with/without adjuvant /maintenance chemotherapy. The prescribed dose was 70-73.5 Gy to gross tumor volume (GTV), and 66-70 Gy to enlarged neck nodes (GTVLN). All doses were given in 35 fractions over 7 weeks.

Results: Patient characteristics: median age 42; 71% male; 92% World Health Organization III; 10% Stage I, 19% Stage II, 43% Stage III, 28% Stage IV. The median follow-up was 41 months (range, 6 - 53 months). All living patients were followed for at least 11 months. There were 15 local-regional failures: 11 local failures, 5 regional failures, and 1 failure both in the primary tumor and regional lymph node. There were 24 patients who failed distantly. The 3-year overall survival, local progression-free survival, locoregional progression-free survival, and distant disease-free survival rates were 93%, 94%, 92%, and 86%, respectively. The median time from treatment completion to local-regional recurrence was 23 months (range, 8 to 48 months). There was 96.6% local control for Stage T1/T2 disease, compared to 88.6% for T3/T4 disease ($p = 0.049$). For the 75 patients treated in 2003 with three-dimensional planning (3D) and chemotherapy. The 3-year overall survival, local progression-free survival, locoregional progression-free survival, and distant disease-free survival rates were 88%, 93%, 92%, and 92%, respectively ($p > 0.05$). We protected submandibular gland and oral cavity for the 3D patients, and protected parotid gland for the IMRT patients. For patients with >1 year follow-up (IMRT 114 patients, 3D 60 patients), rates of long-term xerostomia none, Grade 1, and Grade 2 were 18%, 65%,and 17% for the IMRT group respectively compared with 13%, 62% and 25% for the 3D group ($p > 0.05$).

Conclusions: The advantage of IMRT over 3D RT in treating NPC patients is not significant in survival and xerostomia in our series. We should give higher dose for the T3/T4 patients to get benefit from IMRT. The increased oral cavity and submandibular gland doses in the IMRT era may explain the little saliva preservation benefit even with parotid gland protection.

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2470 Accelerated Fractionation and Concurrent Carboplatin in Patients with Locally Advanced Squamous Cell Carcinoma of the Head and Neck

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Purpose/Objective(s): Acceleration and synchronous chemotherapy independently improve local control (LC) in squamous cell carcinoma (SCC) of the head and neck. Accelerated hypofractionated radiation (55 Gy in 20 fractions) with carboplatin utilizes both these approaches and treatment completes prior to accelerated repopulation. Radiobiological modeling also predicts 55 Gy in 20 fractions to have lower late toxicity compared to 70 Gy in 35 fractions. We determine the local control (LC), overall survival (OS) and toxicity with this regimen.

Materials/Methods: All patients (pts) with biopsy proven squamous cell carcinoma of the larynx, oropharynx, oral cavity and hypopharynx (UICC stages II-IV) prescribed 55Gy in 20 fractions with carboplatin were identified through a prospective database. Radiotherapy was delivered using conventional (2 dimensional) or CT planning. Carboplatin was administered on days 1 and 21 as an outpatient. Clinical data, collected retrospectively, included toxicity graded according to National Cancer Institute Common Toxicity Criteria. Outcome measures were LC, OS and disease free survival (DFS) calculated (Kaplan-Meier method) from the date of starting radiation.

Results: All 110 pts identified were analyzed and 107 pts completed 20 fractions with 77 pts (71%) completing radiation within 25 days. UICC stage distribution was as follows: stage II 13 pts (12%), stage III 30 pts (27%) and stage IV 67 pts (61%). Median follow up was 12 months and median age 58 years. Toxicity data was available for 105 pts. Grade 3/4 toxicity was as follows: anemia 4 pts, neutropenia 5 pts, thrombocytopenia 1 pt, nausea 5 pts, mucositis 81 pts and dysphagia 63 pts. One pt died during radiation due to airway obstruction. Prolonged mucositis (4 weeks or beyond) was seen in 8 pts. There were 2 cases of osteoradionecrosis. The 2 year LC was 77.2% (95% CI, 67.3% to 87.1%), 2 year OS 72.1% (95% CI, 60.8% to 83.5%) and 2 year DFS 65.2% (53.9% to 76.4%). When excluding patients with stage II oral cavity, larynx and hypopharynx tumors the 2year LC was 78.1% (95% CI, 67.5% to 88.7%), OS 73.0% (95% CI, 60.9% to 85.2%) and DFS 66.2% (95% CI, 54.2% to 78.2%).

Conclusions: Accelerated hypofractionated radiation to a dose of 55Gy in 20 fractions can be combined with carboplatin and offers a high rate of LC in locally advanced SCC of the head and neck. Such a regimen should be considered for prospective evaluation.

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2471 A Randomized Controlled Multicenter Trial of Actovegin Against Acute Oral Mucositis Induced by Chemo-radiotherapy for Nasopharyngeal Carcinoma

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Purpose/Objective(s): To evaluate the efficacy and safety of Actovegin against acute oral mucositis through a randomized controlled multicenter trial for nasopharyngeal carcinoma patients treated using radiotherapy combined with chemotherapy.

Materials/Methods: From February 2006 to May 2007, a total of 161 patients with newly diagnosed stage II-IVA (Chinese 1992 stage) NPC were enrolled in this study. These patients were randomly assigned to the prevention group, the treatment group and the control group. All patients received concomitant chemo-radiotherapy ± neoadjuvant chemotherapy. Radiation technique and dose was similar between the three groups. The prevention group when radiation started and the treatment group when grade 2 mucositis occurred during radiation received intravenous infusion of 30 ml Acovegin daily 5 times per week until the end of radiotherapy. Criteria of NCI CTC2.0 and VRS were used for evaluating acute oral mucositis and painful degree, respectively.

Results: One hundred fifty-four patients were eligible for analysis of the efficacy. Among them, there were 49 patients for the prevention group, 53 for the treatment group and 52 for the control group. Incidences of grade 3-4 mucositis and grade 2-3 pain in the prevention group and the control group were 30.6% and 55.8% ($p = 0.011$), 59.2% and 82.7% ($p = 0.009$), respectively. Compared with the control group of 48 patients with ≥ grade 2 mucositis, the treatment group also had a lower incidence of grade 3-4 mucositis (37.7% vs. 60.4%, $p = 0.023$) and grade 2-3 pain (69.8% vs. 89.6%, $p = 0.014$). The prevention group had a lower incidence ($p = 0.021$) and longer average interval ($p = 0.011$) of grade 2 mucositis compared with the control group. No any drug-related adverse event was observed.

Conclusions: Prophylactic or therapeutic use of Actovegin by intravenous infusion can significantly reduce the severity of chemoradiotherapy-induced oral mucositis and pain. The prophylactic use also may postpone the interval and decrease the incidence of grade 2 mucositis. It deserves to spread and apply in clinic.

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2472 The Utility of FDG-PET in the Management of Patients with Locally Advanced Adenoid Cystic Carcinomas of the Head and Neck Undergoing Neutron Radiotherapy

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Purpose/Objective(s): FDG-PET imaging is a valuable tool in the evaluation of head and neck squamous cell carcinomas. The role of PET imaging in salivary gland malignancies of the head and neck is not yet well-defined. We have reported high rates of local control in patients with locally advanced head and neck adenoid cystic carcinomas with skull base extension treated with fast neutron therapy followed by Gamma Knife boost. In this cohort of patients, we report our initial experience with the application of FDG-PET in staging, radiotherapy planning and follow up.

