

Diagnosis of Spondylodiscitis with 18F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Scan in a Patient with Bacteremia

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Introduction

A 45 year-old man presented fever, headache, hepatosplenomegaly and positive meningeal signs. Antibiotic treatment with Cloxacillin was initiated (1g intravenously every 6 hours) and then stopped when bacterial meningitis was excluded. Fever of unknown origin was considered and Cloxacillin was re-started with a higher dose (2g intravenously every 6 hours) after positive haemocultures for multisensitive *Staphylococcus aureus* and echocardiography showed possible vegetation on the tricuspid valve.

A whole body positron emission tomography/computed tomography (PET/CT) scan with 18F-Fluorodeoxyglucose (FDG) was performed looking for infective endocarditis (Figure 1). No pathologic FDG uptake was evident in the valve, probably because of the time-lapse since the initiation of antibiotic treatment. However, PET/CT showed intense FDG pathological uptake in the vertebral bodies, disc and spinal canal of C5-C6 (Figures 1A-1C), diffuse FDG uptake in the right thigh between the tensor fascia lata and quadriceps femoris muscles (Figure 1A), and lung parenchyma (Figures 1D and 1E), all suggesting embolic infectious strokes. Magnetic resonance imaging (MRI) was indicated (T1 sequence Figure 2A, T2 sequence Figure 2B), confirming cervical spondylodiscitis changes in C5-C6 vertebral bodies with destruction of the intervertebral space and increased soft tissue in the anterior epidural space and paravertebral space with laminar morphology. Because of the imaging findings, two new antibiotics were added, Meropenem (2g IV every 8 hours for 7 days) and Gentamicin (2 mg/kg loading dose, followed by 5 mg/kg IV every 24 hours for 7 days). After three months of antibiotic treatment, a PET/CT with complete resolution of the pathological uptakes confirmed the favourable evolution of the embolic infection. Additionally, the CT scan evidenced the fusion of C5-C6 vertebral bodies, being the most frequent complication of spondylodiscitis.

Spondylodiscitis, vertebral osteomyelitis or infectious spondylodiscitis is an uncommon disease (<4%) that usually affects male adults. The most frequent way of developing the disease is via hematogenous transmission caused by extraspinal infections. Postsurgical and posttraumatic are other ways of transmission caused by direct bacterial inoculation. Finally, nearness is another way of transmission, when an infection extends to the nearby tissues [1]. *Staphylococcus aureus* is the most frequent cause of the disease, being involved in more than 50% of cases. Back pain is the most frequent symptom, affecting the lumbar region in 75% of cases. MRI is a powerful diagnostic tool that can be used to help evaluate spinal

infection and help distinguish between an infection, the extension and local effects and other clinical conditions [2].

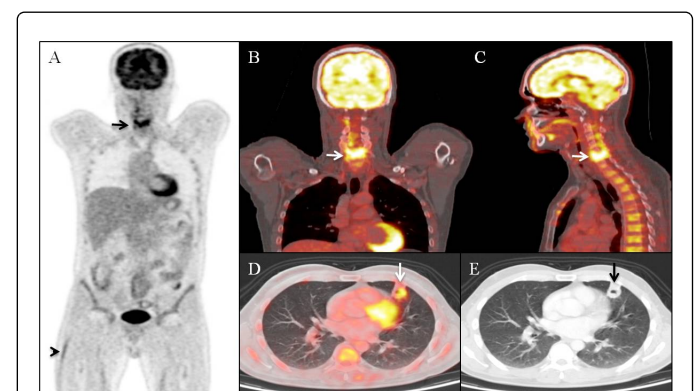


Figure 1: Whole body Siemens Biograph™ TruePoint™ PET/CT. Sagittal and coronal images shows pathological FDG uptake (SUVmax 5.9) in vertebral body, disc and spinal canal of C5-C6 (A,B,C, arrow). Coronal image shows diffuse FDG uptake in right thigh, between the tensor fascia lata muscle and quadriceps femoris muscle with SUVmax 2.9 (A, arrowhead). Axial images shows a cavitated pulmonary nodules with FDG uptake (SUVmax 5.8) in lingula which would correspond to septic emboli (D, E, arrow).

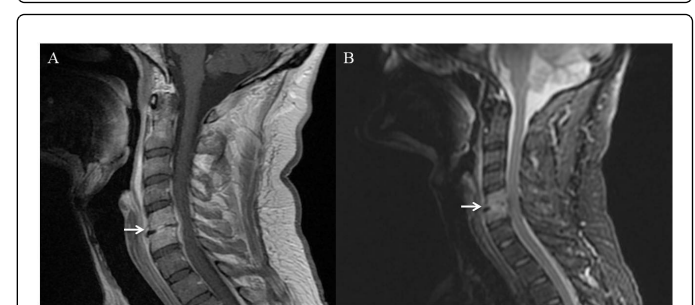


Figure 2: Sagittal Post contrast MRI Excite 1.5T HDXT. T2-weighted sequences A and B changes spondylodiscitis C5-C6 with destruction of the intervertebral space (arrow).

FDG PET/CT is an emerging tool for the diagnosis of infective endocarditis, as FDG accumulates in areas of increased glucose metabolism, such as inflammatory tissues. FDG PET/CT has

demonstrated a high efficacy for the detections of complications such as spondylodiscitis and other embolic strokes located in lungs or spleen. Possible indications would be to confirm or discard the infection in a patient with bacteremia caused by gram positive microorganisms, to estimate its extension, and to detect associated complications. Therefore, PET/CT may have an impact on the therapeutic treatment, indicating the initiation of antibiotic therapy and allowing a precise monitoring of the disease [3] (Figure 3).

References

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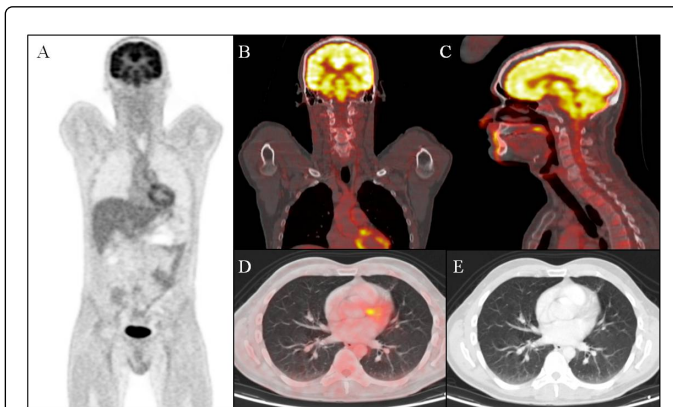


Figure 3: Whole body Siemens Biograph™ TruePoint™ PET/CT. Sagittal, coronal and axial images. PET/CT does not show any pathological uptake in vertebral body, disc and spinal canal of C5-C6 (A,B,C), in right thigh (A), between the tensor fascia lata muscle and quadriceps femoris muscle and lungs (D,E) after treatment confirming good response to antibiotics.