SPECT Views for Cardiac Amyloidosis Imaging

TO THE EDITOR: As I was reading articles on cardiac amyloidosis in the June 2023 issue of *Journal of Nuclear Medicine Technology* in preparation for a lecture to my students, I came across a contradiction that I would like to get sorted out. According to the continuing education article (*1*), ^{99m}Tc-pyrophosphate SPECT images are to be displayed in cardiac views (short axis, vertical long axis, and horizontal long axis). In the practical protocol tip (*2*), however, the images are to be displayed in transverse, sagittal, and coronal sections. I can see the wisdom of both tomographic orientations. Since cardiac amyloidosis is a problem that affects the entire myocardium, heart-oriented views should be easy to create. On the other hand, we do not usually need to see bone uptake in other types of cardiac studies, such as myocardial perfusion imaging. Standard body planes will make the comparison of ^{99m}Tc-pyrophosphate uptake in the heart to that in bone easier to perceive. I would like to have the authors reconcile these 2 display suggestions.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Schockling EJ, Farrell MB, Embry-Dierson M, et al. Cardiac amyloidosis imaging, part 2: quantification and technical considerations. *J Nucl Med Technol.* 2023;51:90–98.
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Published online Nov.12, 2024.
DOI: 10.2967/jnmt.124.268369

REPLY: Thank you for your eagle-eyed attention to detail and for bringing the inconsistency to our attention regarding the SPECT reconstruction display between 2 articles published in the June 2023 *Journal of Nuclear Medicine Technology* (*1,2*). Unfortunately, there is no clear-cut answer to your question, though, as both displays are correct. However, we should have been more specific in our descriptions.

Currently, there are no published guidelines on cardiac amyloidosis imaging, specifically on processing the SPECT images, which are critical for accurate study interpretation. The good news is that the SNMMI guidelines committee is in the process of writing guidelines for cardiac amyloidosis imaging.

SPECT image display orientation is based on the reconstruction method used. If cardiofocal reconstruction is used (e.g., myocardial perfusion imaging), the images should be displayed in the short, horizontal long-, and vertical long-axis orientation. If chest reconstruction is used (e.g., bone SPECT), transverse, coronal, and sagittal images should be displayed. The simple answer is that both reconstructions and image displays should be performed on all patients. Chest reconstruction is necessary to visualize ribs for visual scoring and cardiofocal reconstruction to evaluate whether tracer distribution is focal, patchy, or diffuse.

Again, thank you for bringing this issue to our attention. As the issue is still fluid, we will wait to address it once the new guidelines are published.

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Published online Nov.12, 2024.
DOI: 10.2967/jnmt.124.269000

Comment Regarding "Vapocoolant Analgesia for Breast Lymphoscintigraphy: A Prospective Clinical Trial"

TO THE EDITOR: I am writing to you regarding the article "Vapocoolant Analgesia for Breast Lymphoscintigraphy: A Prospective Clinical Trial" (*1*). Although the trial highlights the benefits of vapocoolants for the control of pain with needle procedures, I have several issues with the trial to address.

First, the trial design is limited by its 29-patient sample size, which weakens its overall clinical significance. Second, the trial does not contain a control group to compare the self-reported pain scale value, which further weakens its overall clinical significance. Third, the trial used a vapocoolant product that was irradiated to obtain sterility, creating toxic hydrofluoric acid in the product far in excess of permissible Occupational Safety and Health Administration (OSHA) limits.

The article states "that the Food and Drug Administration cleared a vapocoolant for sterile procedures, which instigated this clinical trial, the specific product being Nüm topical anesthetic spray, created by 623 Medical and distribution by Gilero." According to Nüm's Food and Drug Administration 510(k) summary (*2*), this hydrofluorocarbon-based product uses radiation to achieve sterility. No other Food and Drug Administration–cleared vapocoolants have used radiation. Previous literature (*3*) and recent independent third-party testing has shown that radiating a hydrofluorocarbon creates toxic hydrofluoric acid far greater than U.S. OSHA immediate danger to life and health levels. Nüm's Food and Drug Administration 510(k) summary failed to address the presence of hydrofluoric acid created by the radiation.

In independent third-party testing, 5 Nüm lots were tested for hydrofluoric acid (HF) by 2 independent testing laboratories. We

had 4 Nüm lots analyzed at Kent State University's Department of Chemistry using ion chromatography (IC) and nuclear magnetic resonance (NMR) spectroscopy. The Kent State IC methodology was performed by bubbling Nüm sample contents into IC buffer, analyzed by IC, and calculated by a hydrogen fluoride (HF) standard curve. Similarly, Kent State's NMR methodology was performed by bubbling Nüm contents into buffer, analyzed by NMR, and calculated with an HF standard curve. The 4 Nüm lots tested by Kent State revealed between 27 and 64 ppm of HF, 68 and 91 ppm of HF, 71 and 101 ppm of HF, and 56 and 107 ppm of HF (*5*).

Honeywell had 2 Nüm lots analyzed by IC at Honeywell Performance Materials and Technologies Buffalo Research Lab. Honeywell Lab bubbled Nüm into IC buffer, analyzed by IC, and calculated with an HF standard curve. The 2 Nüm lots tested by Honeywell IC demonstrated 49 ppm of HF and 69 ppm of HF (*6*).

OSHA Immediate Danger to Life and Health for hydrofluoric acid is 30 ppm (*4*). The test results for the Nüm product indicated a substantially greater HF level than the permissible OSHA level. Notably, the elevated HF readings reveal a significant safety risk to patients sprayed with the Nüm product.

In summary, whereas this study highlights the benefits of vapocoolants to control pain for needle procedures for radiologic purposes, irradiated products, such as Nüm, pose a new risk for hydrofluoric acid contamination and, therefore, patient safety. For this reason, no manufacturers, other than the manufacturer of Nüm, have chosen to irradiate their vapocoolant products due to the safety risk of hydrofluoric acid contamination. Therefore, for these reasons, the results of the recent Nüm clinical trial should be disregarded.

DISCLOSURE

Andrew Ditto is an employee of Gebauer Company. No other potential conflict of interest relevant to this article was reported.

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Published online Sep. 17, 2024.
DOI: 10.2967/jnmt.124.267498