

Ian J. Gerard¹, Neelabh Rastogi¹, Jayson Paragas¹, Tanner Connell², Bassam Abdulkarim¹, Marie Duclos¹, Sergio Faria¹, Neil Kopek¹

¹Division of Radiation Oncology, McGill University, Montreal, Quebec, Canada
²Medical Physics Unit, McGill University Health Centre, Montreal, Quebec, Canada

Introduction and Purpose

- The standard of care for unresectable stage III non-small cell lung cancer (NSCLC) patients not candidates for concurrent chemotherapy (CT) and radiotherapy (RT) is not well established.
- Hypofractionated RT (hRT) can be used after CT induction, or, as a bridge to sequential CT to offer a curative intent treatment regimen. Tumour and nodal proximity to mediastinal structures plays an important role regarding the degree of safe hypofractionation.
- There is limited published evidence related the benefits of hRT combined with induction or sequential CT among this group of patients. We analyzed the outcomes of stage III NSCLC receiving a hRT regimen of 52.5 Gy in 15 fractions alone, or with either induction or sequential CT.

Materials and Methods

- In this retrospective review, patients with stage III NSCLC receiving hRT 52.5 Gy in 15 fractions between 2008-2020 were included for analysis.
- Patients were separated into three cohorts: i) hRT alone, ii) induction CT followed by hRT, and iii) hRT followed by sequential CT.
- Overall survival (OS) and radiation toxicity (CTCAE v5.0) were analyzed for all 3 cohorts. Patients for whom sequential chemotherapy was planned, but not delivered, were included in cohort ii) through intention-to-treat analysis.
- The OS at 2 years was statistically evaluated using a log-rank test with alpha set at 0.05.

Results

- 83 patients met criteria for analysis with 35, 30, and 18 patients respectively in cohorts i), ii), and iii).
- Median age at treatment was 75 (43-91) with 53% of patients being men and 43% women.
- Tumour histology varied between adenocarcinoma (43%), squamous cell carcinoma (44%), and others (13%).
- The median/2-year OS for cohorts i), ii), and iii) was 8 mo/19%, 25 mo/50%, and 17 mo/72% respectively.
- OS between any chemotherapy and no chemotherapy was statistically significant (p = 6.1x10⁻⁷) while the timing of chemotherapy did not reach statistical significance (p = 0.15).
- RT was overall well tolerated with grade 1-2 fatigue being the most common side effect (81%), 1 patient had grade 3 pneumonitis, and 1 patient had a rib fracture.

Conclusions and Future Work

- Among patients with stage III NSCLCs, moderately hRT of 52.5 Gy in 15 fractions, with either induction or sequential CT appears to provide a survival advantage compared to hRT alone, with an acceptable side-effect profile.
- The 2-year OS reported here is similar to other published hRT regimens (SOCCAR trial) and conventional fractionation (RTOG0617). Conclusions are limited by the retrospective nature of the study, and the introduction of immunotherapy (IO) for stage III NSCLC in 2019 in Canada.
- Future work will focus on evaluating dosimetry, the impact of IO, and, patients not included in this analysis that also received this regimen (oligometastasis, locoregional failure, other stages).

