



CASE REPORT

False-positive radioactive iodine uptake in a large uterine fibroid

Amin Saber Tanha, Faeze Rabani, Nasrin Raeisi, Emran Askari

Nuclear Medicine Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

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ABSTRACT

Incidental findings in the post-treatment whole body iodine scan (WBIS) sometimes have a broad list of differentials. We present a case of differentiated thyroid carcinoma (DTC), pT3aN1b, with family history of DTC. She was treated with adjuvant ¹³¹I therapy (5.55 GBq). The patient's post-treatment WBIS revealed a large, round iodine-avid area above the bladder, which was attributed to a massive uterine fibroid. Physical examination as well as radiologic correlation with SPECT/CT were also concordant. Fibroids can trap the radioiodine by various mechanisms. This case serves as a reminder of an uncommon pitfall in WBIS, particularly in women of reproductive age.

*Corresponding Author:

Dr. Emran Askari

Address: Nuclear Medicine Department,

Ghaem Hospital, Ahmad Abad Street,

Mashhad, Iran

Email: emran.a69@gmail.com

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INTRODUCTION

Postoperative radioactive iodine (RAI) ablation is a widely used method to ablate the remaining thyroid tissue and may eventually reduce the risk of recurrence in selected patients. Discriminating a physiologic uptake from a pathologic one in whole-body iodine scan (WBIS) is sometimes a challenging task. Herein, we present a case with iodine uptake in a large uterine fibroid.

CASE PRESENTATION

A 37-year-old lady, status post total thyroidectomy plus central and right lateral cervical lymph node dissection, was referred for ^{131}I therapy. Her pathology evaluations revealed papillary thyroid carcinoma (PTC), pT3a (multifocal and bilateral) and pN1b (with extensive lymphatic and extranodal extension). She also had a history of PTC in her mother. Therefore, she was deemed eligible for adjuvant treatment with 5.55 GBq of RAI. Her stimulated serum TSH, thyroglobulin (Tg) and anti-Tg antibody levels were, >100 mIU/L, 0.4 ng/mL and 415 IU/mL, respectively, using the standard withdrawal protocol [1]. Seven days following RAI

therapy, the post-therapeutic WBIS showed central neck uptake as well as a round iodine-avid area in the mid abdomen, just above the bladder and rectum (Figure 1A, arrow). The patient did not report any history of ongoing menstrual bleeding. Her physical examination revealed a large abdominal mass, which could be easily palpable (Figure 1B, dashed circle). By retrospectively reviewing her gynecologic history and ultrasounds, it was revealed that she had a history of a large uterine fibroid, measuring 16.5 × 14 × 14 cm, which was stable in size until recently. She had been under active observation by a gynecologist, including prior comprehensive work up, which provided reassurance that this mass was indeed a uterine fibroid. The patient had been recommended to undergo excision of her uterine fibroid due to its significant size and for preserving her fertility; however, she had declined the procedure due to apprehensions regarding gynecological intervention. Single-photon emission computed tomography (SPECT)/CT correlation confirmed our suspicion by localizing the RAI uptake to the fibroid (Figure 1C, arrow).

