Journal of Clinical and Medical Images

ISSN: 2640-9615

Clinical Image

Malignant Transformation in A Case of Multiple Osteochondromas: Role of [18F]-FDG PET/CT Imaging

Tolomeo A[1*], Lopopolo G[1], Dimiccoli V[1], Perioli L[2], Nardella G[3], Scilimati A[4] and Modoni S[3]

[1]Radiopharmaceutical Division, ITEL Telecomunicazioni srl, Ruvo di Puglia, Italy

[2]Department of Pharmaceutical Sciences, University of Perugia, Perugia, Italy

[3]Department of Nuclear Medicine, University Hospital "Ospedali Riuniti", Foggia, Italy

[4]Department of Pharmacy-Pharmaceutical Sciences, University of Bari, Bari, Italy

Volume 4 Issue 5- 2020

Received Date: 30 Apr 2020

Accepted Date: 16 May 2020

Published Date: 21 May 2020

2. Key words

Multiple osteochondromas, Chondrosarcoma, Malignant transformation, [18F]-FDF PET/CT, SUVmax.

1. Clinical Image

We present a 19-year-old man affected by osteochondromatosis since he aged 9. Multiple enchondromas showed asymmetric distribution of osseous and cartilage lesions with major deformities of pelvis and long bones and minor lesions in left scapula and few ribs.

He went to our observation because of size increase of left pelvis and thigh deformities, pain and cortical destruction that gave us a suspicion of malignant transformation.

For these reasons, the patient underwent [18F]-FDG PET/CT scan.

Standardized Uptake Values (SUVmax) were considered for benign and suspected malignant lesions Axial [18F]-FDG PET/CT fusion images (Figure 1) of the right (a) and left (b) humerus, right (c, d) and left iliac bone (e), right (f, g) femur and the proximal end of the tibia and fibula (h) showed cartilage capped bony projections arising on the external bone surface. No significant activity was showed in these certainly being osteochondromas and SUVs were below 1.0.

Axial [18F]-FDG PET/CT fusion images (i, j) and coronal images (k) of left ischio-pubic branch showed a more heterogeneous appearance with cortical erosions, invasion of the surrounding soft tissues and a more disomogenous surface. Significantly higher SUVs were observed at borders of these lesions (4.3, 3.8, 5.2) whereas the core had a lower metabolic activity (2.6, 1.6, 2.8) but still higher than benign lesions.

The patient underwent complete surgical excision of left ischio-pubic branch. Hystology confirmed diagnosis of grade II chondrosarcoma.

A second [18F]-FDG PET/CT scan (Figure 2) was performed eighteen months after surgery. CT images showed showed a mild enlargement of osteochondromas in some skeletal seg- ments, but no increased SUVs, all below 1.0, were found at PET images.

The risk of malignant transformation of osteochondromas, that are benign lesions and do not affect life expectancy, is 1–5%. The prognosis is strictly dependent on histological grade, with 10-year survival rates ranging from 83% for grade I chondrosarcomas to 29% for grade III chondrosarcomas [1, 2].

This case highlights the need for continuous surveillance of the risk of malignant transformation of multiple osteochondromas into chondrosarcomas that usually occur at an earlier age than chondrosarcoma alone [3].

From the diagnostic imaging point of view, anatomical image techniques (CT, RM) assess very well the morphological changes in the bone. [18F]-FDG PET/CT is useful to evaluate metabolic changes suspected for malignant transformation, since 18F-FDG uptake is usually higher in sarcomas than in benign lesions [4, 5].

***Corresponding Author (s):** *Anna Tolomeo, Radiopharmaceutical Division, ITEL Telecomunicazioni srl, Via A. Labriola snc, ZI, Ruvo di Puglia 70037, Italy, Tel: +39 348 0386774, Fax: +39 080 3611114, E-mail: a.tolomeo@itelte.it*

Citation: Anna T et al., Malignant Transformation in A Case of Multiple Osteochondromas: Role of [18F]-FDG PET/CT Imaging. Journal of Clinical and Medical Images. 2020; V4(5): 1-2.

The Standardized Uptake Value (SUV), a semi-quantitative index of tracer uptake in a region of interest that reflects glucose consumption, correlates with chondrosarcoma grade (higher the grade, higher the SUV), while in benign lesion it is very low [6] and sometimes it can avoid percutaneous biopsy [7].

