate for the entire group. Five-year cause specific and overall survivals were 85.5% and 57.9%. Transient soft tissue necrosis (mostly superficial erosion) was observed in 41.2% but none developed bone complications.

**Discussion:** Compared to definitive external beam series, superior local control was achieved. Xerostomia and taste loss seemed much improved. Compared to low dose rate interstitial series, local control and complications were almost equivalent. Our principles for dose planning above were sometimes difficult to achieve with uniform dwell time setting. Stepping source technology enabled us to better conform CTV with avoiding excessive hyperdose sleeve by changing dwell times manually.

**Conclusions:** High dose rate interstitial brachytherapy can be the first-line treatment of oropharynx carcinomas with traditional implant techniques and modern technology.

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**Accelerated radiotherapy combined with chemotherapy in the treatment of anaplastic carcinoma of the thyroid***R. De Crevoisier, E. Lartigau, E.T., J.P. Baudin, M. Schlumberger, C. Haie-Meder, F. Eschwège  
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**Purpose :** To analyze toxicity and efficiency of a protocol combining surgery, chemotherapy and bi-fractionated radiotherapy (RT-CT) in anaplastic thyroid carcinoma (ATC).

**Patients and methods :** 32 ATC patients (pts) with a mean age of 60 years (40-79) were treated in a phase I-II trial between 1990-2001. Tumor extended beyond the capsule gland in 29 pts, with tracheal extension in 9. Lymph node metastases were present in 20 and lung metastases in 6. Surgery was performed before RT-CT in 22 and after RT-CT in 3 and tumor resection was macroscopically complete in 14 pts. Two cycles of chemotherapy combining doxorubicin (60 mg/m<sup>2</sup>) and cisplatin (120 mg/m<sup>2</sup>) every 4 weeks