SBRT for Central lesions: results of two studies

ESTRO 2023 marked the publication of the results of two studies on the use of stereotactic body radiation therapy (SBRT) to treat central tumours.

The first study was performed retrospectively on patients at a single centre. Patients at Amsterdam University Medical Center (UMC) had been treated for central non-small-cell lung cancer (NSCLC) through the use of volumetric modulated arc therapy delivered in one of two dose regimens: 60Gy / eight fractions or 60Gy /12 fractions. The dose maximum was 110% to 140% of the planning target volume. A total of 127 patients had been included, 80 of whom had been treated with 60Gy in eight fractions. Their median age was 74 years, and 40 of the patients were of World Health Organization (WHO) status 2 to 3. The median lesion size was 4.4cm. The gross target volume was less than 1cm from the trachea or main bronchi in 46% of the cases (group A), or from an intermedius or lobar bronchus in 28% (group B). The median overall survival rate was 25.5 months with a local control at three years of 78%. The rate of severe clinical toxicity was 22% for the whole sample, but increased to 31% in group A. The fatal toxicity rate was 12% for all patients, but 21% in group A compared with 3% in group B. Multivariate analysis showed that the patient's WHO status and the location of the tumours (group A) were predictive of severe toxicity. This study showed good local efficacy at the cost of a risk of major complications in patients with tumours less than 1cm from the trachea or a main bronchus.

The second study was a trial under the European Organisation for the Research and Treatment of Cancer (LungTech 22113-08113). The results were presented by Ursula Neslte. This was a single-arm, multicentre, Phase 2 trial for patients with centrally located NSCLC, who were treated with a single dose of 60Gy in eight fractions. Only 39 patients were recruited of the 150 that the researchers aimed for; of these, the results for 31 patients were analysable. Most patients (90%) had T1a to T2a stage cancer. After treatment, 16% of patients developed local progression, 16% regional progression and 35% a distant progression. At three years, 78.6% of patients showed no local progression. Three patients presented acute toxicity of grade greater than 3, one of whom died, and 11 patients presented late toxicity, one of whom died. After three years, the rate of grade-3 toxicity was 24%.

These two studies show the feasibility of the use of SBRT for central tumours with a satisfactory local control rate but at the cost of late toxicity, notably in the form of significant cardiopulmonary effects.

Sébastien Thureau
Department of Radiotherapy
Centre Henri Becquerel
Rouen, France