CASE REPORT

Neck schwannoma diagnosed by core needle biopsy: a case report

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Abstract Here we present a case of a 58 year old man referred to our hospital to undergo neck and thyroid ultrasonography (US) following palpable neck mass. US revealed a solid hypoechoic nodule in right thyroid lobe, and a solid lesion on the right laterocervical neck region with ultrasound suspicious features of neoplastic lymph node. In order to achieve a diagnosis of the neck mass and to get a proper evaluation of the thyroid nodule, we decided to perform a fine-needle aspiration (FNA) of both lesions. At cytopathologic examination the thyroid nodule appeared as benign, while cytologic sampling of the neck lesion was inadequate for a proper evaluation. Thus, we performed core needle biopsy (CNB) of the neck lesion like recently proposed for thyroid lesions; also, to definitively exclude malignancy of thyroid nodule, this also underwent CNB. Histologic report of CNB confirmed benign thyroid nodule, while the neck lesion revealed a proliferation of neuronal type consistent with schwannoma. The patient has been addressed to clinical and ultrasonographic follow-up. CNB appears as a safe and minimally-invasive approach to diagnose indeterminate neck masses and avoid unnecessary diagnostic surgery.

Riassunto Presentiamo il caso di un uomo di 58 anni che si sottoponeva ad ecotomografia del collo per una massa palpabile in sede laterocervicale destra. L'esame ecotomografico ha mostrato la presenza di una lesione solida nella regione laterocervicale destra del collo, con caratteristiche ecografiche sospette per linfonodo neoplastico. Contestualmente, si riscontrava un nodulo solido ipoecogeno del lobo destro della tiroide. Allo scopo di un'ulteriore definizione diagnostica, si è pertanto deciso di procedere ad esecuzione di agoaspirato ecoguidato di entrambe le lesioni, inviando per esame citologico il materiale ottenuto. Il nodulo tiroideo ha mostrato caratteri di benignità, mentre il prelievo eseguito sulla formazione del collo non è apparso adeguato per la valutazione citologica. Abbiamo così deciso di procedere a *core needle biopsy* della lesione del collo, eseguendo la medesima procedura anche sul nodulo tiroideo, per una conferma diagnostica. L'esame istologico ha confermato la benignità del nodulo tiroideo e la lesione del collo è risultata una proliferazione di tipo neuronale compatibile con schwannoma. Il paziente è stato quindi indirizzato a follow-up clinico ed ecografico. In conclusione, nel caso clinico da noi presentato la *core needle biopsy* è apparsa una procedura sicura e mini-invasiva nell'inquadramento diagnostico di una massa del collo di incerto significato all'esame ecotomografico, senza necessità di ulteriori approcci chirurgici.

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Case report

A 58 year old man was referred to our hospital to undergo neck and thyroid ultrasound examination (US) due to a recently discovered palpable neck mass. The patient was in good general health, and no relevant anamnestic details were recorded. A blood sampling for thyrotropin, free-T4,

Fig. 1 Ultrasound presentation of the neck mass

calcitonin and anti-thyroid antibodies showed values within the reference ranges. US revealed a solid hypoechoic thyroid nodules in the right lobe, appearing with peripheral flow at Color Doppler signal. Concomitant US of the neck identified a lesion on the right middle latero-cervical region. It appeared as a 2-cm round hypoechoic lesion, homogeneous in its aspect, with regular margins and with no increased signal at Color and Power Doppler evaluation. In particular, no hilar vascularity consistent with reactive lymph node [1] was detected (Fig. 1a).

In order to achieve a diagnosis of the neck lesion and to get a proper evaluation of the thyroid nodule, we decided to perform a fine-needle aspiration (FNA) of the pericentimetric lesion of the right thyroid lobe. Also, to exclude a metastatic lymph node from occult thyroid cancer, FNA was performed on the neck lesion with cytologic examination and thyroglobulin and calcitonin measurement in washout fluids of the needle after aspiration [2–4] using 23-gauge needles in ultrasound-guided freehand technique. At cytopathologic examination the thyroid nodule appeared as benign (Thy 2). Cytologic specimens of the neck lesion had inadequate report, while thyroglobulin and calcitonin in washout fluids were undetectable and excluded metastasis from thyroid [2, 3]. Thus, we decided to perform a core needle biopsy (CNB) of the neck mass. After administration of local anesthesia by mepivacain 1 % mL, a 21-gauge modified Menghini cutting needle (Biomol®, Hospital Service, Rome, Italy) was percutaneously introduced under ultrasound guide in freehand fashion, as recently described for thyroid lesions [5] (Fig. 1b). CNB

