

Results: see table. At 5 years cause specific survival is 69% for HPV pos group and 48% for HPV neg ($p=0.047$); overall survival is 69% and 43% respectively ($p=0.007$).

Conclusions: HPV pos SCCs of oropharynx confirm to have a better prognosis when surgery is the main treatment. On the contrary patients with HPV neg tumors are more susceptible of relapse and second tumors in upper aero digestive tract. These data add evidence to the hypothesis of a different pathogenesis among SCC oropharyngeal cancer implying possibly different therapeutic approaches as well as surveillance and prevention programs. *Supported in part by AIRC.*

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ORAL

The FDG standardized uptake value in predicting the outcome in head and neck cancer patients

A.S. Allal¹, D.O. Slosman², T. Kabbani¹, M. Allaoua², W. Lehmann³, P. Dulgerov³. ¹University Hospital of Geneva, Radioation Oncology, Geneva, Switzerland; ²University Hospital of Geneva, Nuclear Medicine, Geneva, Switzerland; ³University Hospital of Geneva, H&N surgery, Geneva, Switzerland

Background: Pre-treatment 2-[¹⁸F] fluoro-2-deoxy-D-glucose (FDG) uptake was evaluated as a predictor of local control (LC) and disease-free survival (DFS) in patients with head and neck cancer managed primarily either by radiotherapy (RT) or surgery.

Methods: In 120 patients, tumour FDG uptake using the Standardised Uptake Value (SUV) was measured prospectively using positron emission tomography (PET). Treatment consisted of either radical RT with or without chemotherapy (73 patients) or radical surgery with or without post-operative RT (47 patients). The correlation of LC and DFS with the maximum SUV values and with the other clinical and therapeutic variables was assessed by using the Kaplan-Meier method for univariate analysis and the Cox proportional hazards model for the multivariate analysis. Median follow-up of the surviving patients was 48 months.

Results: In the 46 patients who failed treatment, the median SUV was higher than in the remaining patients (5.8 vs. 3.6, $p=0.002$). In monovariate analysis, patients with tumours having high FDG uptake ($SUV > \text{median}$, 4.76) had poorer LC ($p=0.003$) and DFS ($p=0.005$). This difference was also observed when the RT and surgery groups were analysed separately. In the multivariate analysis T-category ($p=0.005$) and SUV ($p=0.046$) remained independent adverse factors for LC, whereas N-category ($p=0.004$), T-category ($p=0.02$) and SUV ($p=0.05$) were independent determinants of DFS.

Conclusions: This study suggests that pre-treatment tumour FDG uptake represents an independent prognostic factor in patients with head and neck cancers, whatever the primary treatment modality. Because the greater risk of failure, tumours having high FDG uptake should be considered for more aggressive multimodality therapy.

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Validation of CT-based Rotterdam/Brussels neck nodal delineation protocol cranial boundary of level II and relevance for sparing of the parotid gland

P. Levendag¹, H. Est van der¹, P. Voet¹, V. Gregoire², B. Heijmen¹. ¹Erasmus MC - Daniel den Hoed Cancer Center, Radiation-Oncology, Rotterdam, The Netherlands; ²St-Luc University Hospital, Radiation-Oncology, Brussels, Belgium

Purpose: Image guided high-precision radiation therapy (RT) for H&N tumors is frequently dependent on the 3D definition and delineation of the to be irradiated neck nodal levels. *Rotterdam* and *Brussels* have recently proposed CT-based consensus guidelines for the neck, based on surgical levels as defined by the American Academy of Otolaryngology¹. This paper specifically addresses the validation of the proposed cranial boundary of level II, that is the lateral process of vertebra C-I, given its relevance for sparing of the Parotid glands (PG).

