

# CONTRADICTION FINDINGS BETWEEN NaF-PET AND DIPHOSPHONATE BONE SCINTIGRAPHY IN A PATIENT WITH ATTR AMYLOIDOSIS AND CARDIAC INVOLVEMENT.

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## Case

A 76-year-old male was admitted to the hospital with heart failure and possible liver cirrhosis. A cardiac MRI showed thickened ventricular walls with late gadolinium enhancement highly suggestive of cardiac amyloidosis.

## Results

Unexpectedly, the NaF-PET scan turned out to be negative for cardiac uptake. However, a subsequent bone-scan did show strongly increased uptake of <sup>99m</sup>Tc-HDP within the myocardium. Thus, the diagnosis ATTR amyloidosis with cardiac involvement was confirmed, as was expected, by using the disphosphonate scan.

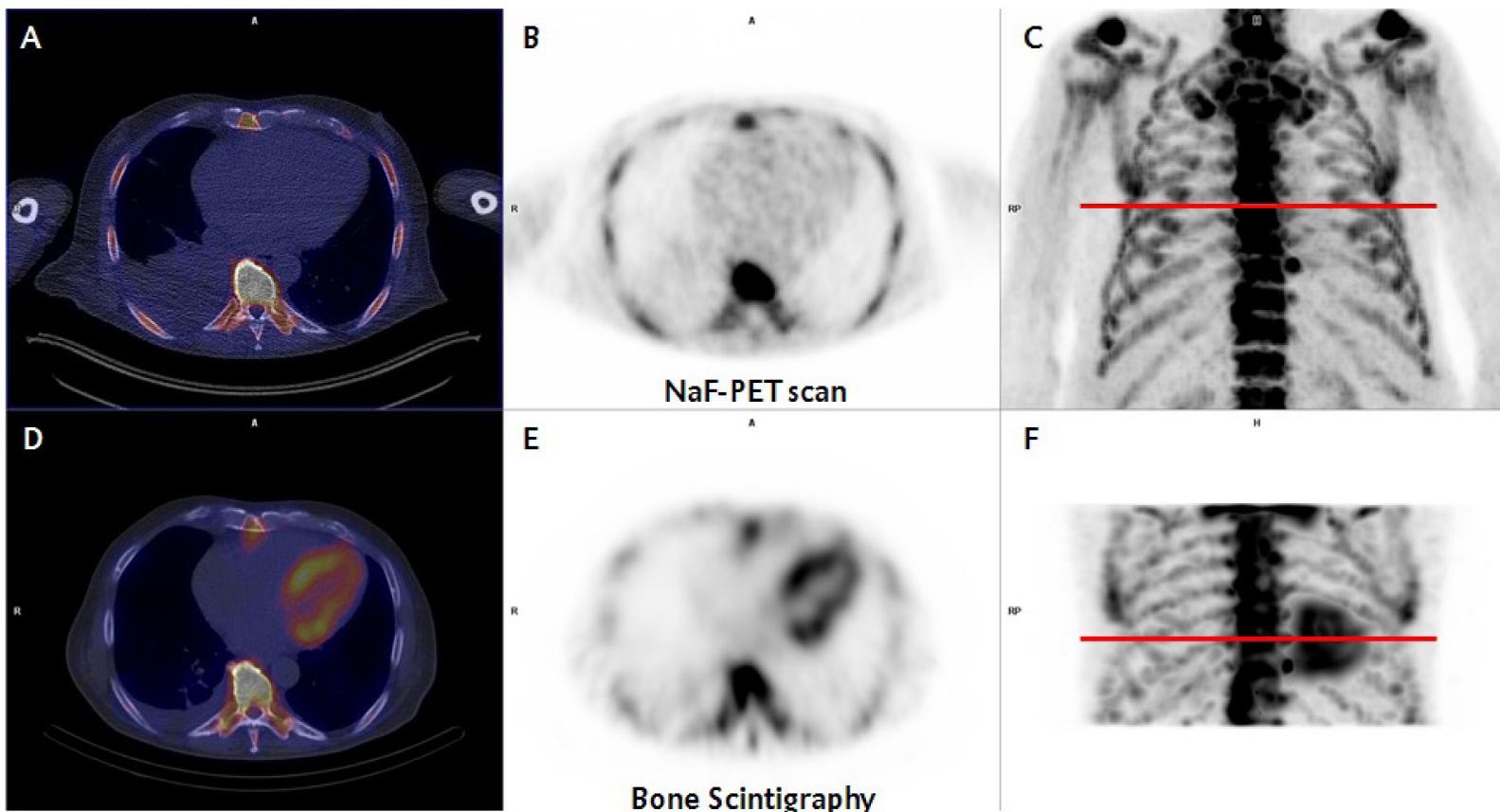


Figure 1. A-C. NaF-PET which shows no cardiac uptake of the tracer. D-F. SPECT/CT of a bone-scan with abundant tracer uptake (grade 3) within the myocardium of the left ventricle. Both scans were made within 3 weeks apart from each other. A, D. Fused image of NaF-PET (B, C) and bone-scan (E, F) with low-dose CT-scan. The red line in C and F is the level of the transverse plane used in A, B, D, and E.

Further evaluation showed slightly increased immunoglobulin free light chains with a normal ratio, reduced renal function (eGFR 56 ml/min), and normal bone marrow results. A fat biopsy showed amyloid (2+) in the Congo red stain, immunohistochemically type ATTR (TTR 9.9 ng/mg fat tissue, N<7.4) that was negative for AA, kappa and lambda. DNA analysis of TTR did not show a mutation. A heart biopsy was not performed. The diagnosis was wild-type ATTR amyloidosis with cardiac involvement. A bone scan, in this hospital usually a NaF-PET scan, was performed to confirm the diagnosis.

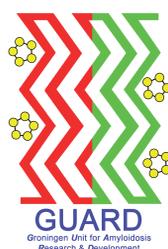
Despite our current lack of knowledge to explain this phenomenon, there is information available about the normal binding of these tracers to bone. NaF binds to bone by ion-exchange, whereas diphosphonate has up to 3 different binding mechanisms.

## Conclusion

- NaF-PET and bone-scans are not interchangeable.
- Further study on the mechanisms of cardiac tracer binding is needed to account for this difference.



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