



P2:108

Reactive Bone Lesions in Postchemotherapy Pediatric Bone Tumor Specimens: Implications on Surgical Planning by Preoperative MRI

Iman Gouda¹, Iman Zaki¹, Ahmed El Ghoneimy¹, Magdy El Sherbiny¹, Ranin Soliman¹, Manal Zamzam¹

¹ Children's Cancer Hospital Egypt, Egypt

Background: Therapy-associated changes in bone tumor specimens include changes in tumour volume and reactive changes associated with tumor necrosis as well as marrow changes and periosteal reaction.

Aim: This study analyzed the accuracy of pre-operative MRI images in determining the local tumor extent before surgery in patients with high-grade osteosarcoma and Ewings sarcoma after neo-adjuvant chemotherapy.

Methods: From January 2009 till January 2011, a total number of 75 pediatric patients presented at the Children Cancer Hospital Egypt with malignant tumors in long bones; High-grade osteosarcoma (n=56) and Ewing sarcoma (n=19) patients treated with neo-adjuvant chemotherapy and definitive surgery were analyzed. We compared the accuracy of the intra-osseous extent of the tumor as measured by pre-operative MRI, with the actual extent of the tumor as assessed by gross and microscopic examination of the resected specimens. Difference in measurements of more than 1 cm was considered as discrepancy.

Results. The extent of intra-osseous tumor was defined accurately by preoperative MRI in 50 (89%) osteosarcoma cases and 15 Ewings sarcoma cases (78%). The mean overestimation between definitive histopathology and MRI measurements in Osteosarcomas was 3.2 (median = 2.5). In Ewings sarcoma, the mean overestimation by MRI was 2 cm (median = 2.5). In osteosarcoma, the correlation coefficient between maximum radiological dimension determined by pre-operative MRI and by pathology was 0.967 (p-value < 0.001). In Ewing's sarcoma, the correlation coefficient between maximum radiological dimension and pathology was 0.973 (p-value < 0.001). Important causes for inaccurate measurements from MRI included bone marrow changes as edema or focal necrosis, and false positive epiphyseal infiltration.

Conclusions. Preoperative evaluation of tumor extent using MRI is a reliable method to assess the local extent of bone tumors in children. These findings are useful in planning surgical limb salvage procedures and stress the ineffectiveness of the "therapy-associated changes" in bone specimens on preoperative radiological estimation of tumor extent. Intra-operative frozen section examination of the margins should be considered as part of the assessment in limb-sparing procedures. More consideration should be given to distinguishing treatment-related reactive changes.

E-mail (main author): imangouda@gmail.com