Abstract: 31

18F-FDG-PET/CTA of prosthetic heart valves: Postsurgical inflammatory patterns and its temporal evolution. Can we question the 3-month limit of the current guidelines?

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Positron Emission Tomography (PET)

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Background:

18F-FDG-PET/CT-Angiography (PET/CTA) is a quite new technique providing improved diagnostic accuracy in prosthetic valve endocarditis (IE). While its high negative predictive value could be useful in rejecting IE even recently after surgery, there is little available data on the morphologic and metabolic features following prosthetic heart valve (PHV) implantation. Hence, early postoperative inflammation could be misdiagnosed as false-positive cases of infection. We prospectively evaluated a group of postoperative patients without suspected infection to define characteristic image findings after recent surgery and its short-term evolution.

Methods:

We prospectively recruited 37 patients divided into 2 subgroups between Jan-2015 and Feb-2016. They underwent seriated PET/CTA examinations at 1, 6 and 12 months after valve replacement surgery. We evaluated the metabolic features (FDG uptake distribution and intensity) and the possible anatomic changes (soft tissue reaction, post-surgical collections and perivalvular complications) following PHV implantation, and the temporal evolution features of these findings were evaluated.

Results:

A total of 111 PET/CTA scans were performed in the 37 patients. There were 19 aortic PHV (13 biological; 6 mechanical) and 18 mitral PHV (8 biological; 10 mechanical). FDG uptake was visually detectable in 79.3% of cases, with a diffuse and homogeneous distribution pattern in 93%. Quantitative analysis showed an average SUVmax of 4.46 ± 1.50, SUVmean 2.80 ± 0.62 and SUVRatio of 2.28 ± 0.91 on the total of PET/CTA scans. There were no significant differences in FDG distribution pattern or uptake values between 1, 6 or 12 months, and no significant differences according to PHV type (mechanical vs. biological, SUVmax 4.67 ± 1.2 vs. 4.3 ± 1.69) or position (aortic vs. mitral, SUVmax 4.3 ± 1.41 vs. 4.63 ± 1.59). No anatomic changes or IE characteristic lesions were detected in any patient during follow-up.

Conclusion:

This data show that FDG uptake is often present in implanted PHV from the recent postoperative period. There is a characteristic pattern of FDG uptake in postsurgical inflammation with no associated anatomical lesions, features that remain stable during 1 year after implantation surgery and that help in differentiating inflammatory reactive changes from infection in most cases, even in recently implanted PHV. These findings question the 3-month safety period suggested by the current guidelines.
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