

**Purpose:**

Lung Cancer represents the major reason for mortality in the modern society. The disease is usually diagnosed in the advanced stage. External beam radiation therapy is the essential component in the treatment of stage 3 Non Small Cell and Small Cell Lung cancer patients. IMRT proved as preferred technique above conformal 3 D in term of sparing lung tissue and subsequent radiation pneumonitis. In our work we investigated the impact of innovative technique of combination of 3 D and IMRT on dose distribution in centrally located lung cancer patients. The rationale of combination is based on the inability of IMRT technique to provide the oppositional fields arrangement desired in order to avoid the additional lung tissue

**Methods:**

Three treatment plans were generated for seven patients with lung cancer. For every patient 3 D conformal, IMRT and combined 3D and IMRT plans were compared for V5, V10, V20, V 30 and mean dose of the lung DVH, maximal dose to the esophagus and spinal cord

**Results:**

The DVH of the lung in three comparative plans for 3D, IMRT and combined plans for the total lung -GTV was as follow: V5-  $63.2 \pm 8.6\%$ ,  $63.9 \pm 9.2\%$ ,  $56.6 \pm 11.4\%$ ; V10-  $53.07 \pm 10.1$ ,  $52.3 \pm 11.2$ ,  $38.8 \pm 9.6$ ; V20-  $27.6 \pm 6.7$ ,  $31.1 \pm 7.0$ ,  $20.6 \pm 2.3$ ; V30-  $14.3 \pm 4.6$ ,  $13.36 \pm 0.37$ ,  $14.96 \pm 1.22$  respectively. The maximal doses to esophagus was  $53.21 \pm 3.05$ ,  $54.4 \pm 4.67$ ,  $52.3 \pm 4.5$  Gy respectively. Maximal dose to the spinal cord was  $42.5 \pm 2.9$ ,  $39.58 \pm 1.2$  and  $43.7 \pm 4.5$  Gy respectively

**Conclusions:**

Combined 3 D and IMRT technique results in better lung tissue sparing comparing to other treatment plans