Materials and Methods: Neck irradiation is not trivial, in particular because of the associated xerostomia². The selection of patients, in which the neck is to be irradiated, is based on generally accepted conventions³. Preserving salivary flow is related to the volume of the glands receiving a below threshold dose. *Rotterdam* and *Brussels* have recently translated the surgical levels of the neck unto CT. To validate the proposed CT-based guidelines, in our integrated operative suite a CT scan was obtained of a patient undergoing a neck dissection (ND). Before removing the (non-) lymphatic structures, surgical clips were placed at specific boundaries of neck levels and important anatomical marker structures. 2 mm CT-slices

were obtained in surgical position (twisted neck) as well as in RT treatment position (neck on RT base, head rectangular to tabletop). Additionally, validating the most cranial dissection margin (this paper), in 10 consecutive patients undergoing a ND, after placing a surgical clips at the cranial border of level IIB, AP- and lateral X-ray films were taken in the OR with the head in RT treatment position. Finally, 10 patients with a primary tumor in the tonsillar fossa were contoured on CT. The position of the cranial border of level IIB was varied 1cm above and below the consensus boundary and, using IMRT treatment techniques, dose volume histograms of the PG were generated.

Results: In general, the positions of the clips were consistent with the consensus guidelines. In a sagittal reconstruction of a CT taken in surgical position, the clips of level IIB were visualized at the base of skull. In RT position they were found at the level of the lateral process of vertebra C-I on sagittal CT-reconstruction as well as on the X-ray films (see panels below). The mean dose to the PG with the upper border of level IIB as proposed by the consensus guidelines was 25.6 Gy (16.0-30.9), at + 1 cm 30.8 Gy (20.8-37.1) and at -1cm 18.1 Gy (10.2-24.2).



Conclusion: The Rotterdam / Brussels CT-based neck consensus guidelines proposed the cranial boundary of level IIA/B to be at the level of the lateral process of vertebra C-I. The observed position of the clips in RT treatment position (CT, X-ray) proved the adequacy of this proposal. It is important to adhere to the proposed guideline, given the large impact of a small upward shift on the mean dose in the PG.

References

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ORAL

Integration of fractionated stereotactic radiation therapy into the management of nasopharyngeal carcinoma

J. Waldron¹, L. Gitterman¹, S. Ladak², S. McKinnon², M. Heydarian³, B. Cummings¹, A. Bayley¹, J. Kim¹, J. Ringash¹, B. O'Sullivan¹. ¹Princess Margaret Hospital, Radiation Oncology, Toronto, Canada; ²Princess Margaret Hospital, Radiation Therapy, Toronto, Canada; ³Princess Margaret Hospital, Clinical Physics, Toronto, Canada

Background: The management of nasopharyngeal carcinoma (NPC) requires the delivery of high dose radiation in close proximity to numerous organs at risk. This report describes the use of fractionated stereotactic radiation therapy (FSRT) with conventional conformal radiation therapy (CRT) for the initial management of NPC.

Materials and Methods: A review of 87 patients with NPC treated between 1997 and 2002 was conducted. All patients were undergoing initial curative management with a combination of CRT and FSRT. The treatment approach delivered 70 Gy to the primary site, 60 Gy to involved nodes and 50 Gy to nodal regions at risk. FSRT was used to deliver the final 10 to 20 Gy to the primary site. In selected cases with advanced primary tumours and nodal disease, FSRT to the primary site was commenced earlier and delivered concurrently with CRT. FSRT was planned using pre-treatment MRI's fused to the stereotactic planning CT. The PTV included the pre-treatment CTV plus a margin of 3mm where possible.

Results: 63 males and 24 females with a median age of 52 (range:17-78) were treated. T categories were: T0(1), T1(29), T2a(7), T2b(10), T3(15) and T4(25). Nodal involvement was present in 63/87 (72%). Median follow up was 1.6 years (range: 0.3 - 5.2). Three FSRT techniques evolved sequentially: 1) Radionics® XKnife® system of multiple arcing beams with circular collimation; 2) XPlan® system of multiple static beams defined by a minimultileaf collimator (MMLC) and finally 3) intensity modulated radiation therapy (IMRT) using the MMLC. The number of patients treated were: XKnife (18), XPlan (20) and IMRT (49). FSRT was delivered in three dose ranges: ≤ 10 Gy (45 patients), $>10 \leq 20$ Gy (17 patients), >20 Gy