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ORIGINAL REPORT

Usefulness of ultrasonography is the evaluation of thyroid nodules☆

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Thyroid nodule;
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Abstract
Objective: To evaluate the diagnostic capacity of ultrasonography (US) for differentiating between malignant and benign thyroid nodules and its usefulness in obviating unnecessary invasive procedures.
Patients and methods: From January 2012 through December 2014, a total of 321 fine-needle aspiration biopsy (FNAB) procedures were done in 302 patients selected according to the criteria recommended by the American Association of Clinical Endocrinology guidelines and the American Thyroid Association guidelines. We analyzed the following characteristics on US: location, size, morphology, contour, consistency, echostructure, echogenicity, calcifications, and vascularization. We used univariate and multivariate analyses to investigate the relationship between the US findings and thyroid cancer.
Results: The prevalence of malignancy in our study population was 5.92%. The US findings that were significantly associated with a greater probability of malignancy were microcalcifications, central vascularization, and hypoechogenicity. The US findings that were associated with a lower risk of malignancy were areas of colloid degeneration and nodule heterogeneity.
Conclusion: Our results suggest that decisions about whether to perform FNAB should be based on the presence of suspicious US findings found with our statistic model rather than on the size of the nodule. Thus, unnecessary FNAB procedures on nodules without suspicious US characteristics can be avoided.

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PALABRAS CLAVE
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Utilidad de la ecografía en la evaluación de los nódulos tiroideos

Resumen
Objetivo: Evaluar la capacidad diagnóstica de la ecografía para diferenciar nódulos tiroideos benignos y malignos, y su utilidad para evitar procedimientos invasivos innecesarios.
Pacientes y métodos: De enero de 2012 a diciembre de 2014 se realizaron 321 procedimientos de punción-aspiración con aguja fina (PAAF) a 302 pacientes remitidos por el Servicio de Endocrinología del Centro Medico de Especialidades, seleccionados bajo los criterios de la Guía de la Asociación Americana de Endocrinología Clínica y de la Guía de la Asociación Americana del Tiroides. Se analizaron las siguientes características ecográficas: localización, tamaño, morfología, contorno, consistencia, ecoestructura, ecogenicidad, calcificaciones y vascularización. Se realizó un análisis univariante y multivariante para investigar la relación entre los hallazgos ecográficos y el cáncer de tiroides.
Resultados: La prevalencia de malignidad en nuestra población de estudio es del 5.92%. Los hallazgos ecográficos que son estadísticamente significativos y están asociados a una mayor probabilidad de malignidad son la presencia de microcalcificaciones, la vascularización central y la hipoecogenicidad. Los hallazgos asociados a un menor riesgo son la presencia de halo, la existencia de áreas de degeneración coloide y la heterogeneidad de los nódulos.
Conclusión: Según nuestro estudio, la indicación de realizar PAAF no debería basarse en el tamaño del nódulo, sino en la presencia de hallazgos ecográficos sospechosos de malignidad de acuerdo con las estimaciones de nuestro modelo estadístico. De esta forma sugerimos evitar realizar PAAF innecesarias en nódulos que no presenten dichas características.

Introduction

Neck ultrasound is the diagnostic modality of choice and it is widely used in thyroid conditions. It is estimated that its use could show the existence of thyroid nodules in up to 67 per cent of the population of which approximately 5 per cent[1] would be malignant. Ultrasound plays an essential role in thyroid evaluation, since it allows us to calculate its size distinguishing between (single or multiple) nodules and diffuse affectation with or without nodules. However though attempts have been made to determine what ultrasound characteristics distinguish malignant from benign nodules nowadays there is no consensus on which lesions should be biopsied. There are several practice guidelines for thyroid nodule management that suggest different strategies, but it is necessary to unify criteria.[2] Given this problem it must be established what ultrasound findings indicate that the nodule is malignant or benign with an acceptable predictive value so in order to be able to decide and prioritize what nodules will undergo fine needle aspiration (FNA), because yet despite the fact that this is the best modality to distinguish benignity from malignancy, given its high sensitivity and specificity, it is an invasive procedure that does not provide immediate information and is subject to the uncertainties and errors of both sampling and analysis.[1,3,4]

The goals of this study are to analyze the diagnostic capacity of ultrasound to distinguish benign from malignant thyroid nodules, determine which individual or associated ultrasound findings can be considered high-risk factors of malignancy, and assess its utility to avoid unnecessary invasive procedures.

Material and methods

We expressly declare our adherence to the Helsinki declaration and that the necessary written informed consents have been obtained to carry out all patients' examinations.

Patients

This retrospective, observational study included 302 patients evaluated between January 2012 and December 2014, with a total of 321 thyroid nodules diagnosed, of which 263 corresponded to women, with an average age of 57 years (range: 21–87 years), and 58 corresponded to men, whose average age was 59 years (range: 23–79 years). The study included all patients referred by the Endocrinology Unit of the Specialties Medical Center, during the above-mentioned three year-period, for the performance of thyroid FNPA (fine needle puncture aspirations) selected following the criteria of the American Association of Clinical Endocrinology Guidelines and the last iteration of the American Thyroid Guidelines[5–7] which recommend performing biopsies:

- Nodules larger than 1 cm with a high-suspicion ultrasound pattern, whose estimated malignancy risk is greater than 70–90 per cent, including solid hypoechoic nodules or with a partial cystic component, with one or more of the following ultrasound characteristics: irregular (infiltrating, spiculated or microlobulated) borders, microcalcifications, taller-than-wider shape, ring calcifications interrupted by a small component of hypoechoic soft parts and evidence of extra-thyroid expansion.