POSTER 11

Surgical outcomes in patients treated with 5-day preoperative radiotherapy for primary soft tissue sarcoma

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Background: Standard of care treatment for high-risk soft tissues sarcoma (STS) of the extremity/trunk includes radiation therapy (RT) and surgical resection. At our center, initial results of a phase II single arm trial of 5-day preoperative RT overall demonstrated safety and local control comparable to conventional 5-week preoperative RT. However, a more granular assessment of surgical outcomes and complications is warranted.

Questions/Purposes: What are the detailed surgical outcomes and perioperative complications in patients undergoing 5-day preoperative RT (30 Gy) followed by surgical resection for high-risk STS of the extremity/trunk?

Methods: Patients meeting inclusion and exclusion criteria were consented and enrolled on an ongoing IRB-approved prospective phase II trial and received preoperative hypofractionated RT (30 Gy over 5 consecutive daily fractions) followed by surgical resection by one of 4 dedicated sarcoma surgeons within an average of 4 weeks (range 1-213 days). A secure prospective patient database was generated using UCLA Research Electronic Data Capture (REDCap). Data extracted included demographic variables, tumor variables, and surgical outcome data. Demographic variables included age, sex, diabetes, and smoking status. Tumor variables included: histology, location, and size. Surgical variables included type of wound closure, estimated blood loss (EBL), drain usage and duration. Surgical outcomes included rate of limb salvage, bony complications, soft tissue complications after primary surgery (dermatitis, superficial infection, deep infection, drainage, and presence of seroma), margin status and rate and type of re-operation. Patients included had a minimum post-operative follow-up of 100 days. Demographic data was presented with descriptive statistics, with mean and standard deviation (SD) or median and interquartile range (IQR) depending on the data distribution. Dichotomous variables were compared using the Fischer's exact test.

Results: A total of 86 patients were included in the analysis with a mean age of 58.4 (SD 16.9): 37 (43%) were female, 10 (11.6%) were diabetic and 8 patients (9.3%) were active smokers or had a >10 pack-year smoking history. Median follow up was 24.6 months (IQR 11.4-44.6). The most common histologic diagnosis was undifferentiated pleomorphic sarcoma (39.8%), followed by myxoid liposarcoma (19.4%), 'other' STS (15.1%) and myxofibrosarcoma (10.8%). The most common location was the lower extremity (58.1%), followed by the upper extremity (20.9%), trunk (10.5%), pelvis (8.1%), or 'other' (2.3%). Primary wound closure was achieved in 85 patients (98.8%); one patient required a split-thickness skin graft. Twenty-six (30.2%) cases required local tissue advancement for primary closure. After primary resection, gross residual disease (R2) was present in 2 patients (2.3%), positive microscopic margins (R1) in 14 patients (16.3%), and negative margins (R0) were achieved in 70 (81.4%) of patients. Twenty-six (27.9%) patients experienced surgical wound complications. Median EBL was 50mL (IQR 25-100). Wound dehiscence occurred in 18 patients (20.9%) at a median duration of 43.5 days (IQR 40.3-85.3) from surgery. Bony complications occurred in 4 patients (2 female, average age of 69) including 3 pathologic fractures, and 1 episode of osteonecrosis requiring surgical intervention. Overall rate of limb salvage in this cohort was 96.5%, with 3/86 patients undergoing secondary amputation for disease progression at an average of 173.3 days (range: 140-230) from the primary surgery. Secondary surgical intervention was required in 31.4% of patients (27/86), of which 15 were irrigation and debridement and 7 were re-excisions. Patients requiring local soft tissue advancement for closure were more likely to experience a soft tissue complication (46.2% vs. 23.3%, $p = 0.04$). Soft tissue complications and re-operations were

not worse in patients having surgery ≤2 weeks after RT versus patients having surgery >2 weeks after RT (30.8% vs. 30.1% p = 0.9 and 30.8% vs. 31.5%, p = 0.9, respectively).

Conclusions: Even upon a more granular analysis, perioperative soft tissue and bony complications for patients with primary STS undergoing surgical resection following 5-day preoperative RT remain low and comparable to conventional 5-week preoperative RT, with a high rate (96%) of limb salvage. Soft tissue complications were higher among patients requiring local soft tissue advancement for wound closure.