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Bone marrow aspiration and biopsy in the initial staging of extraskeletal Ewing sarcoma

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Background: Extraskeletal Ewing sarcoma (EES) are rare tumors within the Ewing sarcoma (ES) family with a high rate of metastasis. Initial staging studies for EES include imaging and bone marrow aspiration and biopsy (BMAB). The accurate diagnosis of metastatic disease is essential in guiding treatment and determining patient prognosis. Recent studies on osseous-based ES have questioned the utility of BMAB compared to modern imaging modalities in detecting metastatic disease. However, no such investigation has been performed to determine the utility of BMAB in EES.

Purpose: This study aimed to determine the utility of BMAB in the workup of EES. Specifically, we hypothesize that BMAB would not detect additional cases of metastatic disease beyond those already diagnosed by advanced imaging.

Patients and Methods: A retrospective review of biopsy-confirmed EES patients treated at a single institution between 1994 – 2021 was performed. Initial diagnostic and staging information including the use of PET scan, bone scan, and BMAB was collected. Metastatic disease at the time of presentation was noted. Patients were excluded if adequate records of their initial diagnosis and staging were not available or if the diagnosis of Ewing sarcoma was not definitive.

Results: Of 109 patients, 91 met criteria for inclusion. Fifty-four patients (59%) underwent a BMAB. All patients who underwent BMAB also had PET and/or bone scans as part of their initial workup. Of those 54 patients, 10 (19%) were found to have metastatic lesions at the time of presentation. Site of metastasis included lung (n=5), bone (n=4), liver (n=1), bowel (n=1), and distant lymph nodes (n=1). Metastases were present on PET scan in 5 patients, bone scan in 4 patients, and CT Chest in 2 patients. BMAB was negative for marrow involvement in all patients at presentation including those with metastatic disease.

Conclusions: The data in this study is consistent with studies on ES patients which showed BMAB to have low utility in detecting metastatic disease compared to PET or bone scan. Limitations include the retrospective nature of this study as well as the lack of long term follow up or outcome measures. Overall, this data indicates that the standard utilization of BMAB in the staging process of EES is of low diagnostic yield. BMAB is unlikely to diagnose metastatic involvement even in patients with known metastases to bone.