Is PET-CT an accurate method for the differential diagnosis between Chondroma and Chondrosarcoma?

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ABSTRACT

The differential diagnosis between chondroma and intraosseous chondrosarcoma is based on imaging or clinical exams, but only a biopsy can confirm diagnosis. The aim of this study was to evaluate the accuracy of PET-CT in differentially diagnosing chondroma and chondrosarcoma.

From October 2009 to May 2015, 40 patients with cartilaginous bone lesions in the extremities (13 men and 27 women; 32.5% and 67.5%, respectively) were prospectively included in the study. Patients ranged in age from 21 to 68 years, with a mean age of 45 years. Lesions were located in the long bones: in the proximal humerus in 24 (60.0%) patients, in the femoral shaft in two (5.0%), in the distal femur in nine (22.5%), in the proximal tibia in one (2.5%) and in the proximal fibula in four (10.0%) patients.

Among the 40 patients studied, sixteen (40.0%) had SUVmax less than or equal to 2.0, were diagnosed as chondroma and were treated conservatively. Follow-up ranged from 6 to 68 months, averaging 35 months. Twenty four (60.0%) patients with SUVmax greater than 2.0 were diagnosed as chondrosarcoma and underwent surgery.

The estimated prevalence of chondrosarcoma was 0.5652 (95% Confidence interval [CI] = 0.3487 to 0.7611), with a SUVmax sensitivity of 0.9 (95% CI = 0.7165 to 1) and specificity of 0.8 (95% CI = 0.3526 to 0.9190). The negative predictive value (also called true negative) was 0.889 (95% CI = 0.5609 to 1) and the positive predictive value was 0.818 (95% CI = 53.69 to .9502).

We conclude that PET-CT is an objective quantitative method for differentiating between chondromas and chondrosarcomas. Moreover, SUVmax values exhibit high sensitivity, high specificity, high positive predictive value and high negative predictive value in this differential diagnosis.