

**Limb salvage versus amputation in patients with osteosarcoma of the extremities: an update in the modern era using the National Cancer Database, Evans D. et al., *BMC Cancer*, 2020**

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**Level of Evidence:** 2

**Reviewer:** Zaria St Lawrence, MS-III  
*Barry University School of Podiatric Medicine*

Since the National Institute of Health deemed limb salvage equivalent to amputation in treating osteosarcoma in 1984, limb salvage has started to replace amputation in terms of treatments. Using the National Cancer Database, a comparison was made of the populations that have received amputations rather than limb salvage, as well as examining the survival rates of patients receiving either an amputation or limb salvage surgery for patients that had osteosarcoma. Evans et al. performed a retrospective study examining all osteosarcoma cases within National Cancer Database from 2004 to 2015. The inclusion criteria included:

- Patients that have undergone surgical resection or amputation as treatment for osteosarcoma
- Osteosarcoma was the patient's primary cancer
- The osteosarcoma was found within the extremities
- The histological grade of the tumor was either a three or greater

Any cases that were missing the treatment date or that were not complete were excluded from the study. 1,855 patients qualified to be within the limb salvage surgery/radical resection, while there were 587 patients within the amputation cohort. Demographic factors for this study are age, sex, race, zip code, zip code income quartile, zip code educational quartile, insurance status, year of diagnosis, and the distance in miles from the hospital. To control for ages, within the limb salvage and amputation groups, the ages were divided into below 18, 18-40, and 40+ years old. To control for the demographic and clinicopathological characteristics, a T-test for continuous variables and chi-squared tests were used for categorical variables. The research team used the Kaplan Meir Curve to calculate the unadjusted overall survival. In addition, Evan et al. used a multivariate Cox proportional hazard model to determine which variables had been independent to the patient's survival.

Once confounding variables were controlled, it was found that limb salvage provided a better overall survival rate than the usage of amputation; however, there is a note that it is difficult to infer what is the causative agents between the survival rates. The study also re-establishes that completing chemotherapy and having negative surgical margins in treating osteosarcoma is vital.

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