COMPLETION RATE AND TOXICITY OF HYPO-FRACTIONATED RADIOTHERAPY FOR RETROPERITONEAL AND PELVIC SOFT TISSUE SARCOMAS

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Background: Retroperitoneal and pelvic soft tissue sarcomas are difficult tumors to resect with wide margins, thus incurring a high risk of local recurrence. Treatment frequently includes neoadjuvant radiation (RT) to improve local control. Standard neoadjuvant RT typically takes 5-6 weeks to complete. Hypo-fractionated RT may be an appealing alternative in that it allows patients to complete their course of treatment in a shorter amount of time, with potentially fewer unintended interruptions. This study examines patients receiving standard or hypo-fractionated RT for local control of these sites. We report completion of treatment, toxicity and surgical margins.

Methods: An IRB approved, review was undertaken of a prospectively collected database initiated 11/2017. From the 199 patients with histologically confirmed sarcomas collected at our institution patients not having had neoadjuvant RT, non-retroperitoneal or pelvic sites, or missing data were excluded from analysis. Thus, 26 patients remained who were treated with RT to a primary or recurrent tumor of the retroperitoneum/pelvis for local control with or without intended surgical resection. Patients with standard palliative radiotherapy courses not planned for surgical resection were excluded. Patients treated to standard doses of 44-57.5 Gy given in 22-28 fractions were defined as a standard RT cohort. Patients treated to hypo-fractionated course ranged from 20-39 Gy given in 5-13 fractions. The primary endpoint of the study was acute toxicity (CTCAE v 4.03, $\leq$ 90 days from RT). Treatment tolerability and surgical margins were evaluated as well. Toxicity records and surgical margins were obtained from patient notes and surgical pathology respectively.

Results: Overall median age was 58.3 years (range 42-80). Ten of the 26 patients had disease involving the pelvis, while the remaining 16 had retroperitoneum disease. The most common histology was leiomyosarcoma (35%), and median tumor size was 12.6 cm (range 2.2- 27). Seven (27%) patients received hypo-fractionated RT and 19 (73%) received standard RT. All standard RT patients successfully completed their course without any interruptions. One of the 7 hypo-fractionated RT patients did not complete the course as the patient opted to go to hospice prior to RT completion. Twenty (77%) of the 26 patients had surgery after RT as intended; 2 in the hypo-fractionated RT group and 18 in the standard RT group. Surgical margins were positive in 1 of 2 patients in the hypo-fractionated RT group, while 22.2% (4 of 18) in the standard RT group had positive margins. No patients experienced $\geq$ grade 3 toxicity. Within the hypo-fractionated RT group, 14.29% of patients experienced grade 2 toxicity of any kind, while 31.58% of standard RT patients experienced grade 2 toxicity of any kind; $p = 0.7261$. Analysis of GI toxicities (upper and lower) showed 14.29% of hypo-fractionated patients experienced GI toxicity (grade $\geq$1), while 47.37% of standard RT patients experienced GI toxicity (grade $\geq$1); $p = 0.1904$.

Conclusion: Our institutional review shows that both hypo-fractionated and standard RT was well tolerated with no grade 3 or higher toxicities in either group. In our limited series, hypo-fractionated RT was well tolerated, additionally those patients intended for curative surgical resection completed resection as originally intended. The hypo-fractionated cohort of patients incurred less toxicities compared to standard RT, however this was not statistically significant. Study limitations include the small size and limited follow-up, further research is needed to clarify the potential equivalence of hypo-fractionated RT relative to standard RT in the setting of retroperitoneal/pelvic sarcomas.