edition compared to 7.5% (overall), 8.6% (asians), and 7.6% (caucasians) for the 5th edition. Balance was considerably better for 5th than the 4th edition across all subgroups.

Conclusions: These data strongly indicate that the 5th edition TNM performs better overall, and for both asian and caucasian groups compared to the 4th edition TNM in a single institution outside Southeast Asia. Race and histology did not add independent prediction of outcome by stage in this series.

100 POSTER

Radiotherapy for oropharyngeal cancer. Results from 1998 to 2001 with emphasis on the correlation between treatment technique and side effects

K. Jensen, C. Grau. *Århus University Hospital, Oncology, Århus C, Denmark*

Introduction: January 1999 we changed strategy in our treatment of small lateralized oropharyngeal and oral cancers (retromolar trigone, anterior faucial pillar and tonsil without involvement of the floor of the mouth, tongue muscle and soft palate) and unilateral lymph node involvement, from bilateral parallel opposed fields to one of oblique wedged unilateral fields, treating only the ipsilateral elective lymph nodes.

Methods: The investigated population consists of all patients referred to our department for treatment of oropharyngeal cancer between January 1st 1998 and December 31st 2001. After treatment the patients entered follow up and side effects was continuously registered according to normal DAHANCA procedure. In the investigated period we received 115 patients with oropharyngeal cancer. There were 81 (70%) males 34 (30%) females. One hundred and four (90%) was treated with curative intent. Radical treatment was planned on our dose planning system (Helax TMS). The standard regimen included a total radiation dose of 66-68 Gy to tumor planning target volume and 46-50 Gy to elective lymph nodes, 6 fractions per week, 2 Gy pr. fraction, and nimorazole. Patients were treated on a linear accelerator using 4-6 MV. Ipsilateral treatment consisted of 2 wedged fields was given to 31 patients. Bilateral treatment (73 patients) consisted of two opposing beams for the large fields and opposing orthogonal or oblique fields for the boost.

Results: Stage distribution was not significantly different between the ipsilateral and the bilaterally treated group (St. I: 0%/ 4% St. II: 23%/ 20% St III: 32%/ 31% and St. IV: 45%/ 46% respectively). There was a significant difference in xerostomia ($p<0.001$) with moderate or severe xerostomia in 52% of the unilateral treated and 89% of the bilateral treated patients. Dysphagia was significant or intense for 51% and 80% respectively. This result was also significant ($p<0.21$) in favor of unilateral treatment. In the unilateral treated group there was no nodal recurrence in the contralateral lymph node regions. There was 4 recurrences among the 31 unilaterally treated patients: One recurrence in the contralateral base of tongue in a patient with midline-structure involvement, one recurrence in primary involved N-site after CR, one PR at N site and one patient recurred with distant metastasis and out of field lymph node metastasis. These patients are dead from disease.

Conclusion: Unilateral radiotherapy of selected cancers in the tonsillary region seems safe concerning local control and survival and more lenient concerning xerostomia and dysphagia.

101 POSTER

Accelerated postoperative radiation therapy with weekly concomitant boost in patients with advanced head and neck cancer

M. Ozsahin[1], D. Azria[1], P. Pasche[2], P. Coucke[1], R. Stupp[3], J. Chevalier[1], R.O. Mirimanoff[1], A. Zouhair[1]. *[1]Centre Hospitalier Universitaire Vaudois (CHUV), Radiation Oncology, Lausanne, Switzerland; [2]Centre Hospitalier Universitaire Vaudois (CHUV), Otorhinolaryngology, Lausanne, Switzerland; [3]Centre Hospitalier Universitaire Vaudois (CHUV), Medical Oncology, Lausanne, Switzerland*

