A Case of Muscular Sarcoidosis Diagnosed using FDG-PET

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FDG-PETにより検出できた筋サルコイドーシスの1例

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Summary

In this case report, a female patient underwent three different imaging modalities, FDG-PET, 67Ga scintigraphy, and MRI of the left limb to evaluate dysbasia. The FDG-PET and 67Ga scintigraphy findings were contradictory, but the MRI confirmed a lesion in the left leg, which later identified as sarcoidosis. FDG-PET may be a more sensitive tool for identifying extrapulmonary lesions than that by using 67Ga scintigraphy.

要 旨

この症例報告では,歩行障害の評価のために左下腿のFDG－PET, 67Gaシンチグラフィ, MRIの3つの異った画像検査を女性患者に行った。FDG-PETと67Gaシンチグラフィの所見は一致しておらず, MRIにて検出された左下腿の病变からサルコイドーシスと診断された。FDG-PETは67Gaシンチグラフィよりサルコイドーシスの肺外浸潤を評価するより感度の高い検査の可能性がある。

Key words: 18F-FDG PET; 67Ga scintigraphy; sarcoidosis; muscular involvement

Sarcoidosis is a systemic granulomatous disease of unknown origin involving multiple organs and tissues. It frequently affects the lung and hilar lymph nodes, but muscular involvement can rarely occur. There are three main clinical types of muscular sarcoidosis: the acute myositis type, the atrophic type, and the nodular type. We report a case of sarcoidosis with muscle involvement diagnosed on FDG-PET.

Case Report

A 54-year-old woman was hospitalized due to dysbasia. On examination, a palpable mass was detected on the lateral left leg. Blood tests showed remarkably elevated erythrocyte sedimentation rate (33mm/hr).

A whole-body PET was performed using an Advance PET scanner (Siemens Medical Solutions) 45min after administrating 9.7 mCi (359 mBq) of FDG intravenously. Transmission images were acquired for 5 min per table position, and emission images, for 3 min per table position. Images were corrected for attenuation, and standardized uptake values were calculated using a commercially available algorithm. In addition, whole-body 67Ga (gallium citrate) scintigraphy was performed 24 hr after administering 3.7 MBq/kg of 67Ga intravenously. An MRI was performed with a 1.5 T superconducting magnet (Magneton Vision, Siemens Medical Solutions) using a body phased-array coil. The MRI sequences included a T1-weighted spin-echo (TR500/TE15), fast spin-echo T2-weighted images (TR4000/TE100) and enhanced spin-echo T1-weighted images (0.1 mmol/kg of intravenous gadoterate meglumine [Gd][Magnescope, Guerbet]).
The PET showed increased uptake in the left leg (maximum standardized uptake value, 2.69) (Fig. 1), but the $^{67}$Ga scan showed no abnormal uptake (Fig. 2). The MRI revealed a donut-shaped lesion that was nearly

![Fig. 1. A 54-year-old woman diagnosed with sarcoidosis. The coronal FDG-PET image shows FDG uptake in the left leg.](image1)

![Fig. 2. $^{67}$Ga scintigraphy in a 54-year-old woman. The $^{67}$Ga scan shows no abnormal uptake in the left leg.](image2)

![Fig. 3. T1 and T2 weighted and contrast-enhanced MRI of the left leg.](image3)

(a) The T1-weighted axial image shows a donut-shaped lesion that is nearly isointense to the muscle, with low signal intensity centrally.

(b) T2-weighted axial image, same level. The lesion shows mildly increased in signal intensity compared to the surrounding muscle and low signal intensity centrally.

(c) On the contrast-enhanced T1-weighted axial image, the lesion periphery shows enhancement, but the central region does not.
isointense to the muscle, with low signal intensity centrally on the T1-weighted image and mildly increased signal intensity compared to surrounding musculature on the T2-weighted image. After administering Gd intravenously, the peripheral region of the lesion enhanced on the T1-weighted image, but central region did not (Fig. 3).

A muscle biopsy of the site revealed a noncaseating granuloma, confirming a diagnosis of sarcoidosis.

Discussion

Sarcoidosis is a chronic inflammatory disease of unknown cause characterized histologically by noncaseating granulomas in affected tissues. Muscular sarcoidosis is a rare entity and is seen in approximately 6% of patients with sarcoidosis. Muscular involvement is usually asymptomatic. Muscles in the proximal the extremities are a frequently involved.

\(^{67}\)Ga scintigraphy has been widely used in studies of sarcoidosis. These studies describe a typical pattern of \(^{67}\)Ga uptake in sarcoidosis cases known as a "lambda" pattern of mediastinal lymphadenopathy, which reflects the right paratracheal and bilateral hilar involvements.

The FDG uptake increases when the metabolic activity is increased by inflammatory cells. In sarcoidosis, macrophages are activated and play an important role in granuloma formation; this may explain the strong FDG uptake in granulomatous lesions of sarcoidosis. Muscular involvement on FDG PET compared to \(^{67}\)Ga scanning has only been reported once previously.

Okumura et al. compared \(^{18}\)F-FDG PET to \(^{67}\)Ga scintigraphy in 11 patients with cardiac sarcoidosis. The sensitivity of \(^{18}\)F-FDG PET (100%) in detecting cardiac sarcoidosis was significantly (P<0.01) higher than that of \(^{67}\)Ga scintigraphy (36%). In our case FDG PET showed increased uptake in the left leg, but the \(^{67}\)Ga scintigraphy showed no abnormal uptake. Thus, \(^{18}\)F-FDG PET appears to be a promising alternative to \(^{67}\)Ga scintigraphy for evaluating the extent of extrapolmonary sarcoidosis.

In conclusion, our case shows that FDG-PET may be a more sensitive tool for evaluating the extent of muscle involvement in sarcoidosis compared to \(^{67}\)Ga scintigraphy.

Reference

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