

Parallel-opposed lateral portals, which are routinely used for the irradiation of midline tumors and bilateral neck, almost invariably result in xerostomia. This study analyses whether 3-DCRT and Beam Intensity Modulation (BIM) with dynamic MLC can spare Parotid and Submandibular Glands without compromising the dose distribution in the PTV.

For 15 soft palate / tonsillar fossa (SP/TF) and 15 supraglottic larynx (SGL) tumors, both the primary tumor (70 Gy) and the N0 neck (46 Gy) were treated using parallel opposed beams. For each patient, the residual salivary flow was measured. Separately, all patients were planned conformally using *CadPlan* (Varian-Dosetek) and an in house developed program to optimize the dose distribution in the target using BIM. A two to six field CRT technique was used for SGL or SP/TF, respectively. Results were compared to the conventional parallel opposed technique.

For all patients, the conventional technique results in a minimum dose of 46 Gy in the salivary glands. Consequently, patients developed xerostomia, with remaining salivary flows of less than 10% of the baseline. Using BIM, for the SP/TF and SGL tumors, 25-72% and 43-85%, respectively, of the parotid volume and 0-15% and 3-20%, respectively, of the submandibular volume, receive a dose less than 40 Gy.

For midline tumors in the head and neck region, BIM 3D-CRT permits salivary gland sparing to a substantial and clinically relevant degree. Early and late toxicity, including salivary flow measurements, as well as long term localregional control, are now being evaluated as part of a ongoing comparative study.