We wanted to assess the feasibility and efficacy of accelerated weekly 6 fractionated 66-Gy postoperative radiation therapy (PORT) using a single fraction regimen from Monday to Thursday and a concomitant boost in the Friday afternoon sessions in patients with advanced head and neck cancer (AHNC). Between December 1997 and June 2002, 89 (male to female ratio: 68/21; median age: 60 years [range: 36–81]) consecutive patients (refusing to participate or ineligible for the EORTC 22931 study comparing PORT vs. PORT plus chemotherapy) with pT1-pT4 and/or pN0-pN3 AHNC (28 oropharynx, 26 oral cavity, 18 hypopharynx, 6 larynx, 5 unknown primary, 4 salivary gland, and 2 paranasal sinus) were included in this prospective study. PORT was indicated because surgical margins were not free of tumor (n = 22) or for T4 tumors (n = 4) in 26 (29%) patients; or because of extranodal infiltration with (n = 33) or without (n = 30) positive surgical margins in 63 (71%) patients. Median interval between surgery and RT was 6 weeks (3-15). RT consisted of 66 Gy (2 Gy/fr.) in 51/2 weeks. Median RT duration was 39 days (range: 35-67). Prophylactic percutaneous endoscopic gastrostomy was applied in 26 (29%) patients. Median follow-up was 21 months (range: 2-59). 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 20 (22%) patients, grade 3 dysphagia in 22 (25%) patients, grade 3 skin erythema in 18 (20%) patients. Median weight loss of was 2 kg (range: 0-14.5). No grade 4 toxicity was observed. Considering the late effects, grade 0, 1, 2, or 3 xerostomia was observed in 15 (17%), 57 (64%), 11 (12%), and 6 (7%) patients, respectively; grade 0, 1, 2, and 3 edema in 29 (33%), 46 (52%), 12 (13%), and 2 (2%) patients, respectively. Median time to locoregional relapse was 10 months (range: 2-21); only 4 (4%) local and 9 (10%) regional relapses were observed, and 18 (20%) patients developed distant metastases (all locally controlled but with regional relapses in 4 cases). The 2-year overall, cause-specific, and disease-free survival rates were 70%, 75%, and 63%, respectively; and 2-year actuarial-local and locoregional control rates were 94% and 80%, respectively. Distant metastasis probabilities at 2 and 4 years were 20% and 38%, respectively. Univariate analyses revealed that pT-stage, 3 or more lymph node metastases, and extranodal extension in 2 or more lymph nodes were significant. Multivariate analysis (Cox model) revealed that pT-stage (pT1, 2 vs. pT3, 4) and extranodal extension (0, 1 vs. 2 or more) were the two factors independently influencing the outcome. We conclude that reducing the overall treatment time using accelerated PORT by weekly concomitant boost (6 fractions per week) is easily feasible with excellent local control. Acute and late RT-related morbidity is highly acceptable. Given the disease progression pattern (distant metastases), adjuvant chemotherapy should be considered.

102 POSTER

Late normal tissue sequelae and performance status with brachytherapy or surgery in tonsillar fossa and soft palate tumors. Can we be more selective?

P. Levendag, W. Nijdam, I. Noever, C. Braat, M. Pol, P. Schmitz, M. Boer de, P. Jansen. *Erasmus MC - Daniel den Hoed Cancer Center, Radiation-Oncology, Rotterdam, The Netherlands*

Background: This paper focuses on late normal tissue sequelae and functional performance in tonsillar fossa (TF) and soft palate (SP) tumors. Arguments are presented for a more selective treatment strategy while maintaining excellent tumor control.

Materials/Methods: From 1986-2001, T1-3 TF/SP tumors were treated by ERT to the primary and neck, followed by HDR-BT (primary tumor) and a neck dissection (ND) in case of N+ disease (BT-group; 104 patients). If BT is not feasible, surgery is performed with postoperative ERT (S-group; 86 patients). Local control (LC), regional control (RC), disease free survival (DFS) and overall survival (OS) were calculated according to Kaplan Meier. Late side effects are scored by RTOG criterion. Univariate (UV)- and multivariate (MV) Cox regression analyses were performed for regional failure (RF) and late mucosal side effects (ulcer), with parameters sex, age, site, T/N-stage, modality, dose, and OTT. To determine Performance Status Scores (PSS), a survey was conducted among patients alive and NED after a minimum of 2 years of FU (BT-group 30; S-group 27). A research nurse interviewed patients regarding eating in public (EPub), normalcy of diet (NDiet), understandability of speech (USpeech) and xerostomia (visual analogue score [VAS] and 4 validated queries).

Results: Control percentages BT vs. S: LC 88 vs.88, RC 93 vs.85, DFS 57 vs.52, OS 67 vs.57. MV-analysis for RF was significant for T2 vs.T3 (HR 0.09, 95% CI 0.01-0.83) and for dose neck > 46 Gy (HR 8.7, 95% CI 1.3-57.1). Late side effects BT vs. S: Ulcer 39% vs.7%, trismus 1% vs.21%. MV-analysis for ulceration was significant only for BT (HR 4.1, CI 1.6-10.5). Ulcers showed complete healing in 88% (median duration 6 months). Median PSS BT vs. S: EPub, 50 vs. 50 ($p=0.97$), NDiet, 50 vs. 60 ($p=0.89$), USpeech, 100 v. 75 ($p=0.34$). Xerostomia: median VAS 5.5 (BT; range 0-10) and 6 (S-group; range 2-10). In the majority of the BT (72%) and S (73%) patients the answers to the 4 standardized queries were associated with their xerostomia complaints.