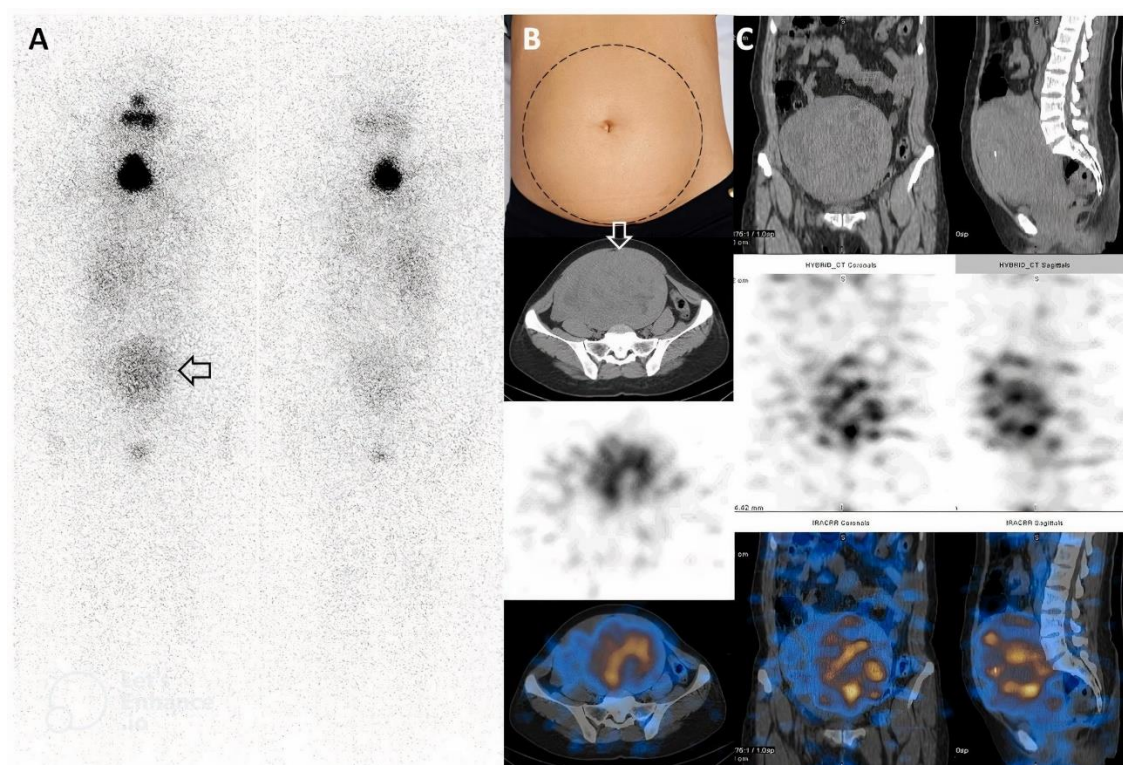


Figure 1. (A) A zone of iodine uptake in the mid abdomen is seen just above the rectum and bladder (arrow). (B) A palpable mass was detected in the lower abdomen on the physical exam (dashed circle). (C) The SPECT/CT images confined the zone of iodine uptake on the WBIS to a large uterine fibroid with smooth peripheral contours and relatively homogenous soft tissue density (arrow). It shows peripheral rim-like FDG uptake and central photopenia, likely suggesting central necrosis. There is enlargement of the right atrium and small pericardial and pleural effusions

DISCUSSION

Fibroids or leiomyomas are the most common benign gynecologic disease [2] and several studies have reported possible association between uterine fibroids and increased incidence of benign and malignant thyroid disorders [3–7]. In the eyes of an experienced reader, uterine fibroids are infrequently mistaken with metastatic thyroid disease. The underlying mechanism for RAI uptake in the fibroids may be due to increased functional sodium iodide symporter expression, metabolism of radio-iodinated thyroid hormone in the uterine wall, compartmental sequestration of RAI in fibroid, presence of inflammatory processes within this area, hyperemia or even contamination by physiologic secretions [8–14]. Moreover, induced aquaporin expression may also affect the RAI uptake in the fibroids due to interactions between surrounding tissues or increased cell membrane permeability with osmolality changes [9, 10]. Although rare, metastatic thyroid cancer with uterine involvement has been also reported [11]. Given the clinical history and prior investigations performed for evaluation of this uterine fibroid, we concluded that it was most likely benign and unrelated to metastatic PTC. However, in case of a newly diagnosed uterine mass, referring to a gynecologist for more in-depth evaluation of the lesion is recommended.

Similar to this case, differential diagnosis for mid-abdominal RAI uptake includes, but not limited to, ovarian lesions (e.g., struma ovarii, mucinous cystadenoma, endometriosis cyst and serous cystadenofibroma), appendix, colonic scar, ectopic kidney, epithelial cyst in mesentery and gestational sac [8, 12, 13]. SPECT/CT is not only useful for better localization of the radiotracer activity, but also extremely helpful to limit the list of possibilities towards more specific diagnosis.

