

Contamination of a Bracelet Following Iodine-131 Therapy: A Case Report

Bohdan Bybel, Wendy Beebe, Benedict Y. Kim, and Charles Faiman

Departments of Nuclear Medicine and Endocrinology, Cleveland Clinic Foundation, Cleveland, Ohio

A 73-y-old patient who had thyroid carcinoma had a post-treatment, whole-body ^{131}I scan. The scan demonstrated an artifact caused by a bracelet contaminated with radioactive perspiration. This finding resulted in an artifact on the scan and had potential radiation safety implications.

Key Words: iodine-131; artifact; perspiration; radiation exposure

J Nucl Med Technol 2000; 28:257–258

This patient was a 73-y-old woman who was diagnosed with thyroid carcinoma in 1992. She had a total thyroidectomy and radioiodine ablation with 150 mCi (5.55 GBq). A subsequent whole-body scan showed no residual disease. Seven years later, because of an increasing thyroglobulin level and a suspicion of recurrent disease, a diagnostic scan was performed and followed by a 150-mCi ^{131}I treatment. At 11 d post-treatment, the patient returned for a whole-body scan.

In addition to the neck uptake, the scan showed linear increased uptake across the right forearm (Fig. 1). A gold bracelet on the arm corresponded to the area of increased activity. The patient stated that she always wore that particular piece of jewelry and had not taken it off (except when washing herself) since her treatment dose. The gold bracelet itself was unremarkable having been purchased several years ago in a department store.

The bracelet was removed and imaged under the 364-keV peak (Fig. 2). It also was monitored with a pancake probe monitor. The initial reading was 20 mR/h. After it was washed thoroughly with water and Radiactwash (Biodex, Shirley, NY), it was remeasured. The subsequent reading was 4 mR/h. These findings would suggest that the radioactivity was related to radioactive perspiration that was present on the bracelet. The bracelet was put in a plastic container and returned to the patient

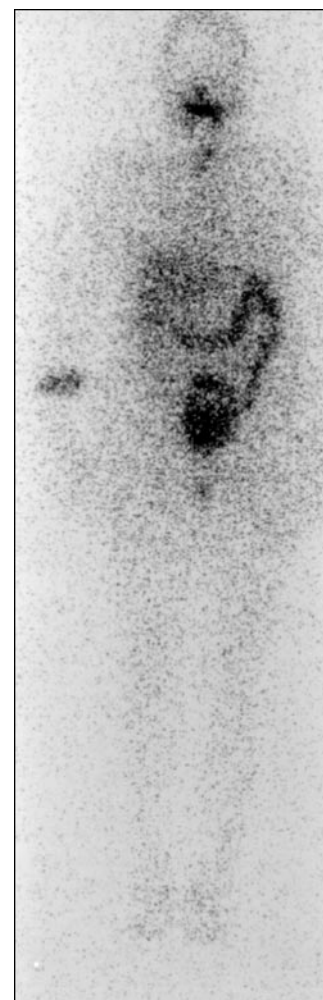


FIGURE 1. Post- ^{131}I therapy whole-body scan. Linear uptake at the right forearm was present.

with instructions not to wear it or lend it to anyone for several weeks until the radioactivity had decayed.

DISCUSSION

Several studies have described potentially false-positive findings after radioiodine treatment. Most such artifacts are due

For correspondence or reprints contact: Dr. Bohdan Bybel, Department of Nuclear Medicine, Cleveland Clinic Foundation, 9500 Euclid Gb3, Cleveland, OH 44195; Phone: 216-444-2099; E-mail: bybelb@ccf.org.

