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## The Impact Of Methotrexate and Tumor Necrosis On The Outcome Of Patients With Osteosarcoma.

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### Background:

Osteosarcoma (OS) is the most common non-hematologic primary malignant bone tumor. There are conflicting reports about the role of Methotrexate in the treatment and the role of histologic tumor necrosis as a predictor of survival.

We aim to show the benefit of Methotrexate in pediatric protocols, and the significance of tumor necrosis in predicting patient's survival.

### Methods:

Retrospective Chart review of all patients diagnosed with osteosarcoma from Jan 2003 to Dec 2009. Multiagent chemotherapy is used in all patients, while methotrexate is used only for pediatric patients. Results: Fifty-six patients with osteosarcoma were treated at our center during the study period. The median age of patients was 17.2 years (range, 6 to 51 years). A majority of the pediatric group (68%) and approximately half of the adult group (52%) received neoadjuvant chemotherapy as part of their therapy. One-fifth of tumors demonstrated greater than 90% necrosis with chemotherapy. Most resections (n=42, 75%) yielded adequate margins in both groups while the margins were involved in 3 patients and close in 11 patients. In the first 4 years, 29% of the patients with extremity tumors underwent LSS; while in the last period, 79% underwent LSS (chi-square test for trend, P=0.0001). For non-metastatic patients with extremity tumors, the 3-year EFS for children and adults were 67% ± 16% and 64% ± 20% (P=0.92), and for metastatic patients with extremity tumors, the 3-year EFS for children and adults were 32% ± 13% and 57% ± 16% (P=0.99). Necrosis (>90%) was a favorable prognostic feature with no events occurring in patients with good response (P=0.079). The 3-year EFS for patients with necrosis >70% was 83% ± 11% vs. 37% ± 10% (P=0.01).

### Conclusion:

Children did not have better outcome despite the addition of methotrexate. We found a marginal survival advantage at 90% necrosis; however, our study suggests that necrosis rates above 70% after neoadjuvant chemotherapy may be sufficient to indicate significantly better outcome.

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