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The Role of Radiation Therapy on Medically Inoperable Clinically Localized Non-small Cell Lung Patients: London Regional Cancer Program (LRCP) Clinical Experience

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INTRODUCTION

• Lung cancer is the most frequent cause of cancer death in both men and women in North America. In 2006, an estimated 22,700 Canadians will be diagnosed with lung cancer and 19,500 will die of it (Canadian Cancer Statistics 2006).

• Approximately 15-25% of NSCLC patients present with early or localized disease.

• Surgical resection of T1-3, N0, NSCLC remains the treatment of choice for this population, and results in a 5-year survival rate of 50-70%.

• Patients with medically inoperable disease have been treated with non-surgical therapies, such as radiation therapy (RT), while some patients have simply been observed without any tumor therapy because of their co-morbid illnesses.

• Potential confounding issues in this patient population include some patients who are not referred to our Centre due to co-morbid disease, and some who are referred, but are not offered radical RT due to poor outcome expectations. In addition, patients may refuse treatment when offered.

• We have reviewed the past 19 years’ experience at LRCP in management of this group of patients.

METHODS

• Patients treated at LRCP from 1985-2004 with pathological diagnosis of Non Small Cell Lung Cancer (NSCLC), and clinically staged without nodal or distant organ involvement, were reviewed.

• In general, these patients with medically inoperable disease were referred to us by thoracic surgeons and respirologists.

• Patients who previously received chest RT, had clinically positive nodes, or with distal disease, were excluded.

• We have reviewed the past 19 years’ experience at LRCP in management of this group of patients.

RESULTS

• From January 1985 to January 2004 there were 76 patients meeting the selection criteria, including 70% male and 30% female. The median age of the study group was 70 years old (range from 38 to 92 years old).

• There were 30% Adenocarcinoma, 53% Squamous cell carcinoma and 17% Large cell carcinoma (Table 1).

• Clinical stages were T1 (28%), T2 (54%) and T3 (18%). Median follow up was 17.6 months (range from 0.4 to 123 months). At the time of analysis 72% (96 of the patients were dead and 40% were alive.

• Seventy eight percent of the patients completed radical RT while 22% declined RT. There were 80% patients treated with combined CRT (bulky >6cm and/or adhered to major vessels). For patients who completed RT and 2-year disease-free survival (DFS) rates were 36.1%, and 11.4%; overall survival (OS) rates were 33.3% and 4.9%, respectively. The median DFS and OS rates for T1, T2, and T3 were 18.7, 15.2, and 10.0 months, respectively.

• Patients who received CRT compared to RT had median survival (CSS) rates of 21 months and 4.9 months (P=0.001) (Figure 3); OS rates of 20 months and 5 months (P=0.018) (Figure 2), respectively.

• Patients treated with RT increasing tumor sizes worsened cancer control and survival (Figure 3). Tumor size of ≤ 6cm had an 18.7 month median DFS rate with RT, compared to those who had >6 cm and had 11 months (P=0.017).

• For patients receiving CRT the median CSS rate of 15.2 months compared to those of 20 months with RT only (P=0.739) (Figure 4).

• Univariate and multivariate analyses showed radiation treatment and tumor size have influence on patients survival (Table 2).

• Overall survival and time to recurrence was assessed using hazard ratios. Predictors of survival were estimated using Cox proportional hazards regression.

• The role of combined CRT in bulky localized medically inoperable NSCLC patients management needs further investigations.

CONCLUSION

• Radical RT improves survival in patients with localized medically inoperable NSCLC. Observation – only has inferiority for this group of patients and may not be an optimal treatment option.

• There is interaction between RT and tumor size with poor cancer control and patient outcome for tumors with larger size.

• Further clinical trials with conformal treatment and respiratory gating technologies to minimize potential treatment morbidities are on going, including in house conformal IMRT/Brachytherapy and without gating RT, national and international clinical trials (NCIC Br-25, RTOG 0236).

• The role of combined CRT in bulky localized medically inoperable NSCLC patients management needs further investigations.