Conclusions: Excellent LR control was obtained with either modality: 84% (BT) vs.78%(S). BT patients fared better in understandability of speech (100 vs. 75). Late side effects were not negligible (ulcer [BT], fibrosis / trismus [S], both groups being equally affected by xerostomia). Fortunately,

BT induced ulcers healed spontaneously in 88%. Only 6 recurrences were observed in the 149 electively treated CL necks with no relapses in 29 non-treated CL N0 necks. Given the morbidity of xerostomia and the low recurrence rates in the CL necks, we will optimize our organ preservation protocol by refraining from treatment of the CL N0 neck if the GTV of the tumor does not surpass the midline of the SP. Also, with CT-based neck level standardization, IMRT techniques are implemented to further reduce the dose to salivary glands and oral mucosa.

103 POSTER

Comparative study between intravenous and subcutaneous amifostine administered for the prevention of radiation induced toxicities in patients with head and neck cancer

M. Synodinou-Menegaki, D. Antonadou, N. Coliarakis, G. Sarris, M. Paraskevaidis, K. Kyprianou, D. Misailidou, H. Athanassiou, K. Chrysanthou, P. Karageorgis. *Hellenic Group for Clinical-Radiation Oncology (He.G.C.-R.O.), Radiation-Oncology, Athens, Greece*

Purpose: The purpose of this prospective randomized study was to evaluate the efficacy and tolerance of the intravenous (IV) and subcutaneous (SC) amifostine administered for the prevention of xerostomia and mucositis in patients (pts) with Head and Neck (H&N) cancer receiving radiotherapy (RT) with curative intent.

Material and Methods: A total of 96 patients with H&N cancer received conventional RT (1.8-2.0 Gy qd, 5days/week, for 6-7 weeks). Tumours of the larynx (supraglottic) and oral cavity were most frequent and stage III was predominant. Patients were randomized to receive amifostine at 500 mg flat dose prior to each radiotherapy fraction, either IV (n=44) or SC (n=52). Antiemetic premedication was given prior to amifostine in both groups. Acute RT-induced toxicities were evaluated according to the RTOG toxicity scoring system.

Results: The two groups were evenly balanced concerning demographic data. The median total RT dose administered was 60Gy in both groups. The incidence of Grade 3 acute xerostomia, oral mucositis and pharyngitis was not significantly different between the two groups during RT and remained low in all cases (see table). Only 3/96 pts (1 IV and 2 SC) discontinued RT due to treatment-related toxicity. Recorded delays due to RT-induced toxicities were similar: 3/44 pts (6.8%) in the IV group and 2/52 pts (3.8%) in the SC group. Mean RT duration was 42.7±5.2 days (IV group) and 44.8±7.9 days (SC group) (p=0.143).

Administration of amifostine was well tolerated in both arms, since only 4 pts discontinued the drug: 2 in the SC (1 for emesis and asthenia, 1 for skin rash with fever) and 2 in the IV group (1 for hypotension, 1 for skin reaction).

Seventy-two patients (37 IV, 35 SC) were evaluated for response to RT, which was not significantly different between the two groups: CR in 20/37 IV pts (54.1%) and 21/35 SC pts (60%).

Table: Incidence of Grade 3 acute toxicity, by treatment weeks 5-6

	SC Amifostine	IV Amifostine	P value
Salivary glands	6/52	3/44	0,501
Mucosa	7/52	2/44	0,173
Pharynx	5/52	4/44	0,999

Conclusion: Amifostine is an effective and well tolerated radioprotective agent in patients receiving RT for H&N cancer, independently of the route of administration (IV or SC).

104 POSTER

Oral cavity verrucous carcinoma

C. Kang[1,3], T. Chang[2,3], T. Chen[1,3], I. Chen[1,3], C. Liao[1,3]. [1]*Chang Gung Memorial Hospital, E.N.T. & Head and Neck Surgery, Taoyuan, Taiwan;* [2]*Chang Gung Memorial Hospital, Radiation Oncology, Taoyuan, Taiwan;* [3]*Chang Gung Memorial Hospital, Taipei Chang Gung Head & Neck Oncology Group, Taoyuan, Taiwan*

Background: To evaluate the outcome of patients with oral cavity verrucous carcinoma under primary surgery treatment, and to assess the risk of lymph node metastasis.

