interval [CI]: 64-89%) and 95.8% (95% CI: 90-100%) respectively. Thirteen pts presented LR failures, of which 4 had isolated local failure, 4 had isolated regional failure, 2 had local and regional failures, and 3 had simultaneous LR and distant relapses. Of 13 pts with LR relapse, only 1 (8%) had marginal failure, with the remaining 92% failing truly in-field within the high-dose region. No patient recurred in vicinity of spared PG, SMG or OC. Surgical salvage for LR failure was attempted in 5 pts. Contralateral PG was spared in 98% of pts and ipsilateral PG in 54%. Concerning SMGs, 18 (26%) contralateral glands were spared and the ipsilateral SMG was spared in 5 pts. In other 13 (19%) pts doses to the SMGs below 50 Gy were obtained. The OC was spared to a dose $\leq$40 Gy in 26 pts (37%). None of the pts developed permanent xerostomia higher than grade 2 at the last follow-up visit.
Conclusions: The majority of LR failures occurred in-field within the high dose region. Sparing SMGs and OC in addition to PGs does not seem to jeopardize the LR control in HNC IMRT.

PO-0672

The prognostic impact of pretreatment dual-phase 18F-FDG-PET SUVmax in nasopharyngeal carcinoma

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Purpose/Objective: To evaluate the role of pretreatment dual-phase ^{18}F-FDG-PET maximum standardized uptake (SUVmax) in predicting the outcome of nasopharyngeal carcinoma (NPC).
Materials and Methods: A total of 140 patients with newly diagnosed NPC were prospectively treated with IMRT plus neoadjuvant or concurrent chemotherapy between January 2006 and December 2008. Pretreatment SUVmax at 60 minutes (SUV1) and 150 minutes (SUV2) after injection of ^{18}F-FDG were collected. We investigated the effects of SUVmax of primary tumor (SUV1-primary, SUV-2-primary) and neck lymph nodes (SUV1-neck, SUV2-neck) on locoregional failure-free survival (LRFFS), distant metastasis failure-free survival (DMFFS) and overall survival (OS).
Results: In univariate analysis, the 5-year rate of OS for patients with SUV1-primary <12.9 was significantly higher than those with SUV1-primary ?12.9 (87.0% and 72.2%, *p*=0.044). SUV2-primary, SUV1-neck and SUV2-neck did not affect OS significantly. All SUVs of primary tumor and neck lymph nodes have significant effects on DMFFS (SUV1-primary < vs. ?12.5=89.1% vs. 70.8%, *p*=0.004; SUV2-primary < vs. ?12.8=88.6% vs. 76.4%, *p*=0.022; SUV1-neck < vs. ?8.1=91.0% vs. 71.8%, *p*=0.003; and SUV2-neck < vs. ?3.7=94.7% vs. 80.5%, *p*=0.024, respectively). All SUVs had no significant effect on LRFFS. In multivariate analysis, except for N stage, SUV1-primary, SUV2-primary and SUV1-neck were significantly independent predictors of DMFFS (hazard ratio=4.313, 95% CI=1.447~12.855, *p*=0.009; hazard ratio=4.399, 95% CI=1.514~12.785, *p*=0.006; and hazard ratio=3.769, 95% CI=0.985~14.420, *p*=0.053, respectively).
Conclusions: The SUV1- primary predicts OS by univariate analysis. The SUV1-primary, SUV2-primary and SUV1-neck were independently prognostic factors of distant failure.

PO-0673

Accelerated Helical Tomotherapy versus RapidArc in a head and neck cancer treatment planning study

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Purpose/Objective: To create Helical Tomotherapy (HT) plans for t treating patients with oropharyngeal cancer (OPC) with the same treatment time as RapidArc (RA) Volumetric Modulated Arc Therapy (VMAT).
Materials and Methods: We made both a double arc RA plan on Eclipse and a standard HT plan on TomoHD™ according to the ICRU 83 guidelines in 5 OPC patients. In 32 fractions, a simultaneous integrated boost technique was planned to deliver 69.12 Gy (2,16 Gy / fraction) to the high risk volume (PTV of the GTV + 1cm) and 56 Gy (1.75 Gy / fraction) to the PTV of the remaining primary tumor region and the bilateral elective lymph node regions. Guidelines for all the organs at risk (OARs) were given. By modifying the beam width from 2.5 cm to 5.0 cm, elevating the pitch and lowering the modulation factor, we created 'Tomo Fast (TF) plans in which treatment times were equal to those in the RA plans. The homogeneity index (HI), the conformity index (CI), the mean dose, the Dnear-max (D2) and the Dnear-min (D98) of the PTVs were analyzed as well as the mean dose and specific critical doses and volumes of 26 OARs . Differences between the individual plans of the treatment planning systems were analyzed using repeated measures ANOVA.
Results: With a mean treatment time of 3.05 min for RA and 2.89 min for TF , PTV_{boost} coverage was more homogeneous with TF (mean HI .07; SE .01) than with RA (mean HI .10; SE .01). while $PTV_{elective}$ was most homogeneous with RA. Mean doses to the parotid glands were identical for RA and TF: 25.62 Gy and 25.34 Gy for the contralateral and 32.02 Gy and 31.96 Gy for the ipsilateral gland, respectively. Spinal cord, cricopharyngeal muscle and cranial part of the esophagus received a lower mean dose when planned with TF, the glottic larynx when planned with RA. V20 of the lungs, mean dose of inner ears, brain and eyes, and the integral dose were higher with TF than with RA, probably due the 5 cm beam width related cranial-caudal gradient extension. For details, see enclosed Table.