Fig. 2 Histology of the schwannoma of the lateral neck

was also performed in thyroid nodule to avoid the possibility of false negative results at FNA [6]. All core samples were formalin-fixed. No complications occurred and the patient was discharged three hours later. Histopathologic results of the thyroid nodule fitted with cytopathologic findings, confirming benignancy. The histologic examination of the neck lesion revealed a mesenchymal proliferation of neuronal type, without cellular atypia nor mitotic activity. The immunohistochemical panel was negative for Galectin-3, HBME-1, Cytokeratin-19, and positive for S100 protein, consistent with schwannoma (Fig. 2). These findings allowed to avoid diagnostic surgery and patient has been addressed to clinical and ultrasonographic follow-up.

Discussion

Thyroid carcinoma, especially the papillary type, most often metastasizes to cervical lymph nodes [3] and it is not uncommon to find thyroid cancer metastatic neck lesions at the time of disease presentation even when the primary tumor is small and intrathyroidal. Such metastatic neck lesions are up to 20–50 % in thyroid papillary carcinoma [7]. Over the last decades, FNA for cytopathological evaluation of thyroid lesions proved to be a reliable tool, recommended by current guidelines [7]. Besides, cervical lymph nodes are also related to non-head and neck metastatic cancer or even to tuberculous lymphadenitis or other benign lymphadenitis, such as Kikuchi's disease, Kimura's disease, and Rosai–Dorfman disease [1, 3, 8].

Several US aspects have been described as useful features in differentiating between benign and malignant neck lymphadenopathy [9] and US coupled with FNA has been described as ideal first approach investigation in distinguishing between lymphomatous and metastatic neck

lymph nodes from thyroid cancer. On the other hand, peripheral nerve sheath tumors are common neoplasms but they can be diagnostically challenging on occasions, and controversies about their classification and grading still persist, along with the primary debate about benignancy versus malignancy [10]. Nevertheless, the role of FNA in soft tissue tumors and tumor-like lesions remains controversial [11] with a non-negligible rate of unsatisfactory samples [12].

CNB performed by 14-gauge tru-cut trocar has been proposed and some retrospective studies compared its role to FNA [12] with the conclusion that CNB appeared to be useful in case of non-diagnosing samplings. More recently, a paper by Kasraejan et al. [13] showed the results of a prospective study focused on extremity soft tissue tumors, summarizing that CNB had a bigger sensitivity, specificity, predictive value and accuracy than FNA in determining malignancy, but still appearing inferior to open surgical biopsy, which in the paper has been considered worthwhile whenever possible. The major limit of CNB in neck mass resides in heterogeneity of mesenchymal tumors, so large lesions may result not adequately sampled by thin core needle. On the other hand CNB is informative in a great number of cases and it was recommended as diagnostic strategy for neck masses in international guidelines [14]. With relation to the case report we are presenting, some aspects can be of interest concerning the role of CNB. Firstly, it helped us to rule out a possible metastatic thyroid disease which would have driven to completely different diagnostic and therapeutic choices, with no preliminary open surgical biopsy of the lymph node needed, provided it had been adequately evaluated by CNB. Besides, CNB of the neck lesion was performed by a 21-gauge needle, which in other papers concerning thyroid biopsy proved to have a good tolerability by patients [15], with low complication rates [5]. Focusing on soft tissue tumors, in our opinion more studies would be necessary in order to establish the proper role of CNB within the diagnostic work-up [16]. For example, CNB could be of value in patients with unsatisfactory FNA not eligible to radical surgery, in order to get the most accurate minimally-invasive histological and immunoistochemical characterization to address the therapy. Nevertheless, in the case we are presenting, CNB acted as a minimally-invasive, safe, not expensive procedure able to prove benignancy of the neck lesion, thus allowing for a follow-up programme.

Conclusions

The role of CNB in soft tissue tumors has not been completely defined yet. In our opinion, the use of a 21-gauge needle for CNB procedures can have a role in reducing morbidity. Based on the herein case report, CNB looks a

safe and minimally-invasive approach to indeterminate or suspicious neck mass, and allows to avoid diagnostic surgery of benign lesions.

Conflict of interest All the authors—Nasrollah N, Trimboli P, Bianchi D, Taccogna S—declare that they have no conflict of interests.

Informed consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. All patients provided written informed consent to enrolment in the study and to the inclusion in this article of information that could potentially lead to their identification.

Human and animal studies The study was conducted in accordance with all institutional and national guidelines for the care and use of laboratory animals.