Moreover, [18F]-FDG PET/CT allows to diagnose local recurrences and distant metastases measuring their metabolic activity [8].

In conclusion, the success of the complete surgical excision of the lesion depends very much on the careful evaluation of the extension and metabolic activity and, for this purpose, [18F]-FDG PET/CT can play a very relevant role.

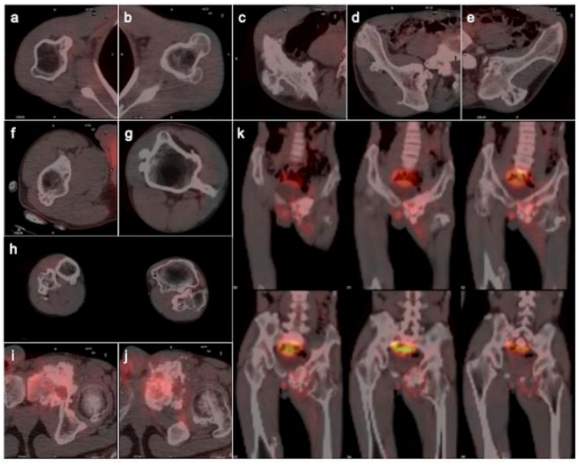

Figure 1: [18F]-FDG PET/CT whole body scan performed performed to metabolically characterize suspicious changes (I, j, k) due to malignant transformation. The alterations highlighted in the left ischio-pubic branch showed SUV ranging from 3.8 to 5.3, significantly higher than that found on benign lesions (a, b, c, d, e, f, g, h) (SUV < 1.0).

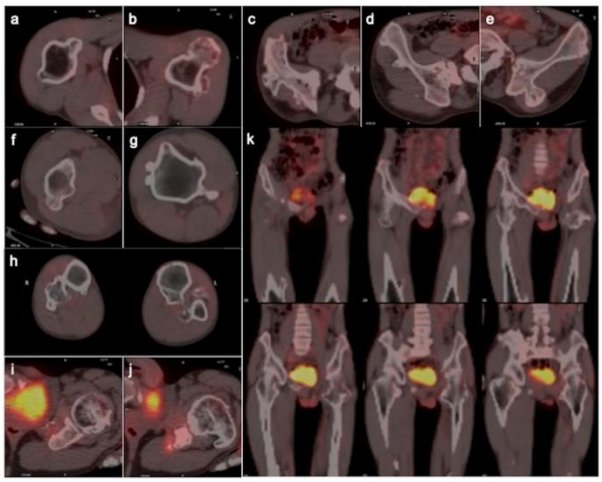

Figure 2: [18F]-FDG PET/CT whole body scan performed performed after surgical excision of the malignant lesion which proved to be a grade II chondrosarcoma. None of the lesion had SUV higher than 1.0.

References

1. Bovee J. Multiple osteochondromas. Orphanet Journal of Rare Diseases. 2008; 3: 1-7.
2. Muramatsu K, Kawakami Y, Tani Y, Taguchi T. Malignant transformation of multiple enchondromas in the hand: case report. J Hand Surg Am. 2011; 36(2): 304-7.
3. Silve C, Jüppner H. Ollier disease. Orphanet Journal of Rare Diseases. 2006; 1: 37.
4. Hicks RJ. Functional imaging techniques for evaluation of sarcomas. Cancer Imaging. 2005; 5(1): 58–65.
5. Purandare NC, Rangarajan V, Agarwal M, Sharma AR, Shah S, Arora A, et al. Integrated PET/CT in Evaluating Sarcomatous Transformation in Osteochondromas. Clin Nucl Med. 2009; 34: 350–354.
6. Subhawong TK, Winn A, Shemesh SS, Pretell-Mazzini J. F-18 FDG PET differentiation of benign from malignant chondroid neoplasms: a systematic review of the literature. Skeletal Radiol. 2017; 46: 1233–1239.
7. Purandare NC, Puranik A, Shah S, Agrawal A, Puri A, Gulia A, et al. Can 18F-FDG PET/CT diagnose malignant change in benign chondroid tumors? Nucl Med Commun. 2019; 40: 645-651.
8. Feldman F, Van Heertum R, Saxena C. 18Fluoro-deoxyglucose Positron Emission Tomography Evaluation of Benign Versus Malignant Osteochondromas: Preliminary Observations. J Comput Assist Tomogr 2006; 30: 858Y864.