SEEN
Sociedad Española de
Endocrinología y Nutrición

sed
SOCIEDAD ESPAÑOLA DE DIABETES

Endocrinología, Diabetes y Nutrición

www.elsevier.es/endo

EDN
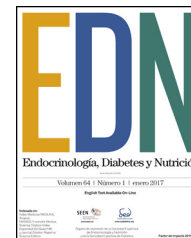Endocrinología, Diabetes y Nutrición

ORIGINAL ARTICLE

Learning curve of thyroid fine-needle aspiration biopsy[☆]

Manuel Penín[a,*], **M. Ángeles Martín**[b], **Beatriz San Millán**[a], **Juana García**[a]

[a] Servicio de Endocrinología y Nutrición, Complexo Hospitalario Universitario, Vigo, Spain
[b] Servicio de Endocrinología y Nutrición, Complejo Asistencial de Zamora, Hospital Virgen de la Concha, Zamora, Spain

Abstract
Background: Fine-needle aspiration biopsy (FNAB) is the reference procedure for thyroid nodule evaluation. Its main limitations are inadequate samples, which should be less than 20%.
Objective: To analyze the learning curve of the procedure by comparing the results of a non-experienced endocrinologist (endocrinologist 2) to those of an experienced one (endocrinologist 1).
Material and methods: Sixty FNABs were analyzed from February to June 2016. Each endocrinologist made 2 punctures of every nodule in a random order. This order and the professional making every puncture were unknown to the pathologist who examined the samples.
Results: Endocrinologist 1 had a higher percentage of diagnoses than endocrinologist 2 (82% vs. 72%, $p = 0.015$). In the first 20 FNABs, the difference between both physicians was remarkable and statistically significant (80% vs. 50%, $p = 0.047$). In the following 20 FNABs, the difference narrowed and was not statistically significant (90% vs. 65%, $p = 0.058$). In the final 20 FNABs, the difference was minimal and not statistically significant (75% vs. 70%, $p = 0.723$).
Conclusions: The learning curve of ultrasound-guided FNAB may be completed in a suitable environment by performing it at least 60 times. Although the guidelines recommend at least 3 punctures per nodule, 2 are enough to achieve an accurate percentage of diagnoses.
© 2017 SEEN and SED. Published by Elsevier España, S.L.U. All rights reserved.

PALABRAS CLAVE
Tiroides;
PAAF;
Punción aspiración
con aguja fina;
Curva de aprendizaje

Curva de aprendizaje de la punción aspiración con aguja fina de tiroides

Resumen

Introducción: La punción-aspiración con aguja fina (PAAF) es la técnica de referencia en la evaluación de los pacientes con nódulos tiroideos. Su mayor limitación son las muestras inadecuadas, que deberían ser menos del 20% de los casos.

Objetivo: Analizar la curva de aprendizaje de dicha técnica de un endocrinólogo sin experiencia (endocrinólogo 2), comparando sus resultados con los obtenidos en los mismos nódulos por un colega experimentado (endocrinólogo 1).

Material y métodos: Se realizaron 60 PAAF entre los meses de febrero y junio de 2016. Cada endocrinólogo realizó 2 punciones de cada nódulo en un orden establecido aleatorizadamente. El orden de las punciones y el endocrinólogo que las realizaba eran datos desconocidos para la patóloga que analizó las muestras.

Resultados: En el total de las PAAF, el endocrinólogo 1 tuvo un porcentaje de diagnósticos significativamente superior al endocrinólogo 2 (82 vs. 72%; p = 0,015). En las primeras 20 PAAF la diferencia entre ambos fue notable y estadísticamente significativa (80 vs. 50%; p = 0,047). En las siguientes 20 PAAF la diferencia se redujo y ya no tenía significación estadística (90 vs. 65%; p = 0,058). Y en las últimas 20 la diferencia fue mínima y sin significación estadística (75 vs. 70%; p = 0,723).

Conclusiones: La curva de aprendizaje de la eco-PAAF puede completarse en un entorno adecuado haciéndola un mínimo de 60 veces. Aunque las guías recomiendan al menos 3 punciones por nódulo, 2 son suficientes para conseguir un porcentaje adecuado de diagnósticos.

Introduction

Fine-needle aspiration biopsy (FNAB) is the reference procedure for assessing patients with thyroid nodules. Initially described in 1934,[1] its use became generalized after the favorable publications of Walfish[2] and Gershengorn.[3] Described in detail in numerous texts,[4–7] all of its variants have in common that three to six punctures are performed[8,9] with a 22 to 27 G needle to obtain at least six groups of 10 follicular cells,[10,11] the characteristics of which are analyzed microscopically.

The greatest limitation of FNAB are inadequate samples, which in expert hands occur in 2–20% of cases,[12] although some authors suggest a more realistic rate of 15–25%.[13] This continues to occur despite improvements that have reduced their incidence, such as use of ultrasound in its performance,[14,15] standardization of different aspects of the procedure, including smear number and preparation,[16] needle size[17] and rinsing of the remnants. The presence of a pathologist who observes the samples at the site of puncture may also decrease this percentage.[18]

The learning curve of a procedure is the number of times it has to be performed until an adequate number of successes are achieved. Little is known about this curve in the case of FNAB: most of the few existing publications analyze improvements in the results of professionals with proven prior experience[19,20] or who perform at the same time as FNAB aspiration of extrathyroid nodules[21]; or procedures far from the standard, such as computed tomography-guided thyroid aspiration.[22]

This was a prospective study to analyze the learning curve of FNAB of an endocrinologist with no experience, comparing his/her results to those obtained in the same nodules by an experienced colleague.

Patients and methods

The Department of Endocrinology and Nutrition of the Complexo Hospitalario Universitario de Vigo has a weekly clinic that lists patients for whom FNAB is requested. Punctures are performed by an endocrinologist with 21 years of experience in the procedure. During the study period, an endocrinologist with no experience in performing FNAB also attended the procedure.

The punctures analyzed in this study were performed during eight clinic working days from 4 February to 30 June 2016. Patients were recruited through the hospital appointment service by order of request, and none of the authors knew these patients or the characteristics of their nodules until the day FNAB was performed.

Before performing the punctures analyzed, the more experienced endocrinologist (endocrinologist 1) performed complete FNABs on four patients and explained in detail to his colleague (endocrinologist 2) the characteristics of the procedure, divided into three parts: aspects prior to the puncture (patient placement, use of ultrasound equipment, marking of the puncture site, etc.), puncture method (angle of entry of the needle into the skin, visualization of the needle in ultrasound equipment, aspiration method) and post-aspiration issues (smearing of samples, rinsing of remnants from the needle, fixation).

Each endocrinologist performed two punctures of each nodule under ultrasound control in a randomly established order and following the procedure described in a previous