Concurrent Chemoradiotherapy with or without Surgery using Helical Tomotherapy or Intensity-modulated Radiotherapy for Esophageal cancer patients

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Objectives: To retrospectively review the treatment outcome of esophageal cancer in our hospital, and compare the radiotherapy efficacy and toxicity of helical tomotherapy with step-and-shoot Intensity Modulation Radiation Therapy (IMRT).

Methods: Between 2007 and 2012, 108 consecutive patients with locally advanced esophageal cancer, cT2-4N0-3M0-1, received neoadjuvant concurrent chemoradiotherapy (CCRT) followed by esophagectomy or definitive CCRT treatment course respectively. The radiotherapy was delivered with helical tomotherapy in 56 patients, and with conventional IMRT in other 52 patients. We had evaluated outcomes with radiation dose, overall survival rate (OS), disease-free survival rate (DFS), and toxicity of radiation pneumonitis.

Results: The median follow-up duration was 16 months. The median time of overall survival among all patients was 15 months. The treatment modality with neoadjuvant CCRT followed by esophagectomy had favorable OS (47.6% : 10.4%, p = 0.014), DFS (42.9% : 23.9%, p = 0.013), and local recurrence (33.3% : 50.7%, p = 0.574) comparing with definitive CCRT. No significant difference outcome of OS was found between tomotherapy and conventional IMRT. The patients using tomotherapy had less incidence and severity of radiation pneumonitis (only one patient with less than grade 3 radiation pneumonitis in tomotherapy group; 5 patients < grade 3 and 2 patients > grade 3 radiation pneumonitis in conventional IMRT group).

Conclusions: In our study, the treatment outcomes of neoadjuvant CCRT followed by esophagectomy for esophageal cancer are better in OS, DFS, and local control than definitive CCRT. Tomotherapy may reduce lung dose, and probably reduce incidence and severity of radiation pneumonitis when compared with conventional IMRT.

References: