

BREAST CARCINOMA: IMPACT OF RESPIRATORY GATING IN CARDIAC DOSE REDUCTION

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Introduction: There is evidence of the importance of dose reduction on the heart due to the association between mean heart dose (Mean HD) and major coronary events in patients who underwent adjuvant radiotherapy for early breast cancer of the left breast (EBCLB). Efforts have been made to reduce the rates of late toxicity and respiratory gating techniques, especially deep inspiration breath hold (DIBH) has shown promising results.

Objectives: Quantify and compare Mean HD and maximum heart dose (Maximum HD) in EBCLB patients using deep inspiration breath-hold (DIBH) vs free breathing (FB). Evaluate the presence of major adverse cardiovascular events (MACE).

Materials & Methods: From 13th Oct' 2016 to 30th Jun' 2018, 14 patients with EBCLB underwent planning CT scans with FB and DIBH, using real-time position management system. Both scans were used for planning and two dosimetries were generated to evaluate Mean HD and Maximum HD for each patient. MACE was evaluated through the observation of hospital records.

Results: 14 women with the median age of 57 years underwent external beam radiation therapy with conventional fractionation (median dose 60Gy), the comparison of DIBH and FB plans showed a reduction on mean HD (3.7 Gy vs 7.1 Gy) and Maximum HD (40.7 Gy vs 49.5 Gy). MACE was evaluated in 10 patients, no MACE was observed; the median follow up was till 16 months.

Discussion: The observed reductions in mean HD and maximum HD can be explained by the displacement of the treated volume relative to the heart. According to published data, the 3.4 Gy reductions in the mean HD represent a reduction in the risk of MACE of 25.2%. MACE events were not recorded in this sample; however a longer follow up is necessary to evaluate the impact of these cardiac dose reductions.

Conclusion: The use of DIBH on EBC has shown a significant reduction on the mean HD and maximum HD. The observed results may contribute to a decrease in the probability of MACE.

Biography

Raul da Silva Colaço is a Medical Doctor and has completed his studies at Nova Medical School Lisbon in 2015. He is currently in his second year of Residency in Radiation Oncology at Instituto Português de Oncologia which began in 2017. Over the past years, he has presented several posters and oral communications in national conferences.

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