Tomotherapy After Pleurectomy/decortication For Malignant Pleural Mesothelioma Allows The Delivery Of Full Dose Of Radiation In Patients With Intact Lung

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Purpose/Objective(s): To assess the safety and efficacy of Tomotherapy to the intact lung after pleurectomy/decortication (P/D) for malignant pleural mesothelioma.

Materials/Methods: Between June 2009 and October 2010, 22 patients were enrolled in this prospective study and underwent adjuvant or definitive Tomotherapy after P/D (n = 16) or surgical biopsy (n=6) for malignant mesothelioma. The clinical target volume was defined as the entire hemithorax, including chest wall incisions and drain sites, and excluding the intact lung. The dose prescribed to the planning target volume was 50 Gy delivered in 25 fractions. All patients underwent FDG-PET for staging after surgery. Any FDG-avid areas or regions of particular concern for residual disease were given a simultaneous boost of radiotherapy to 60 Gy. Twenty-one patients received pre-operative and/or post-operative platinum-based chemotherapy; radiation was delivered after completion of chemotherapy. Toxicity was graded using the modified Common Toxicity Criteria v3.0. Lung dosimetric parameters were reported. Local control and survival were assessed.

Results: The median follow-up after radiation completion was 8 months. Of the 22 patients, 1 (4.5%) developed Grade 2 acute pulmonary toxicity one month after the end of radiation; symptoms were resolved with steroids and antibiotics. One patient developed acute Grade 3 thrombocitopenia during radiation therapy. No patient died of toxicity the median dosimetric parameters were a total mean lung dose (MLD) of 20 Gy (range, 16Gy-26Gy), a percentage of total lung volume receiving 20 Gy (V20) of 37% (range 29%-47%), and a total lung V5 of 52% (range 42%-84%). The median intact lung MLD was 45 Gy (range, 43Gy-48Gy), and the median intact lung V20 was 96% (range, 93%-100%). The patient who developed Grade 2 pneumonitis had a total MLD of 26 Gy, a total lung V20 of 47%, a total lung V5 of 84%, an intact lung MLD of 45 Gy, and an intact lung V20 of 93%. Local and/or distant failure occurred in 5 patients (22%). Eighteen patients (78%) were alive without evidence of recurrence at last follow-up.

Conclusions: Tomotherapy allows the safe delivery of high dose of radiation to the hemithorax of malignant pleural mesothelioma patients with intact lung. Local-regional control and survival results will be reported.