References

1. Ahuj AT and Ying M (2005) Sonographic evaluation of cervical lymph nodes. *Am J Roentgenol* 184:1691–1699
2. Trimboli P, Cremonini N, Ceriani L, Saggiorato E, Guidobaldi L, Romanelli F, Ventura C, Laurenti O, Messuti I, Solaroli E, Madaio R, Bongiovanni M, Orlandi F, Crescenzi A, Valabrega S, Giovannella L (2014) Calcitonin measurement in aspiration needle washout fluids has higher sensitivity than cytology in detecting medullary thyroid cancer: a retrospective multicentre study. *Clin Endocrinol (Oxf)* 80:135–140
3. Giovannella L, Bongiovanni M, Trimboli P (2013) Diagnostic value of thyroglobulin assay in cervical lymph node fine-needle aspirations for metastatic differentiated thyroid cancer. *Curr Opin Oncol* 25:6–13
4. Ahuja A, Ying M, Yang WT, Evans R, King W, Metreweli C (1996) The use of sonography in differentiating cervical lymphomatous lymph nodes from cervical metastatic lymph nodes. *Clin Radiol* 51:186–190
5. Nasrollah N, Trimboli P, Guidobaldi L, Ciciarella Modica DD, Ventura C, Ramacciato G, Taccogna S, Romanelli F, Valabrega S, Crescenzi A (2013) Thin core biopsy should help to discriminate thyroid nodules cytologically classified as indeterminate. A new sampling technique. *Endocrine* 43(3):659–665
6. Sinna EA, Ezzat N (2012) Diagnostic accuracy of fine needle aspiration cytology in thyroid lesions. *J Egypt Natl Canc Inst* 24:63–70
7. American Thyroid Association (2009) (ATA) Guidelines Task-force on Thyroid Nodules and Differentiated Thyroid Cancer, Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, Mazzaferri EL, McIver B, Pacini F, Schlumberger M, Sherman SI, Steward DL, Tuttle. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 19:1167–1214
8. Ying M, Ahuja AT, Evans R, King W, Metreweli C (1998) Cervical lymphadenopathy: sonographic differentiation between tuberculous nodes and nodal metastases from non-head and neck carcinomas. *J Clin Ultrasound* 26:383–389
9. Trimboli P, Guglielmi R, Monti S, Misischi I, Graziano F, Nasrollah N, Amendola S, Morgante SN, Deiana MG, Valabrega S, Toscano V, Papini E (2012) Ultrasound sensitivity for thyroid malignancy is increased by real-time elastography: a prospective multicenter study. *J Clin Endocrinol Metab* 97:4524–4530
10. Rodriguez FJ, Folpe AL, Giannini C, Perry A (2012) Pathology of peripheral nerve sheath tumors: diagnostic overview and

- update on selected diagnostic problems. *Acta Neuropathol* 123:295–319
11. Hirachand S, Lakhey M, Singha AK, Devkota S, Akhter J (2007) Fine needle aspiration (FNA) of soft tissue tumours (STT). *Kathmandu Univ Med J (KUMJ)* 5(3):374–377
 12. Bennert KW, Abdul-Karim FW (1994) Fine needle aspiration cytology vs. needle core biopsy of soft tissue tumors. A comparison. *Acta Cytol* 38:381–384
 13. Kasraeian S, Allison DC, Ahlmann ER, Fedenko AN, Menendez LR (2010) A comparison of fine-needle aspiration, core biopsy, and surgical biopsy in the diagnosis of extremity soft tissue masses. *Clin Orthop Relat Res* 468:2992–3002
 14. Gharib H, Papini E, Paschke R, Duick DS, Valcavi R, Hegedüs L, Vitti P; AACE/AME/ETA Task Force on Thyroid Nodules. Collaborators: Tseleni Balafouta S, Baloch Z, Crescenzi A, Dralle H, Gärtner R, Guglielmi R, Mechanick JJ, Reinert C, Szabolcs I, Zeiger MA, Zini M (2010) American Association of Clinical Endocrinologists, Associazione Medici Endocrinologi, and European Thyroid Association medical guidelines for clinical practice for the diagnosis and management of thyroid nodules. *J Endocrinol Investig* 33(5 Suppl):1–50
 15. Nasrollah N, Trimboli P, Rossi F, Amendola S, Guidobaldi L, Ventura C, Maglio R, Nigri G, Romanelli F, Valabrega S, Crescenzi A (2014) Patient's comfort with and tolerability of thyroid core needle biopsy. *Endocrine* 45:79–83
 16. Yamashita Y, Kurokawa H, Takeda S, Fukuyama H, Takahashi T (2002) Preoperative histologic assessment of head and neck lesions using cutting needle biopsy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 93:528–533