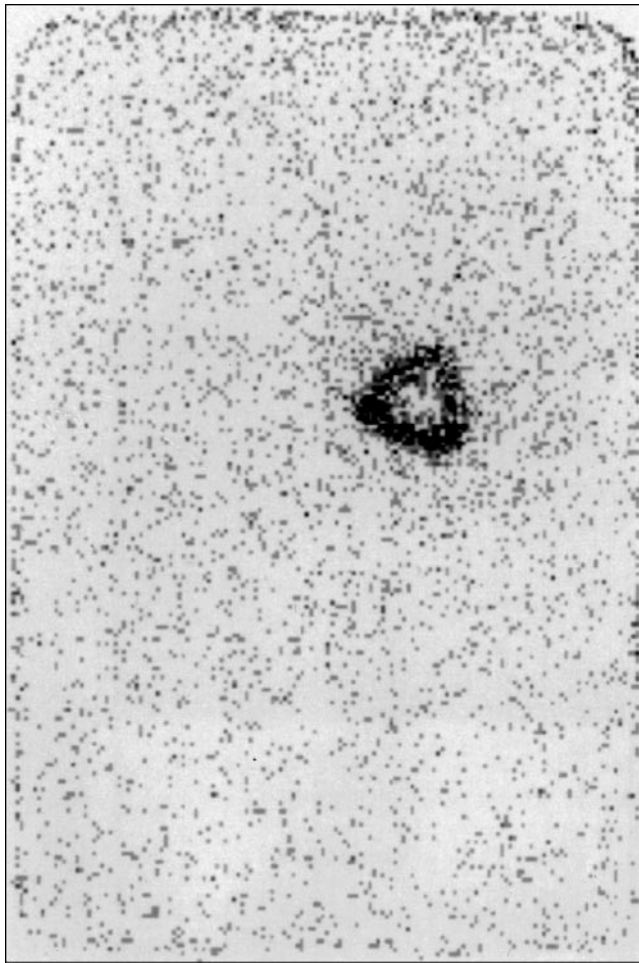


FIGURE 2. Image of patient's bracelet.

to perspiration (1–5). Cases where saliva, urine, or other body fluids can produce artifacts also have been described (6–12). In the present case, the appearance was not typical of a metastatic lesion and was identified correctly as an artifact with little

difficulty. In cases such as this one, the potential problem of unwanted radiation exposure from contaminated objects also must be addressed.

CONCLUSION

Radioactive contamination from perspiration is important to recognize, not only from a diagnostic point of view but also because of the potential of unwanted radiation exposure.

REFERENCES

1. Bakheet SM, Hammami MM. Spurious thyroid cancer bone metastases on radioiodine scan due to external contamination. *Eur J Rad.* 1993;16:239–242.
2. Bakheet S, Hammami MM. Spurious lung metastases on radioiodine thyroid and whole body imaging. *Clin Nuc Med.* 1993;18:307–312.
3. Camponovo EJ, Goyer PF, Silverman ED, et al. Axillary iodine-131 accumulation due to perspiration. *Clin Nuc Med.* 1989;14:762–763.
4. Joyce WT, Cowan RJ. A potential false-positive posttherapy radioiodine scan secondary to I-131 excretion in perspiration. *Clin Nuc Med.* 1995;20:368–369.
5. Abdel-Dayem HM, Halker K, El Sayed M. The radioactive wig in iodine-131 whole body imaging. *Clin Nuc Med.* 1984;9:454–455.
6. Bakheet SM, Powe J, Hammami MM. Radioiodine uptake in the chest. *J Nuc Med.* 1997;38:984–987.
7. Bakheet SM, Hammami MM. False-positive radioiodine whole-body scan in thyroid cancer patients due to unrelated pathology. *Clin Nuc Med.* 1994;19:325–329.
8. Pochis WT, Krasnow AZ, Isitman AT, et al. The radioactive handkerchief sign. A contamination artifact in I-131 imaging for metastatic thyroid carcinoma. *Clin Nuc Med.* 1990;15:491–494.
9. Park HM, Tarver RD, Schauwecker DS, Burt R. Spurious thyroid cancer metastasis: saliva contamination artifact in high dose iodine-131 metastases survey. *J Nuc Med.* 1986;27:634–636.
10. Gritters LS, Wissing J, Gross MD, Shapiro B. Extensive salivary contamination due to concurrent use of chewing tobacco during I-131 radioablative therapy. *Clin Nuc Med.* 1993;18:115–117.
11. Wiseman J. Bony metastases from thyroid carcinoma or contaminations. *Clin Nuc Med.* 1984;9:363.
12. Tyson JW, Wilkinson RH Jr, Witherspoon LR, et al. False-positive 131-I total-body scans. *J Nuc Med.* 1974;15:1052–1053.



Contamination of a Bracelet Following Iodine-131 Therapy: A Case Report

Bohdan Bybel, Wendy Beebe, Benedict Y. Kim and Charles Faiman

J. Nucl. Med. Technol. 2000;28:257-258.

This article and updated information are available at:
<http://tech.snmjournals.org/content/28/4/257>

Information about reproducing figures, tables, or other portions of this article can be found online at:
<http://tech.snmjournals.org/site/misc/permission.xhtml>

Information about subscriptions to JNMT can be found at:
<http://tech.snmjournals.org/site/subscriptions/online.xhtml>

Journal of Nuclear Medicine Technology is published quarterly.
SNMMI | Society of Nuclear Medicine and Molecular Imaging
1850 Samuel Morse Drive, Reston, VA 20190.
(Print ISSN: 0091-4916, Online ISSN: 1535-5675)

© Copyright 2000 SNMMI; all rights reserved.