

**Number & Title: 11298: Prospective non randomized study which correlates the size and marrow extent of bone sarcomas as determined by MRI with that of final histopathology report.**

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**Background:** Presently, for bone sarcomas, limb-salvage surgery have become the procedure of choice and standard of care in appropriate patients owing to the improvements in imaging and chemotherapy. For any limb salvage procedure, preoperative accurate measurement of the extent of tumor is mandatory so that limb salvage can be done with preserving adequate limb function while not compromising oncological outcome. MRI is the investigation of choice to detect malignant bone marrow involvement.

**Purposes:** To find out how well MRI correlates with histopathology in assessing extent of bone sarcomas and, hence accurately determining the osteotomy plane during limb salvage procedures.

**Method:** This study is a prospective non randomized study, involving 100 consecutive patients with a diagnosis of bone sarcoma who presented to bone and soft tissue disease management group over 6 months. Tumor extent in prechemotherapy and post chemotherapy MRI is evaluated by radiologist and the investigator and recorded. For assessing the intramedullary extent, a T1 weighted image is used. Resected specimen is bisected longitudinally and extent of tumor is noted. For study purpose, only the longitudinal (craniocaudal) intramedullary and extramedullary extent is recorded and analysed.

**Results:** A total of 100 cases were included in the study--73 osteosarcomas, 20 Ewings and 7 chondrosarcomas. Proximal tibia and distal femur were the most common sites involved. 82% of osteosarcomas and 80 % of Ewings sarcomas had more marrow disease than soft tissue disease. In 79 cases where the size in MRI was more than specimen size, mean difference was 1.9 cm with a standard deviation of 1.5. In cases where marrow extent was more than extramedullary, mean difference was 1.8 cm with a SD of 1.5, and in cases where extramedullary dimension was more, these were 2.4 cm and 1.2, respectively. In the 14 cases where specimen size was more than MRI, mean difference was 0.54 with a standard deviation of 0.44. In cases where marrow extent was more than extramedullary, mean difference in size was 0.43 cm with a SD of 0.4 cm. In cases where extramedullary extent was larger, mean difference was 0.93 cm with a SD of 0.4. Pre chemo and post chemo MRI significantly correlates with HPR with respect to intramedullary and extramedullary extent of tumor in cases of osteosarcomas, Ewings and chondrosarcomas.

**Conclusion:** 1) MRI is accurate in delineating the extent of bone sarcomas. 2) A margin of 2 to 2.5 cm on MRI may be sufficient enough for adequate oncological clearance while preserving normal tissue (as maximum underestimation was 1.5 cm, and mean difference was 0.54 cm with a SD of 1.5cm). 3) Post chemotherapy MRI correlates better with histopathology than pre chemotherapy MRI, even though the correlation of both pre and post chemos MRI with pathology are significant.