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CASE REPORT

Ectopic thyroid in the background of MNG – diagnosis with SPECT/CT radionuclide scan: a case report

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ABSTRACT

Background: Ectopic thyroid in presence of multinodular goiter is a rare entity. We present case of a patient with a multinodular goiter located in the anterior neck with a separate ectopic thyroid in the submental region.

Case presentation: We describe a 38 year old female who visited nuclear medicine department for thyroid scanning. She underwent total thyroidectomy 28 days back due to MNG (Multinodular goiter) with compressive symptoms. After surgery, she developed a swelling, located in the midline in the upper neck region. Thyroid scanning along with SPECT-CT showed a photon-avid, soft tissue density lesion in the submental region.

Conclusion: Ectopic thyroid in presence of multinodular goiter in native location, is a rare entity. Nevertheless, it may be included in the differential diagnosis in cases where a new swelling appears soon after surgery.

Keywords: Ectopic thyroid, multinodular goiter, case report, scintigraphy.

Background

Ectopic thyroid tissue is a rare congenital anomaly. It may be defined as thyroid tissue located other than its normal place, anterolaterally from the second to the fourth tracheal cartilage. Ectopic thyroid tissue may occur anywhere along the path of descend of the thyroid, during its passage from the floor of the primitive foregut to its final pre-tracheal position at early stages of thyroid gland embryogenesis [1]. Ectopic functioning thyroid tissue is not commonly reported in the presence of MNG (multinodular goiter).

Case presentation

A 38-year-old female presented with complaints of dyspnea and dysphagia with MNG in front of the neck. She was referred to nuclear medicine department, for ^{99m}Tc-pertechnetate scan. Neck scintigraphy revealed multinodular goiter (Figure 1(A)). The patient was euthyroid on hormonal analysis. A Surgeon performed total thyroidectomy due to compressive symptoms. Histopathology showed MNG. On the 28th day after surgery, the patient developed a fairly large swelling in the submental region.

Ultrasonography of the neck showed an ovoid solid nodule, measuring 1.6 × 1.7 cm in submental region. She was again referred for the assessment of the tissue in the newly developed lump by ^{99m}Tc-pertechnetate scan, with the suspicion that the lump may have thyroid tissue in it.

Her planar scan (Figure 1(B)) demonstrated a rounded focus of intense radiotracer uptake in the submental region with minimal uptake in the region of thyroid bed. Single photon emission tomography + X-ray computed tomography (SPECT-CT) imaging showed a pertechnetate-avid focus in front of the neck which was localized as soft tissue density lesion, measuring 1.6 × 1.7 cm in the submental region with minimal residual tissue

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in the thyroid bed (Figure 2). Considering pertechnetate avidity and soft tissue density lesion on noncontrast CT, diagnosis of the ectopic thyroid was made.

At present patient had no complaints of pressure or obstruction in the neck. However, presently the main complaint was swelling in the submental region, increasing gradually in size. As the lesion is photon-avid, one of the treatment options is radioiodine therapy followed by lifelong thyroxin replacement therapy. It would decrease the size of ectopic thyroid swelling by lowering the elevated TSH level as the ectopic tissue is subjected to same goitrogenic stimulation as the normally placed thyroid tissue [2,3].

Hormone production from ectopic thyroid tissue is usually insufficient. High TSH drive caused ectopic thyroid swelling to increase in size and become photon-avid after total thyroidectomy in this particular case [4].

Surgery is usually done if the patient has pressure or obstructive symptoms, or there is suspicion of malignancy in ectopic thyroid tissue.

Review of previous scintigraphic findings revealed an area of minimal radiotracer uptake in the submental region. That was actually masked in the presence of large MNG with markedly nonhomogeneous uptake.

The possibility of ectopic thyroid should be kept in mind and evaluated accordingly even in cases of MNG.

