



Ultrasound guided fine-needle aspiration biopsy of thyroid nodules: Guidelines and recommendations vs clinical practice; a 12-month study of 89 patients

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KEYWORDS

Thyroid nodules;
Ultrasound;
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Abstract *Introduction:* Given the high prevalence of thyroid nodules in the general population it is essential to develop a method for identifying those nodules which require fine-needle aspiration biopsy (FNAB) due to suspicion for malignancy in order to avoid over- or under treatment of this disease. The ultrasound (US) criteria identified by Kim et al. and the American Association of Clinical Endocrinologists appear to be the most sensitive and most specific. The purpose of this study was to analyze a sample of patients who underwent FNAB of the thyroid and to compare the obtained data with the international guidelines and the recommendations for management of thyroid nodules.

Materials and methods: This study analyzed the clinical, anamnestic and US reasons for which 97 nodules located in 89 patients underwent FNAB, and the data were compared with the criteria set by the guidelines and with the cytological results.

Results: Echogenicity was indication for FNAB in 99% of cases, appearance of the margins in 75.3%, presence of calcifications in 93.8% and presence of vascularity in 73.2%. In a total of 4.1% of cases, cytological outcome was positive for malignancy, 21.6% necessitated monitoring, 4.1% were referred to surgery and histological examination of the surgical specimen and 63.9% resulted negative for malignancy.

Discussion: The finding of hypoechoic nodules often leads to continued investigation; the presence of intranodular vascularization detected at Doppler US is perceived as suspicious and the presence of microcalcifications always leads to further investigation. On the request of the endocrinologist the dominant nodule in a goiter is in most cases subjected to FNAB even if the volume has not increased. Adequate US criteria can help identify potentially malignant nodules and guide implementation of FNAB. However, identification of malignant nodules using instrumental investigation cannot disregard medical records and clinical laboratory tests. According to the authors' experience, a close collaboration between endocrinologists, radiologists and pathologists is essential for a correct evaluation of patients with thyroid nodules in

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order to avoid over or under estimation of the risk of malignancy of a nodule and therefore of the necessity to perform further examinations.

Sommario *Introduzione:* Data l'elevata prevalenza di noduli tiroidei nella popolazione generale è indispensabile un metodo di individuazione dei noduli sospetti per neoplasia da sottoporre an FNAB per evitare un sovra o sotto trattamento della patologia. I criteri ecografici individuati da Dizionario - Visualizza dizionario dettaglKim et al e dall'American Association of Clinical Endocrinologists risultano essere rispettivamente i più sensibili e più specifici.

Lo scopo dello studio è di analizzare un campione di pazienti sottoposti a biopsia tiroidea con ago sottile (Fine-Needle Aspiration Biopsy - FNAB) e verificare quanto nella pratica clinica si faccia riferimento alle linee guida.

Materiali e metodi: Sono state analizzate le motivazioni clinico-anamnestiche e/o ecografiche per cui 97 (in 89 pazienti) noduli sono stati sottoposti FNAB; i dati sono stati confrontati con i criteri indicati dalle linee guida ed con i risultati citologici.

Risultati: L'ecogenicità era indicata nel 99% dei casi, l'aspetto dei margini nel 75.3%, la presenza di calcificazioni nel 93.8%, la presenza di vascolarizzazione nel 73.2%. Il 4.1% dei noduli punti è risultato positivo per neoplasia, il 21.6% da monitorare, il 4.1% da sottoporre ad esame istologico (su pezzo chirurgico) ed il 63.9% negativo.

Discussione: Il nodulo ipoecogeno induce spesso alla prosecuzione degli accertamenti; la presenza di vascolarizzazione al Doppler viene percepita come sospetta; la presenza di microcalcificazioni dà sempre seguito ad accertamenti ulteriori. Il nodulo prevalente in uno struma viene sottoposto an FNAB anche in molti casi in cui non ha subito crescita, in base a specifica richiesta endocrinologica.

I criteri ecografici consentono di identificare i noduli potenzialmente maligni e di orientare l'esecuzione di FNAB; l'identificazione di noduli maligni con esami strumentali non può prescindere dai dati anamnestici e clinico-laboratoristici. Quindi, anche in base alla nostra esperienza, è fondamentale la collaborazione tra endocrinologi, radiologi ed anatomo-patologi per una corretta valutazione del paziente con noduli tiroidei al fine di evitare sovra o sottostima del rischio di malignità di un nodulo e dunque della necessità o meno di eseguire esami di approfondimento.

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Introduction

Thyroid cancer (Table 1) accounts for only 1% of all malignancies [1,2]. About 3%–8% of nodules are palpable and 20%–70% are detected at US examination; the overall risk of malignancy is 5%–13% [3] so a consistent diagnostic approach to patients with thyroid nodules is essential to avoid the risk of over or under treatment. The most appropriate diagnostic procedures such as ultrasound (US) examination, cytological examination and scintigraphy are carried out on the basis of the patient's clinical history, physical examination and biochemical data (TSH, free thyroxine, calcitonin, antibodies, etc.)

Fine-Needle Aspiration Biopsy (FNAB) has proved to be an accurate procedure in the diagnosis of thyroid neoplasm [1] with the exception of follicular thyroid lesions where diagnosis requires evaluation of vascular and capsular invasion to be performed on a histological specimen [2]. The most recent guidelines were published by *The American Thyroid Association* (ATA) in 2009 [4] and by the *American Association of Clinical Endocrinologists* (AACE), the *Italian Association of Medical Endocrinologists* (AME) and the *European Thyroid Association* (ETA) in 2010 [5] including a revision published in 2011 [6].

The ATA guidelines [4] recommend US examination in all patients with palpable nodules and with nodules detected incidentally in the course of other investigations and FNAB in all suspicious nodules measuring > 5 mm (grade A recommendation). The AACE/AME/ETA guidelines recommend US examination in all patients with palpable nodules or patients at risk and FNAB also of nodules <10 mm if the clinical and/or US appearance arouse suspicion.

Comparative studies have suggested that the most useful US criteria are those proposed by Kim et al. [7], the AACE [5] and the *Society of Radiologists in Ultrasound* [8]. Comparison of the three sets of guidelines showed that the criteria proposed by Kim et al reached the highest sensitivity, that those proposed by AACE presented the highest specificity (Table 2) and that these two sets of criteria were more accurate than the criteria published by the *Society of Radiologists in Ultrasound* [9]. Comparison of US findings can guide the differential diagnosis (Table 3). The purpose of this paper was to analyze a sample of patients who underwent FNAB, evaluate the characteristics of the nodules and, if possible, the clinical motivation for the performance of FNAB, comparing the data obtained in our daily practice with the guidelines and the recommendations of the leading associations of endocrinology.

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