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Abstract (poster session)

**18F-FDG PET/CT scan for the diagnosis and monitoring of treatment efficacy in an animal model of Staphylococcus aureus foreign-body osteomyelitis**

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Backround: Infection of prosthetic orthopaedic devices is a growing problem. Modern imaging modalities including computer tomography (CT) and magnetic resonance imaging often are ineffective in the diagnosis of osteomyelitis and in the assessment of treatment efficacy in patients with joint prosthesis or metal implants, because of artifacts. 18F-FDG PET / CT scan is promising in the diagnosis of bone infections. Herein, we used a rabbit model of experimental foreign body osteomyelitis to evaluate the efficacy of 18F-FDG PET/CT scan in the diagnosis of infection and in evaluating therapeutic response. Methods: We used a modified version of the tibial osteomyelitis rabbit model of Norden in which the medullary cavity is inoculated with methicillin sensitive Staphylococcus aureus (MSSA strain ATCC 29213). A cortical defect was surgically made on the metaphysis of the tibia with a 2-mm drill bit, and 0.1 ml of 108 CFU suspension of the MSSA isolate was injected into the bone. A 25-gauge needle was placed through the hole and served as a foreign body. Finally, the drilling hole was plugged with sterile bone wax. 21 days later all animals had a PET/CT scan and a second surgery where swab specimens and bone fragments were taken for culture to confirm the presence of infection. Successfully infected animals were treated with daptomycin (60 mg/kg/day) administered intraperitoneally. A new PET/CT scan was performed at the end of treatment, all animals were sacrificed, infected tibias were harvested and bone specimens underwent quantitative culture and biopsy. Results: A total of 18 animals were inoculated with MSSA and 1 control animal with normal saline. After 21 days bone histology and culture showed infection in 16 animals and failure to establish infection in 2 animals. PET/CT was positive in all infected animals and negative in the 2 unsuccessfully infected animals and the control. Four animals were treated for 2 weeks (all unsuccessfully), 6 animals for 3 weeks (1 successfully, 3 treatment failures) and 6 animals for 6 weeks (4 successfully, 2 treatment failures). Treatment failure was defined as a positive bone culture/histology after the sacrifice. PET/CT scan was positive in all unsuccessfully treated animals and negative in all successfully treated animals. Conclusions. In our animal model, 18F-FDG PET / CT scan is an efficient tool in the diagnosis of foreign body osteomyelitis and in monitoring the efficacy of treatment.