Materials/Methods: From March 2005 to March 2008, 13 patients with locally advanced head and neck adenoid cystic carcinomas received fast neutron radiotherapy and underwent FDG-PET/CT. Ten patients had primary neutron therapy for unresectable disease, and 3 were treated adjuvantly for positive margins. Median dose was 18.4 neutrons Gy. Ten patients received Gamma Knife boost to the skull base (median dose 12 Gy to the 50% isodose). All patients had T4 primary disease. Disease extent included base of skull invasion (7), orbit (4), cavernous sinus (5) and regional nodal metastases (2). Primary sites included the nasal/paranasal sinuses (6), nasopharynx (2), base of tongue (2), parotid (1), hard palate (1) and temporal bone (1). Mean primary tumor size was 4.8 cm (2.7-10.4).

Results: All patients completed the planned therapy and are alive at median follow up of 4 months (1-16). Eleven patients had pretreatment FDG-PET imaging (3 had repeat scans prior to Gamma Knife). All but one patient ($n = 10$) demonstrated hypermetabolic uptake in the primary tumor. FDG-PET sensitivity for detection of the primary was 91% with mean SUV 7.4 (3-13.9). FDG images were used to assist in delineation of neutron and Gamma Knife target volumes along with CT and MRI imaging. Of the 2 patients with regional nodal disease, 1 demonstrated hypermetabolic uptake and the other was FDG negative in pathologically involved subcentimeter nodes. Two patients have failed locally. Both had post-treatment PET imaging with FDG avid findings at the sites of recurrence (SUV 6 and 8.2). Overall freedom from locoregional progression is 83%.

Conclusions: Our initial experience suggests a promising role for FDG-PET in this subset of patients with locally aggressive T4 adenoid cystic carcinomas of the head and neck. There is a higher rate of FDG-avidity at the primary site than what is conventionally thought for this histology. FDG-PET imaging may also detect regional nodal involvement and disease recurrence. Based on these findings, we are planning a prospective study incorporating FDG-PET in the routine management of these patients to evaluate its impact on staging, radiotherapy planning, prognosis, and treatment outcomes.

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2473 Treatment of Nasopharyngeal Carcinoma using Intensity Modulated Radiotherapy - The National Cancer Centre, Singapore Experience

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Purpose/Objective(s): Between 2002 and 2005, we treated 195 nasopharyngeal carcinoma (NPC) patients with intensity modulated radiotherapy (IMRT). The aim of this study is to report the efficacy and acute toxicity of our early experience with this technique.

Materials/Methods: A review was conducted on case records of 195 patients with histologically proven, non-metastatic NPC treated with IMRT. Magnetic resonance imaging (MRI) of the head and neck was fused with computed tomography (CT) simulation images. All plans had target volumes at 3 dose-levels, with a prescribed dose of 70Gy to the gross disease, in 2 to 2.12 Gy/fraction over 33 to 35 fractions. Cisplatin-based chemotherapy was offered for stage III/IV patients.

Results: Median age was 52 years. 69% were male. Median follow-up was 25 months. One hundred twenty-three patients had stage III/IV disease (63%); 50 (26%) had T4 disease. One hundred and eighty eight (96%) had complete response; 7 (4%) had partial response. Of the complete responders, 10 (5.3%) had local recurrence, giving a 3-year local recurrence-free survival estimate of 91%. The 3-year disease free survival was 81%. 51 (26%) had at least one grade 3 toxicity.

Conclusions: Results from our series are comparable to those reported by other centers. Acute toxicity is common. Local failure or persistent disease, especially in bulky T4 disease, are issues which need to be addressed in future trials.

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2474 For Large Lateralized Head and Neck Tumors Intra-arterial Chemoradiation is Superior to Intravenous Chemoradiation

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Purpose/Objective(s): A previous reported trial on intra-arterial chemoradiation versus intravenous chemoradiation for inoperable head and neck cancer demonstrated no difference. Unilateral intra-arterial administration was however a positive predictor for outcome. The purpose of this study was to reveal the patients that can benefit from unilateral cisplatin chemoradiation.