Neoadjuvant Radiotherapy For Myxoid Liposarcomas: Oncologic Outcomes And Histopathologic Correlations

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Introduction: Liposarcoma (LPS) is the most common soft tissue sarcoma of the extremities in adults. The purpose of our study was to evaluate the histopathological features of primary extremity myxoid LPS before and after neoadjuvant radiation therapy in relation to oncological outcome of patients.

Patients and Methods: Retrospective review of 124 liposarcoma patients, who were registered to our orthopedic oncology database between January 1998 and December 2015, yielded 27 patients with primary myxoid liposarcoma located in the extremities. Inclusion criteria were having histopathological confirmation of both the initial biopsy and the resection specimen, and having received neoadjuvant radiotherapy. Demographic, clinical and histopathological data were evaluated.

Results: Over a mean follow-up period of 60.5 (2-162) months, 6 patients (22.2%) died secondary to disease progression, leaving 21 patients (77.8%) alive at the time of last follow-up. Only one patient (4%) experienced local recurrence and seven (26%) patients developed distant metastases. Disease-free survival at 5 and 10 years were 69% whereas overall patient survival at 5 and 10 years were 78.2% and 72.6% respectively. Tumor size (>15 cm) and presence of metastases were significantly associated with increased risk of overall mortality.

Histopathology after definitive surgery revealed that tumor necrosis was present in 13 out of 27 patients. Hyalinization/fibrosis was present in all 27 patients while 17 (63%) cases demonstrated 50% or greater hyalinization/fibrosis. The number of specimens, which had round cell component, was significantly lower in the excision group compared to the initial biopsy group (P:0.003). Residual viable tumor cells were present in all tumors. Three patients showed extensive (90 %) hyalinization with 0–10 % residual tumor. Adipocytic maturation / cytodifferentiation was seen on histopathology in 10 out of 27 patients.

Conclusions: The effectiveness of neoadjuvant radiotherapy for myxoid liposarcomas can be demonstrated histopathologically by quantitative analysis of round cells, necrosis, hyalinization, viable tumor cells and adipocytic maturation. Two possible mechanisms by which radiotherapy contributes to tumor control are inhibition of myxoid stroma production by tumor cells and causing direct vascular damage. However, these histopathological parameters did not affect the patients' oncological outcomes. Favorable oncologic outcomes were obtained in this patient series with the combination of neoadjuvant radiotherapy± chemotherapy and surgery.

Keywords : neoadjuvant radiotherapy, myxoid liposarcoma, round cell, hyalinization, fibrosis
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