	n		Tomo Fast mean	Tomo Fast SE	RapidArc mean	RapidArc SE	TomoHD mean	TomoHD SE	TF vs RA	TF vs HT	RA vs HT
Beam-on time (min)	5		2,89	0,06	2,50	0,00	5,94	0,37	<0.0001	<0.0001	<0.0001
Treatment time (min)	5		2,89	0,06	3,05	0,00	5,94	0,37			
Monitor Units	5		2383,60	56,51	414,80	16,32	5051,80	321,64	<0.0001	<0.0001	<0.0001
PTV 56	5	D2% (Gy)	67,08	0,26	63,41	0,76	67,14	0,29	0.0001	.	0.0001
		D5% (Gy)	65,76	0,32	61,81	0,66	65,55	0,42	<0.0001	.	<0.0001
		D50% (Gy)	56,07	0,03	56,69	0,11	56,01	0,03	0.0001	.	<0.0001
		D95% (Gy)	53,61	0,14	53,67	0,12	54,46	0,39	.	.	.
		D98% (Gy)	52,53	0,32	52,71	0,13	53,66	0,15	.	0.009	0.0004
(95% of 56 Gy)		V53.2 Gy (cc)	400,18	32,29	411,72	34,62	408,98	34,54	0.0064	0.021	.
(107% of 56 Gy)		V59.9 Gy (%)	21,18	1,54	10,39	2,24	18,52	1,75	<0.0001	0.0477	<0.0001
PTV 69,12	5	D2% (Gy)	71,02	0,14	72,09	0,13	70,91	0,16	<0.0001	.	<0.0001
		D5% (Gy)	70,63	0,12	71,65	0,09	70,45	0,13	<0.0001	.	<0.0001
		D50% (Gy)	69,15	0,05	69,31	0,02	69,10	0,01	0.0112	.	<0.0001
		D95% (Gy)	67,11	0,26	65,87	0,17	67,80	0,31	0.0002	0.0398	<0.0001
		D98% (Gy)	66,31	0,45	64,98	0,26	66,70	0,23	0.0019	.	<0.0001
(95% of 69,12 Gy)		V65.7 Gy (cc)	246,12	58,04	242,93	56,39	248,63	66,53	.	.	.
Homogeneity index	5	PTV 56	0,26	0,01	0,19	0,01	0,24	0,00	0.0007	0.0276	0.0086
		PTV 69	0,07	0,01	0,10	0,01	0,06	0,01	<0.0001	.	<0.0001
Conformity index	5	PTV 56	1,52	0,05	1,45	0,03	1,45	0,05	.	.	.
		PTV 69	1,33	0,05	1,10	0,02	1,33	0,05	0.001	.	0.001
PRV Spinal cord	5	D2% (Gy)	36,69	1,16	42,66	0,21	34,12	0,44	<0.0001	.	<0.0001
PRV Brainstem	5	D2% (Gy)	38,45	0,46	42,23	2,57	30,47	0,73	.	<0.0001	0.0005
Parotid gland contralateral	5	V27 Gy (%)	36,18	6,62	36,88	5,72	26,86	3,07	.	.	.
		mean dose (Gy)	25,34	3,26	25,62	1,43	21,65	1,00	.	.	0.0248
Parotid gland ipsilateral	5	V27 Gy (%)	52,72	6,63	50,44	4,04	33,13	2,16	.	0.027	0.0008
		mean dose (Gy)	31,96	3,12	32,02	2,00	24,11	0,71	.	0.0178	0.001
Submandibular gland contralat	3	mean dose (Gy)	54,41	1,53	55,91	2,26	50,22	0,07	.	.	.
Oral mucosa	5	V27 Gy (%)	93,16	3,43	86,30	11,26	74,30	7,21	.	0.0226	.
		mean dose (Gy)	40,24	1,03	39,95	3,47	34,92	2,04	.	0.0073	0.0434
Mandible	5	V60 Gy (%)	22,36	6,16	19,42	5,66	21,50	5,13	.	.	.
Middle pharyngeal constrictor	3	V55 Gy (%)	61,17	20,46	29,17	14,79	39,79	16,53	.	.	.
		mean dose (Gy)	58,10	3,72	48,11	6,32	52,61	4,35	.	.	.
Lower pharyngeal constrictor	4	V55 Gy (%)	5,02	1,71	3,85	2,07	5,45	3,57	.	.	.
		mean dose (Gy)	39,30	2,66	38,57	3,37	29,55	4,24	.	.	.
Cricopharyngeal muscle	5	V55 Gy (%)	0,08	0,00	6,64	6,63	0,00	0,00	.	.	.
		mean dose (Gy)	30,06	2,76	42,80	3,00	20,46	2,40	<0.0001	0.0003	<0.0001
Oesophagus (cranial part)	5	V35 Gy (%)	15,36	6,07	76,42	16,11	7,31	2,56	<0.0001	.	<0.0001
		mean dose (Gy)	27,25	2,51	41,19	3,71	18,85	1,66	<0.0001	<0.0001	<0.0001
Supraglottic larynx	5	mean dose (Gy)	45,70	2,21	36,48	3,46	36,00	3,21	0.0018	0.0008	.
Glottic larynx	5	mean dose (Gy)	35,64	1,77	32,98	1,63	24,32	1,44	.	<0.0001	0.0079
lungtop low	5	V20 Gy (%)	21,53	5,52	8,39	2,45	7,45	3,06	0.0049	0.002	.
lungtop high	5	V20 Gy (%)	27,75	6,76	13,11	5,00	10,83	4,42	0.0007	0.0004	.
Brachial plexus low	5	mean dose (Gy)	34,29	2,13	34,13	2,30	30,20	1,40	.	0.0175	.
Brachial plexus high	5	mean dose (Gy)	40,16	1,42	39,99	1,36	34,58	1,01	.	<0.0001	<0.0001
Inner ear low	5	mean dose (Gy)	24,63	2,12	6,88	0,70	12,19	2,04	<0.0001	0.0003	.
Inner ear high	5	mean dose (Gy)	30,82	1,54	9,80	1,41	19,68	1,14	<0.0001	<0.0001	0.0001
Brain - PRV brainstem	5	mean dose (Gy)	7,38	1,05	3,33	0,56	3,83	0,49	<0.0001	0.0006	.
Skin near PTV	5	D2% (Gy)	64,27	2,42	57,53	2,06	63,89	2,70	<0.0001	.	<0.0001
		mean dose (Gy)	42,79	1,20	36,56	1,30	40,19	1,46	<0.0001	<0.0001	<0.0001
Eye low	5	mean dose (Gy)	4,39	0,49	1,88	0,21	1,90	0,25	<0.0001	<0.0001	.
Eye high	5	mean dose (Gy)	6,65	1,35	2,16	0,22	2,19	0,34	0.0029	0.0018	.
Shoulder low	5	D2% (Gy)	10,46	0,40	8,89	1,20	9,41	0,72	.	.	.
Shoulder high	5	D2% (Gy)	12,23	1,30	13,36	3,30	11,24	1,04	.	.	.
Non specified tissue	5	D2% (Gy)	34,73	1,49	37,40	2,17	32,37	2,15	.	.	.
		mean dose (Gy)	10,41	1,37	7,64	1,23	7,49	1,01	0.0002	0.0002	.
Body	5	mean dose (Gy)	19,22	2,20	15,93	2,13	16,00	1,45	0.0005	0.0005	.
(95% of 56 Gy)		V53.2 Gy (cc)	989,39	122,04	972,47	106,41	954,74	116,06	.	.	.
(95% of 69,12 Gy)		V65.7 Gy (cc)	319,89	64,04	271,71	66,44	323,81	72,25	<0.0001	.	<0.0001
Body - PTV	5	mean dose (Gy)	16,18	1,05	13,01	1,75	13,10	1,20	0.0001	0.0028	.