CONCLUSION

Suspicious zones of iodine activity on the WBIS should be localized by additional SPECT/CT imaging for clinical decision-making. Our report underscores the importance of hybrid imaging and also emphasize on the necessity of complete knowledge about benign and physiologic uptakes on WBIS to avoid the unneeded RAI therapy in patients with thyroid cancers.

REFERENCES

1. Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, Pacini F, Randolph GW, Sawka AM, Schlumberger M, Schuff KG, Sherman SI, Sosa JA, Steward DL, Tuttle RM, Wartofsky L. 2015 American

thyroid association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: the american thyroid association guidelines task force on thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016 Jan;26(1):1-133.

2. Stewart EA, Cookson CL, Gandolfo RA, Schulze-Rath R. Epidemiology of uterine fibroids: a systematic review. *BJOG*. 2017 Sep;124(10):1501-12.
3. Spinou N, Terzis G, Crysanthopoulou A, Adonakis G, Markou KB, Vervita V, Koukouras D, Tsapanos V, Decavalas G, Kourounis G, Georgopoulos NA. Increased frequency of thyroid nodules and breast fibroadenomas in women with uterine fibroids. *Thyroid*. 2007 Dec;17(12):1257-9.
4. Braganza MZ, Berrington de González A, Schonfeld SJ, Wentzensen N, Brenner AV, Kitahara CM. Benign breast and gynecologic conditions, reproductive and hormonal factors, and risk of thyroid cancer. *Cancer Prev Res (Phila)*. 2014 Apr;7(4):418-25.
5. Kim MH, Park YR, Lim DJ, Yoon KH, Kang MI, Cha BY, Lee KW, Son HY. The relationship between thyroid nodules and uterine fibroids. *Endocr J*. 2010;57(7):615-21.
6. Sun LM, Chung LM, Lin CL, Kao CH. Uterine Fibroids Increase the Risk of Thyroid Cancer. *Int J Environ Res Public Health*. 2020 May 28;17(11):3821.
7. Guenego A, Mesrine S, Dartois L, Leenhardt L, Clavel-Chapelon F, Kvaskoff M, Boutron-Ruault MC, Bonnet F. Relation between hysterectomy, oophorectomy and the risk of incident differentiated thyroid cancer: The E3N cohort. *Clin Endocrinol (Oxf)*. 2019 Feb;90(2):360-8.
8. Oh JR, Ahn BC. False-positive uptake on radioiodine whole-body scintigraphy: physiologic and pathologic variants unrelated to thyroid cancer. *Am J Nucl Med Mol Imaging*. 2012;2(3):362-85.
9. Teo TY, Menda Y, Mcneely P, Kahn D, Graham M. False-positive radioactive iodine uptake in uterine fibroids. *Clin Med Rev Case Rep*. 2015;2:71.
10. Almohamad FA, Ahmad T, Ahmad B, Hussain K, Hadid L, Zein M, Ahmad M. False-positive radioiodine accumulation in a huge pelvic mass after thyroidectomy for papillary carcinoma, a case report from Syria. *J Surg Case Rep*. 2018 Feb 28;2018(2):rjy028.
11. Benbassat CA, Mechlis-Frith S, Hirsch D. Clinicopathological characteristics and long-term outcome in patients with distant metastases from differentiated thyroid cancer. *World J Surg*. 2006 Jun;30(6):1088-95.
12. Jang HY, Kim BH, Kim WJ, Jeon YK, Kim SS, Kim YK, Kim JJ. False-positive radioiodine uptake in a functional ovarian cyst in a patient treated with total thyroidectomy for papillary cancer. *Intern Med*. 2013 Oct 15;52(20):2321-3.
13. Lazarus JH, Richards AR, MacPherson MJ, Dinnen JS, Williams ED, Owen GM, Wade JS. Struma ovarii: a case report. *Clin Endocrinol (Oxf)*. 1987 Dec;27(6):715-20.
14. Emami-Ardekani A, Amini H, Harsini S, Fard-Esfahani A, Eftekhari M. Unusual false-positive results of whole-body 131I scintigraphy: Four different case scenarios. *Iran J Nucl Med*. 2019;27(2):149-153.