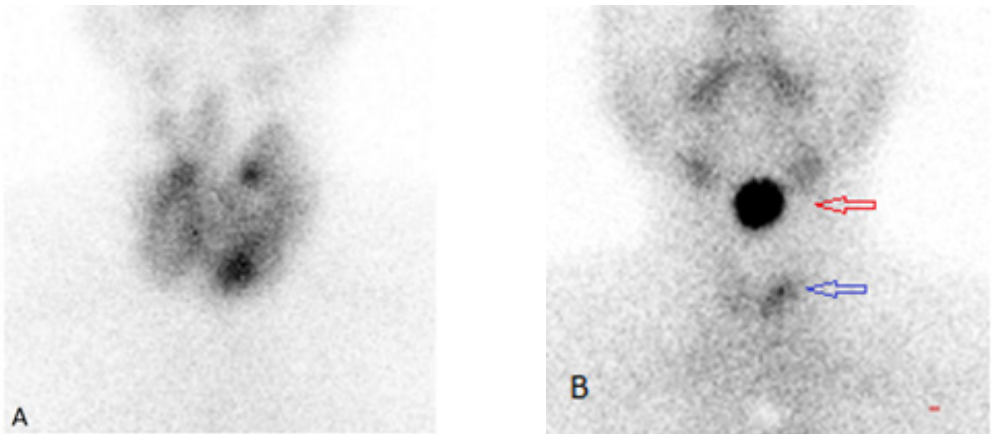

Figure 1: (A) *^{99m}Tc-pertechnetate scan of a 38-year-old female, with MNG, preoperatively,* ***(B)*** *^{99m}Tc-pertechnetate scan after total thyroidectomy demonstrated focus of increased tracer uptake in the submental region (red arrow) with minial residual tissue in the thyroid bed (blue arrow).*

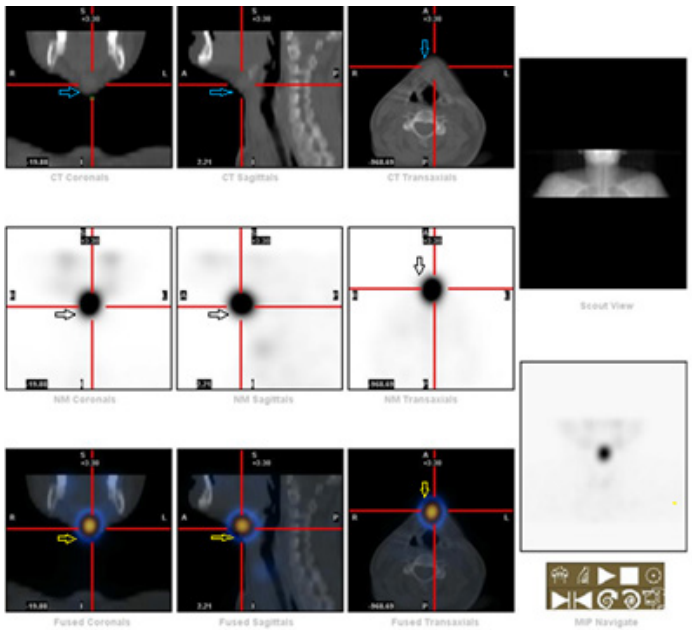

Figure 2: *SPECT-CT images of ^{99m}Tc-pertechnetate scan. The scan localized distinct pertechnetate-avid focus (black arrows) as soft tissues density lesion (blue arrows) measuring 1.6 × 1.7 cm at the submental region.*

Discussion

Ectopic thyroid is the most common form of thyroid dysgenesis [5]. Its incidence is not known yet, however, studies on necropsy suggest that 7-10% of adults can be asymptomatic carriers of thyroid tissue in thyroglossal duct path [6-8]. Ectopic thyroid tissue mostly occurs in the line of descend from the foramen caecum to the mediastinum. [6-9]. It is relatively less common in lateral positions. [9,10]. Most common location is lingual thyroid, accounting 90% of reported cases [5,9-11]. Other sites rarely involved are mediastinum, lungs, porta-hepatis system, duodenum, esophagus, heart, breasts and intratracheal area [9].

