

## Preoperative versus Postoperative Radiation Therapy in Patients with Soft Tissue Sarcoma of the Extremity

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**Abstract :** Background: Soft tissue sarcomas (STS) are generally treated with a combination of limb preservation surgery and radiation therapy. Today, preoperative radiation therapy is considered for accurate treatment volume and smaller field size. Therefore, this study was performed to compare preoperative with postoperative radiation therapy in patients with extremity STS. Methods: In this non-randomized clinical trial, patients with localized extremity STS referred to the orthopedic clinics in Iran from 2021 to 2023 were studied. Patients were randomly divided into two groups: preoperative and postoperative radiation therapy. The two groups of patients were compared in terms of acute (wound dehiscence and infection) and late (limb edema, subcutaneous fibrosis, and joint stiffness) complications and their severity, as well as local recurrence and other one-year outcomes. Results: A total of 80 patients with localized extremity STS were evaluated in two treatment groups. The groups were matched in terms of age, sex, history of diabetes mellitus, hypertension, smoking, involved side, involved extremity, lesion location, and tumor histopathology. The acute complications of treatment in the two groups of patients did not differ significantly ( $P > 0.05$ ). Of the late complications, only joint stiffness between the two groups had significant statistical differences ( $P < 0.001$ ). The severity of all three late complications in the postoperative radiation therapy group was significantly higher ( $P < 0.05$ ). There was no significant difference between the two groups in terms of the rate of local recurrence of other one-year outcomes ( $P > 0.05$ ). Conclusion: This study showed that in patients with localized extremity STS, the two therapeutic approaches of adjuvant and neoadjuvant radiation therapy did not differ significantly in terms of local recurrence and distant metastasis during the one-year follow-up period and due to fewer late complications in preoperative radiotherapy group, this treatment approach can be a better choice than postoperative radiation therapy.

**Keywords :** soft tissue sarcoma, extremity, preoperative radiation therapy, postoperative radiation therapy

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