lenses, as shown also in the Table. Dose values are smaller (Dmax 16.7%, i.e. around 6 Gy) than those reported in other studies. In our case, the opposed-lateral setup is associated to larger lens doses (56.6%) than those reported using the same technique in another study (26.4%), suggesting that our specific case was a difficult one, presumably age-related.

Dose to the lens (% of prescription dose)

	Delivery mode	Beam arrangement	Dmax	Dmean
First pediatric patient	Active	Lens sparing	16.7%	6.6%
		posterior-oblique	49.4%	34.9%
		opposed-lateral	56.6%	40.4%
Published studies	Passive	posterior-oblique*	68.5%	48.1%
	Passive	posterior-oblique**		40.0%
	Passive	opposed-lateral**		74.0%
	Active	opposed-lateral***	26.4%	

* Gielber et al, Radiat Oncol 2013;8:32 (18 patients).
** Cochran et al, Int J Radiat Oncol Biol Phys 2008;70:1336-42 (39 patients).
*** Lin et al, Int J Radiat Oncol Biol Phys. 2014;90:71-8 (10 patients).

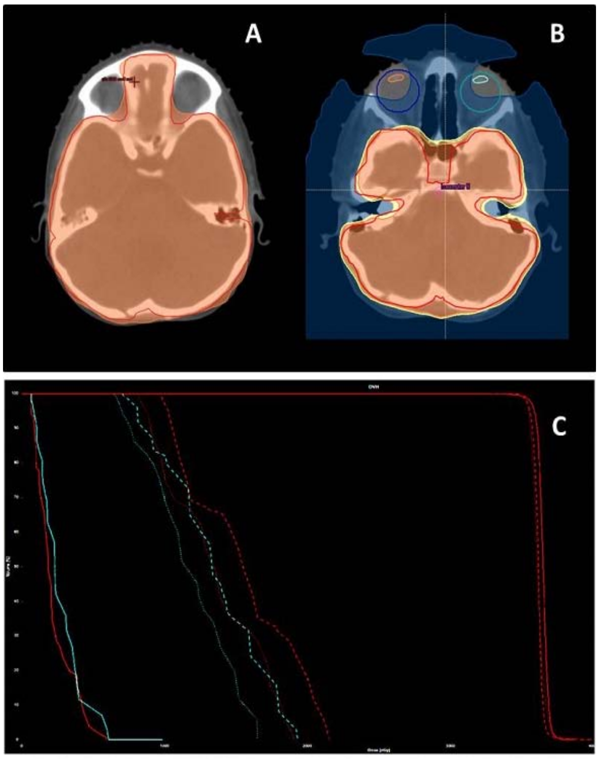

Figure. Dose distribution obtained by the lens-sparing technique at the level of the cribriform plate (A) and of the lens (B). The PTV (red line) and the 98% isodose (orange isofill) are shown. (C) dose volume histogram of the PTV (red), right (orange) and left (cyan) lens. Lens-sparing, posterior-oblique and opposed-lateral distributions are reported by continuous, dotted and dashed lines respectively.

Conclusion: The beam arrangement we applied allowed both an optimal coverage of the cribriform plate and lens sparing. The low maximal dose to the lenses might reduce the risk of radiation-associated cataract.

EP-1692

Dosimetric analysis of testicular doses in prostate radiotherapy at different energy levels

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Purpose or Objective: To evaluate the incidental testicular during prostate radiation therapy with intensity-modulated radiotherapy (IMRT) and volumetric-modulated arc radiotherapy (VMAT) at different energies.

Material and Methods: Dosimetric data of 15 intermediate-risk prostate cancer patients treated with radiotherapy was analyzed. The prescribed dose was 78 Gy in 39 fractions. Dosimetric analysis compared testicular doses generated by 7-field IMRT and VMAT with a single arc at 6, 10, and 15MV energy levels. Doses from the treatment planning system were verified with metal-oxide-semiconductor field-effect transistor detectors. Detectors were placed within a solid, flat phantom at 10 cm depth, from the center of the irradiated field out to 30 cm, with 2 cm distances and 1 cm depth for scattered doses. Values measured from the treatment planning system were compared with values from the detectors.

Results: The mean distance between center of the prostate and the testes was 13.5±1.4 cm (range, 11.6-16.8 cm). For a complete course of 39 fractions, mean testicular doses from the IMRT and VMAT measured in the treatment planning system were 16.3±10.3 cGy vs. 21.5±11.2 cGy (p=0.03) at 6 MV, 13.4±10.4 cGy vs. 17.8±10.7 cGy (p=0.04) at 10 MV, and 10.6±8.5 cGy vs. 14.5±8.6 cGy (p=0.03) at 15 MV, respectively. Mean scattered testicular doses in the phantom measurements were 99.5±17.2 cGy, 118.7±16.4 cGy, and 193.9±14.5 cGy at 6, 10, and 15 MV, respectively, in the IMRT plans. In the VMAT plans, corresponding testicular doses were 90.4±16.3 cGy, 103.6±16.4 cGy, and 139.3±14.6 cGy at 6, 10, and 15 MV, respectively. The scattered testicular doses were significantly higher in the IMRT versus the VMAT plans.

Conclusion: Testicular doses during radiotherapy were high enough potentially to impair the endocrine function of Leydig cells. Higher photon energy and IMRT plans resulted in higher incidental testicular doses compared to lower photon energy and VMAT plans.

EP-1693

Constant dose rate VMAT and step-and-shoot IMRT in head and neck cancer: a comparative plan analysis

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Purpose or Objective: Constant dose rate VMAT (CDR-VMAT) introduces rotational arc radiotherapy for linacs incapable of dose rate variation. The goal of this study was to evaluate CDR-VMAT adequacy for the treatment of head and neck (H&N) cancer compared to Step-and-Shoot IMRT.

Material and Methods: Ten patients (five with oropharyngeal cancer -OPC- and five with hypopharyngeal cancer -HPC-) were enrolled in this study. For each patient, were defined three PTVs: PTV66Gy, PTV60Gy and PTV54Gy with a dose prescription of 66 Gy, 60 Gy and 54 Gy all delivered in 30 fractions. OARs included mandible, spinal cord, brain stem, parotids, salivary glands, esophagus, larynx and thyroid . All patients were previously treated using step and shoot IMRT with seven 6 MV coplanar beams. A protocol for CDR-VMAT plans which consisted of two arcs was established: first arc with start angle was of 182° and a stop angle of 178° in a clockwise direction; the second one in a counterclockwise direction from 178° to 182°; the final arc spacing was set to 4 degree and collimator angle to 45°. For each patient, a CDR- VMAT plan was generated according to this protocol. A dose rate of 300 MU/minute was selected for both IMRT and CDR-VMAT plans. All plans were performed with Pinnacle3 treatment planning system (v 9.8) with identical dose constraints to OARs and dose prescription to targets; it was required that PTVs D95% be 95% of prescribed dose and OARs be spared as more as possible.Dose distributions were compared by evaluating PTVs' Dmean, D2%, D50%, D98% and Homogeneity Index (HI) defined as

$$HI = \frac{D_{2\%} - D_{98\%}}{D_{50\%}}$$