The presence of ectopic thyroid tissue in the midline in the submental region in the background of MNG is rarely reported [12,13]. Ectopic thyroid in the submental region with MNG in anterior cervical location is difficult to diagnose preoperatively, as the ectopic tissue can be masked clinically as well as on scintigraphically due to multiple functioning nodules. In the case under discussion, after 28 days of total thyroidectomy high TSH drive caused the swelling to enlarge gradually and become prominent on scintigraphy. The possibility of a recurrent thyroid nodule is excluded on the basis of clinical history and correlative SPECT / CT imaging which revealed that it is located in the submental region. Thyroid scintigraphy is the gold standard for localization of ectopic thyroid tissue. Radiotracer accumulation in normal thyroid area and ectopic thyroid tissue plays a key role in the diagnosis and treatment [14].

Clinically patient presents with a palpable and painless midline cervical mass. It may be associated with hyper or hypo thyroid functioning status [15]. Diseases affecting the normal thyroid gland can also affect the ectopic thyroid tissue [16,17], but benign or malignant neoplastic conditions that affect the ectopic thyroid tissue are very rare [17,18]. Malignant transformation was reported in less than 1% of ectopic thyroids and include all histologic variants with the exception of medullary carcinoma [19,20]. Most common malignancy arising from ectopic thyroid tissue is papillary thyroid carcinoma [21].

The treatment of ectopic thyroid tissue depends upon the symptoms of the patient and the possibility of malignancy. Surgical treatment should be performed when ectopic thyroid in the neck leads to symptoms, such as dysphagia, dysphonia, and dyspnea; and when malignancy cannot be ruled out [14]. However, the risk of malignant transformation in ectopic thyroid tissue is rarely reported in the literature.

Conclusion

Ectopic thyroid tissue should be considered in the diagnosis of a cervical mass, appearing soon after thyroidectomy and even in cases of multinodular goiter in native location. The most appropriate therapeutic option is the surgical resection and pathologic assessment of the swelling because such lesions may harbor primary cancer or metastases of hidden thyroid cancer.

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None

List of Abbreviations

MNG	Multinodular goiter
TSH	Thyroid stimulating hormone
SPECT-CT	Single photon emission computed tomography + X-ray computed tomography

Conflict of Interests
None

Funding
None

Consent for publication
Written informed consent was obtained from the patient to publish this case in a medical journal.

Ethical approval
Ethical approval is not required at our institution for publishing a case report in a medical journal.

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Authors' contribution
FG and MBI were responsible for recognizing the importance of publicizing the lessons of this case to the wider medical community. FG and MBI managed the patient and wrote the draft of the case report. MSA contributed by reviewing the manuscript. All the authors approved the final version of the manuscript.

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References

1. Abellán Galiana P, Cámara Gómez R, Campos Alborg V, Rivas Sánchez A, Salom Fuster JV, Muñoz Gómez C. [Dual ectopic thyroid: subclinical hypothyroidism after extirpation of a submaxillary mass]. Rev Esp Med Nucl. 2009;28:26–9.