Conclusions: This study shows that it is possible to treat OPC patients with TF as fast as with RA while giving comparable target coverage and sparing of most critical organs. However, with TF the higher dose to the organs at the cranial and caudal end of the target volume and the higher integral dose, both due to the extended cranial-caudal gradient, needs consideration. Moreover, compared to regular HT, both these faster techniques lose a (major) part of HT's OAR sparing capacity.

PO-0674

Understanding the impact of two pharyngeal axis delineation guidelines for planning definition in head & neck IMRT

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Purpose/Objective: Optimisation of swallowing outcome after curative radiotherapy is multifaceted and requires maintaining the functional integrity of multiple pharyngeal axis structures. Recent dose/volume/outcome data (DVO)demonstrates a correlation between laryngeal dose and late dysphagia complication. Accurate and reliable DVO data demands consistent delineation, yet several guidelines for the delineation of the pharyngeal axis exist. This is a comparative study of two delineation guidelines of the pharyngeal axis and the implications that differences between them may have on dosimetry.
Materials and Methods: The pharyngeal axis (inclusive of superior (SPCM), middle (MPCM) and inferior pharyngeal constrictors (IPCM), cricopharyngeus(CP), oesophageal inlet (OI)) were retrospectively contoured by one clinician on five consecutive patients with SCC head and neck, utilising two different sets of delineation guidelines (G1 (1)