FOLLOW-UP OF FORWARD AND INVERSE IMRT FOR PATIENTS WITH HEAD AND NECK TUMOURS

M.C. Lopes1, B.C. Ferreira2, L. Khouri3, J. Mateus1, M. Capela1

1 Serviço de Física Médica, IPOC-FG, EPE, Coimbra, Portugal
2 I3N, Departamento de Física, Universidade de Aveiro, Aveiro, Portugal
3 Serviço de Radioterapia, IPOC-FG, EPE, Coimbra, Portugal

P: A treatment technique based on forward planning IMRT (IFP) was implemented in 2006 for patients with head and neck tumours. Inverse planning IMRT is being delivered since 2008 to selected patients. The incidence of acute and late patient side-effects for these two treatment techniques was compared to the toxicity for the conventional technique (CONVT) using the RTOG scoring system.

M: 34 patients with head and neck tumours treated with CONVT, IFP or IMRT and concomitant chemotherapy were included in the study. IFP was delivered using 5-7 directions and up to 3 segments per incidence. IMRT was delivered using 5-9 directions and no more than 90 segments. Prescription doses for CONVT were 45-54-64.8Gy for the low risk, high risk lymph nodes and primary tumour, respectively. For IFP these were respectively 50.4-59.4-70.2Gy delivered in 1.8Gy fractions. Prescription doses for IMRT varied between 54-59.4-70.2Gy simultaneously delivering two dose levels increasing the dose per fraction to 2.12Gy to one of the PTVs.

R: The worst side-effects were experienced during treatment with maximal toxicity G3: mucositis 11%, pain 11%, dysphagia 8%, odynophagia 8% and radiodermitis 5%. The incidence of other G1-G2 side-effects was: xerostomia 95%, radiodermitis 92%, mucositis 84%, dysphagia 76%, pain 62% and hoarseness 34%. Statistical difference between the toxicity obtained for the different techniques was only obtained for odynophagia G1-G2 (CONVT 90%, IFP 43%, IMRT 36%, p<0.04).

At 6 months after treatment only G1-G2 side effects were observed. 40% of dysphagia with statistical significance was observed for IMRT patients probably due to the higher prescription dose. Without a statistical significant difference G1-G2 complications were for all patients: xerostomia 79%, pain 35%, hoarseness 12%, mucositis 12%, odynophagia 12% and radiodermitis 9%.

With a mean FU of 19 months the incidence of xerostomia was for IMRT 38% (G1), for IFP 79% (G1-G2) and for CONVT 90% (G1-G2), in this case for a mean FU of 45 months (p<0.05). Other complications at this time were: pain (9%) and radiodermitis (6%). All IMRT patients improved from the dysphagia observed at 6 months.

C: The main gain obtained with forward and inverse IMRT compared with the conventional technique for head and neck patients was a twofold reduction in the incidence of odynophagia during treatment and a marked decrease of 10% and 52% in the incidence of late xerostomia for IFP and IMRT, respectively.

Keywords: Head and neck tumours, IMRT, follow-up