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Abstract 39: Early experience of ^{18}F-Sodium Fluoride Positron Emission Tomography/ Computed Tomography in Aortic Dissections

Maaz B.J. Syed (MBChB MSc MRCS(Ed)), Alexander J. Fletcher (MBChB BSc), Rachael O. Forsythe (MBChB PhD), Marc R. Dweck (MBChB, PhD), David E. Newby (MD, PhD, DSc)

British Heart Foundation Department of Cardiovascular Sciences, University of Edinburgh, Edinburgh, United Kingdom

Introduction: Aortic expansion from acute aortic syndrome can lead to catastrophic aortic rupture. ^{18}F-Sodium Fluoride (NaF) Positron Emission Tomography (PET) / Computed Tomography (CT) detects vascular microcalcification and predicts aortic expansion in other aortopathies such as abdominal aortic aneurysms[1]. In this pilot study, we report early results of ^{18}F-NaF PET/CT in aortic dissections.

Methods: ^{18}F-NaF PET/CT findings for three individuals with aortic dissection are reported. Peak radiotracer binding in the aortic wall is presented as a ratio to the mean blood pool activity in the right atrium. This is the tissue-to-background (TBR) ratio. TBR was calculated for the entire aorta at 3mm intervals. The peak TBR across two consecutive intervals was recorded as the Most Diseased Segment (MDS) TBR_{max}. This was done for the ascending aorta, aortic arch, descending aorta and abdominal aorta. MDS TBR_{max} was also measured for the dissection flap.

Results: Participants included a 54-year old male and 65-year old female with subacute aortic syndrome. A 49-year old male with a chronic aortic dissection was also included. All three individuals had increased aortic ^{18}F-Sodium Fluoride uptake. The mean MDS TBR_{max} in the ascending aorta, aortic arch, descending aorta and abdominal aorta was 1.85 ± 0.12, 2.26 ± 0.35, 2.66 ± 0.29 and 2.54 ± 0.08 respectively. The dissection flap had a mean MDS TBR_{max} of 2.14 ± 0.35. ^{18}F-NaF binding was independent of aortic diameter and aortic volume.

Conclusions: In this pilot study, we demonstrate increased activity on ^{18}F-NaF PET/CT within aortic tissue following aortic dissection. This is part of a larger cohort study that will report on the role of ^{18}F-NaF PET/CT in Acute Aortic Syndrome (NCT03647566).

Reference: [1] Forsythe RO, Dweck MR, McBride OMB, Vesey AT, Semple SI, Shah ASV, et al. ^{18}F-Sodium Fluoride Uptake in Abdominal Aortic Aneurysms: The SoFIA$_3$Study. Journal of the American College of Cardiology. 2018 Feb 6;71(5):513-23.

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