

## Hypofractionated Preoperative Radiotherapy in Patients with Primary or Recurrent Osteosarcoma: A Retrospective Cohort Study

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### ABSTRACT

#### OBJECTIVES

Preoperative radiotherapy has been used with high-grade bulky tumors or tumors close to neurovascular structures in patients with osteosarcoma. Hypofractionated radiotherapy protocols have been recently preferred upon understanding its similar efficacy and non-increased adverse effects. We aimed to evaluate the impact of preoperative hypofractionated radiotherapy in patients with primary or recurrent osteogenic osteosarcoma.

#### METHODS

A single-center, retrospective study was performed on patients with primary or recurrent osteogenic osteosarcoma who underwent preoperative hypofractionated radiotherapy between 2014 and 2020. The patients preoperatively received a total dose of 30 Gy to 35 Gy with ten fractions. The demographic and clinical characteristics of the patients were recorded. The patients were grouped as good (necrosis rate of  $\geq 90\%$ ) and poor responders (necrosis rate of  $< 90\%$ ). Survival rates, including recurrence-free, metastasis-free, and overall, were calculated.

#### RESULTS

There were 20 patients with a median age of 17 years. Negative surgical borders were obtained in 88.9% of 18 patients amenable to limb-sparing surgery after preoperative radiotherapy. The median percentage of necrosis was 88.5%, ranging from 30% to 100%. Half of the patients (50.0%) were good responders. There were two local recurrences (10.0%) and nine metastasis (45.0%). The lungs were the most common for metastasis (40%). The overall mortality and five-year survival rates were 40.0% and 45.0%. The median recurrence-free, metastasis-free, and overall survival were 49.4, 34.4, and 56.1, respectively.

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## **CONCLUSION**

Preoperative hypofractionated radiotherapy with or without chemotherapy might be a treatment modality in osteosarcoma patients for limb-conserving or that are resectable but hard to achieve clean margins due to local involvement.

## **KEYWORDS**

Osteosarcoma; Radiotherapy; Preoperative period; Survival analysis

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