2. Agrawal R, Agrawal SR, Gupta DC, Gupta A. Ectopic multinodular Goitre-An unusual case. Indian J Otolaryngol Head Neck Surg. 2005;57:350–2. doi:10.1007/BF02907712.
3. Amoodi HA, Makki F, Taylor M, Trites J, Bullock M, Hart RD. Lateral ectopic thyroid goiter with a normally located thyroid. Thyroid. 2010;20:217–20. doi:10.1089/thy.2008.0410.
4. Babazade F, Mortazavi H, Jalalian H, Shahvali E. Thyroid tissue as a submandibular mass: a case report. J Oral Sci. 2009;51:655–7.
5. Bersaneti JA, Silva RDP, Ramos RRN, de Medeiros Matsushita M, Souto LRM. Ectopic Thyroid Presenting as a Submandibular Mass. Head Neck Pathol. 2010;5:63–6. doi:10.1007/s12105-010-0209-z.
6. Choi J-Y, Kim J-H. A case of an ectopic thyroid gland at the lateral neck masquerading as a metastatic papillary thyroid carcinoma. J Korean Med Sci. 2008;23:548–50. doi:10.3346/jkms.2008.23.3.548.
7. Dalgic A, Gur H, Kandogan T. A Rare Case: Suprahyoid Ectopic Thyroid Tissue. Erciyes Tıp Dergisi/Erciyes Medical Journal. 2015;36:174–6. doi:10.5152/etd.2014.5263.
8. Dalla JS, Foley TP, Sperling MA. Hypothyroidism. Pediatric Endocrinology. 3rd ed., Philadephia: WB Saunders Co; 1996, p. 391–9.
9. Fumarola A, Trimboli P, Cavaliere R, Coletta I, Veltri A, Di Fiore A, et al. Thyroid papillary carcinoma arising in ectopic thyroid tissue within a neck branchial cyst. World J Surg Oncol. 2006;4:24. doi:10.1186/1477-7819-4-24.
10. Huang T-S, Chen H-Y. Dual thyroid ectopia with a normally located pretracheal thyroid gland: case report and literature review. Head Neck. 2007;29:885–8. doi:10.1002/hed.20604.
11. Kousta E, Konstantinidis K, Michalakis C, Vorias M, Sambalis G, Georgiou M, et al. Ectopic thyroid tissue in the lower neck with a coexisting normally located multinodular goiter and brief literature review. Hormones (Athens). 2005;4:231–4.
12. Kousta E, Konstantinidis K, Michalakis C, Vorias M, Sambalis G, Georgiou M, et al. Ectopic thyroid tissue in the lower neck with a coexisting normally located multinodular goiter and brief literature review. Hormones (Athens). 2005;4:231–4.
13. Kuman NK, Sen S, Meteoglu I. Multiple Thyroid Ectopia with a Normally Located Tyroid: Can It be a Hereditary Disorder? Journal of Advances in Medical and Pharmaceutical Sciences. 2015;4:1–5.
14. Ling L, Zhou S, Wang S, Wang L. Misdiagnosed ectopic thyroid carcinoma: report of two cases. Chin Med J. 2004;117:1588–9.
15. Mace ATM, McLaughlin I, Gibson IW, Clark LJ. Benign ectopic submandibular thyroid with a normotopic multinodular goitre. J Laryngol Otol. 2003;117:739–40. doi:10.1258/002221503322334648.
16. Matsumoto K, Watanabe Y, Asano G. Thyroid papillary carcinoma arising in ectopic thyroid tissue within a branchial cleft cyst. Pathol Int. 1999;49:444–6.
17. Nasiru Akanmu I, Mobolaji Adewale O. Lateral cervical ectopic thyroid masses with eutopic multinodular goiter: an unusual presentation. Hormones (Athens). 2009;8:150–3.
18. Nasiru Akanmu I, Mobolaji Adewale O. Lateral cervical ectopic thyroid masses with eutopic multinodular goiter: an unusual presentation. Hormones (Athens). 2009;8:150–3.
19. Rovet JF. Children with congenital hypothyroidism and their siblings: do they really differ? Pediatrics. 2005;115:e52-57. doi:10.1542/peds.2004-1492.
20. Sood A, Seam RK, Gupta M, Raj Sharma D, Bhardwaj P. Dual Ectopic Thyroid: A Case Report with Review of Literature. Iran J Radiol. 2011;8:29–32.
21. Wong RJ, Cunningham MJ, Curtin HD. Cervical ectopic thyroid. Am J Otolaryngol. 1998;19:397–400.

Summary of the case

Patient (gender, age)	1	Female, 38 year old
Final Diagnosis	2	Ectopic thyroid in the submental region with multinodular goiter in native location
Symptoms	3	Neck swelling
Medications (Generic)	4	NA
Clinical Procedure	5	^{99m}Tc-pertechnetate scan
Specialty	6	Nuclear Medicine
Objective	7	To find out the nature of swelling appearing soon after surgery
Background	8	Young female with neck swelling appearing soon after thyroidectomy for MNG
Case Report	9	Ectopic thyroid in the background of MNG in native location
Conclusions	10	Ectopic thyroid should be included in the differential diagnosis in cases where a new swelling appears soon after thyroid surgery.
MeSH Keywords	11	Ectopic thyroid, multinodular goiter, case report, scintigraphy