

Amputation(Amp) in Pediatric Lower Extremity(LE) Bone Sarcoma Survivors: Predictors of Function(Fxn) and Quality-of-Life(QOL)

Rajaram Nagarajan, MD, MS³, Denis R Clohisy, MD², Joseph P Neglia, MD, MPH¹, Charles Sklar, MD⁴ and Leslie L Robison, Ph.D.³.

Affiliations: ¹ Ped Heme/Onc/BMT, Univ of MN, Mpls, MN, United States; ² Orthopedics, Univ of MN, Mpls, MN, United States; ³ Ped Epidemiology and Clinical Research, Univ of MN, Mpls, MN, United States and ⁴ Peds, MSKCC, NY, NY, United States.

Background: Amp had been the standard of care prior to wide use of limb sparing surgeries(LSS) based on the premise of improved Fxn and QOL. However, the improvement in QOL and Fxn has not been proven equivocally and needs to be balanced against the complications and durability of LSS.

Objective: To find determinants of poor QOL and Fxn in survivors of pediatric LE bone tumors who had an Amp.

Design/Methods: Utilizing standardized and validated measures, we evaluated limb Fxn using the Toronto Extremity Salvage Score(TESS) and QOL using the City of Hope's Quality of Life-Cancer Survivor(QOL-CS) in 359 patients who underwent an Amp for a LE bone sarcoma. Subjects were from the Childhood Cancer Survivor Study and had survived more than five years following a diagnosis of osteosarcoma (n=337) or Ewing's sarcoma (n=22).

Results: There were 174 females and 185 male survivors with an Amp who were diagnosed and between 1970-1986, with a median age of 14(3-20) years at diagnosis and a median age of 31(18-49) years at evaluation. Amps included: above the knee Amp(AKA, n=252), hip disarticulation(HipD, n=50), below the knee Amp(n=19), hemipelvectomy(n=11), knee disarticulation(n=4), rotationplasty(n=6) and not otherwise specified(n=17). Overall 29% describe themselves as disabled and 25% scored below the 25th percentile for QOL and Fxn. Predictors of disability were the level of Amp, with AKA faring better then HipD (p= 0.03) and older current age (p= 0.03). Level of Amp was not predictive of QOL-CS (p= 0.19) or TESS score (p=0.45). Predictors for scoring below the 25th percentile for Fxn included female gender (p= 0.04), older age at diagnosis (p= 0.01) and older current age (p= 0.03). Predictor for scoring below the 25th percentile for QOL was older current age (p= 0.01).

Conclusions: Overall LE amputees had a relatively high score of Fxn and QOL with a low incidence of reporting being disabled. However, female gender and older age at diagnosis and assessment predicted poor outcome and identified subgroups where interventions may be warranted. It is important to continue to follow this cohort, to determine effects of Amp following bone sarcoma and to serve as a comparison to today's LSS.