

## **Is There a Role for Positron Emission Tomography in the Staging of Langerhans Cell Histiocytosis?**

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**INTRODUCTION:** There is a lack of standardized staging imaging for Langerhans Cell Histiocytosis (LCH). Positron Emission Tomography (PET), bone scan, and skeletal survey are commonly used modalities to assess for systemic involvement. These differ substantially in radiation exposure with PET delivering significantly higher ionizing radiation. This study aimed to identify patient and disease factors associated with imaging selection and to determine whether PET improves systemic disease detection compared to other modalities.

**METHODS:** A retrospective review (2001 – 2024) was conducted of patients with biopsy-proven LCH evaluated at a single institution. Age, sex, and presenting location at diagnosis were compared. Systemic disease detection was assessed across imaging groups.

**RESULTS:** The cohort included 78 patients: 30 underwent PET, 11 bone scan, and 37 skeletal survey. Median age differed significantly by modality: PET (34 years [IQR 8–56]) vs. bone scan (13 [3–37]) vs. skeletal survey (7 [2–14])( $p < 0.001$ ). Imaging modality differed significantly by location ( $p = 0.016$ ): 53% of bone lesions were assessed with skeletal survey, 28% with PET, and 19% with bone scan. Of skin lesions, 57% received skeletal survey, 36% PET, and 7% bone scan. All lung lesions were staged with PET. PET detected systemic disease in 30% of patients, significantly higher than bone scan (9.1%) and skeletal survey (8.1%)( $p = 0.049$ ).

**DISCUSSION AND CONCLUSION:** In addition to age, the site of initial presentation affects the choice in selection of imaging modality. Further research is needed to determine whether increased systemic detection with PET translates to improved clinical outcomes, especially given its higher radiation burden.