Material & Methods: From March 1993 to July 2001, 112 patients with oral cavity verrucous carcinoma received surgery as primary treatment. One hundred and seven (96%) patients were male and the median age was 52 (ranging from 33 to 51). Only 6 patients had no consumption habits of betel nut, cigarette and/or alcohol. Most common tumor site within oral cavity is buccal mucosa (51.8%). The distributions of tumor stage were T1: 31, T2: 38, T3: 27 and T4:16. Only 2 patients had palpable cervical adenopathy at initial examination, one in T3 and the other in T4. Wide excision with 1 cm margins was the standard procedure of surgery. Mandibulectomy and/or maxillectomy were done to get the adequate margins. Selective neck dissections were done in 38 patients. Sixty eight patients received free flap for reconstruction. Postoperative radiotherapy was delivered in 8 patients for close margins.

Result: No neck node metastasis in the pathology examination after neck dissection. The local and regional tumor controls were 100%. Seven patients had secondary squamous cell carcinoma and 2 of them died of secondary cancer. The 3-year overall survival was 94.8% and 5-year survival was 82.8%.

Conclusion: Surgical excision alone is an effective treatment modality for verrucous carcinoma. Selective neck dissection is not necessary even in advanced stage. Echo guided biopsy should be a treatment choice for clinical suspicious neck node before neck dissection.

105 POSTER

Glottic cancer and the impact of the duration of symptoms

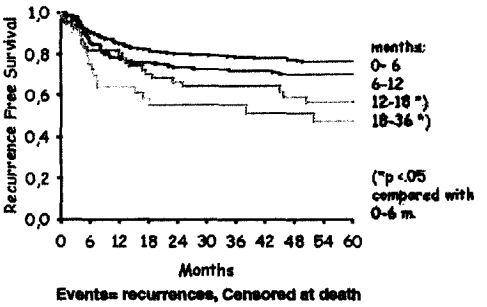
O. Hansen[1], K.E. Jorgesen[2], S. Larsen[1], L. Bastholt[1]. [1]*Odense University Hospital, Oncology, Odense, Denmark;* [2]*Odense University Hospital, ENT, Odense, Denmark*

Studies of the impact a delay before start of radiotherapy (RT) have resulted in conflicting reports.

Patients with glottic cancer (GC) constitutes a homogenous group of patients with hoarseness being an absolutely dominating symptom with an onset that is simple to record. A study of the relationship between duration of symptoms (DoS) before start of treatment and the recurrence free survival (RFS) therefore seem to be relevant.

Material and methods: From 1965-1999 693 patients with GC were treated with radical RT. Data from the patients were registered prospectively in a medical database. In 1991 the data was moved from the original computer platform to PC databases (MEDLOG). All patients were retrospectively restaged according to UICC 1997. Among the data recorded prospectively were the symptoms and the date of onset of symptoms.

Results: The most frequent initial symptom was hoarseness (97.4% of the cases) followed by throat irritation (3.8%), otalgia (1.7%), cough (1.7%), dyspnoe(1.6%), dysphagia (0.9%), weight loss (0.7%), tumour (0.3%), and other (1.7%). The median DoS (mDoS) was 4.8 months (m). 34 cases (5%) that reported the duration of symptoms 36m or more, and 17 cases (2%) with missing information on DoS were excluded leaving 642 cases for analysis. No differences were observed between men and women: mDoS females 4.9m, males 4.5m (p= ns). The mDoS increased with stage: st.I 4.3m (no.=295), st.II 4.3m (no.=231), st.III 5.1m (no.=86), st.IV 8.3m (no.=22, p<0.05 compared with stage I and with stage II). The mDoS depended on the period of treatment: 1965±79 4.1m (no.=188), 1980±89 4.2m (no.=202), and 1990±99 5.1m (no.=265). The RFS decreased when mDoS increased. COX analysis showed DoS, stage and dose to be significant factors (each p<0.0001), while Gy per day, gender, year of treatment, and age were not significant (p=0.46-0.71). The relative risk for DoS was 1.05 (1.03; 1.08).



Glottic Cancer. Recurrence free survival vs duration of symptoms.

Conclusion: The DoS was statistically significant related to a decrease in RFS. 1 month in delay from onset of symptoms to start of RT was equivalent to a 5% decrease in RFS.