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PROGRESSION OF NON-SMALL-CELL LUNG CANCER DURING THE INTERVAL BEFORE STEREOTACTIC BODY RADIOTHERAPY

With the development and establishment of stereotactic body radiotherapy (SBRT), increasing numbers of patients with stage I non-small-cell lung cancer (NSCLC) who are medically inoperable or refuse surgery are now treated with SBRT (1-5). The influence of WT in the treatment of NSCLC on survival remains poorly understood, although many studies focusing on this issue have been performed. The British Thoracic Society recommended a WT of no longer than 4 weeks between acceptance onto a surgeon's waiting list and thoracotomy in operable NCSLC patients (6). However, this recommendation was only derived from analysis of expert committee reports and the clinical experience of respected authorities. Therefore, the length of time that is acceptable for stage I NSCLC has not yet been clarified. To investigate the relationship between waiting time (WT) and disease progression in patients undergoing stereotactic body radiotherapy (SBRT) for lung adenocarcinoma (AD) or squamous cell carcinoma (SQ).

167 patients with stage I AD or SQ undergoing SBRT between January 2004 and September 2009 were analyzed. The WT was defined as the interval between diagnostic CT before referral and CT for treatment planning or positioning before SBRT. Tumor size was measured on the slice of the longest tumor diameter and tumor volume was calculated from the longest diameter and diameter perpendicular to it. Changes in tumor volume and TNM stage progression were evaluated, and volume doubling time (VDT) was estimated.

The median WT was 39 days (range: 5-323 days). There was a correlation between WT and rate of increase in volume in SQ, but not in AD. The median VDTs of AD and SQ were 156 and 97 days, respectively. Thirty tumors (23%) did not show volume increase during WTs > 25 days. In 35 patients waiting for ≤ 4 weeks, no patient showed T-stage progression, whereas in 18 of 95 (19%) patients waiting for > 4 weeks, T-stage progressed from T1 to T2 ($p = 0.003$). In 7 of 89 (7.9%) T1 ADs and 11 of 41 (27%) T1 SQs, T-stage progressed ($p = 0.006$). N-stage and M-stage progressions were not observed.

The WT appears to be more important in SQ than in AD. Generally, a WT of ≤ 4 weeks

appears acceptable.

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