

Congresso Interregionale AME

Matera, 9 Maggio 2014

US-guided Thin Core-Needle Biopsy: What is its role?

Enrico Papini

Department of Endocrinology & Metabolism
Regina Apostolorum Hospital

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

**Most persistently nondiagnostic solid nodules
should be surgically excised**

7.6.I. Nodules Nondiagnostic by FNA Biopsy (Class I)

- If initial FNA biopsy is nondiagnostic, it should be repeated with US guidance (Grade B; BEL 3)
- Most persistently nondiagnostic solid nodules should be surgically excised (Grade C; BEL 4)
- CNB may offer additional information in thyroid lesions with inadequate cytologic results of FNA biopsy (Grade C; BEL 3)

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- “Indeterminate” nodules: repeat FNA not recommended
- CNB: not recommended
- Molecular markers: not recommended for routine

7.6.3. Follicular Lesions (Class 3)

7.6.3.1. Management

- Repeated FNA biopsy of follicular lesions is not recommended because it does not provide additional information (**Grade C; BEL 3**)
- CNB is not recommended in the management of follicular lesions because it does not add additional information to FNA biopsy (**Grade D; BEL 4**)
- Molecular and histochemical markers are currently not recommended for routine use; their use may be considered in selected cases (**Grade D; BEL 3**)

Why microhistology may be of use for 'indeterminate' nodules?

- Only a minority of “indeterminate” thyroid nodules are a follicular adenoma or a carcinoma (likely < 10%).
- Most of them are ‘hyperplastic adenomatous’ (and benign) nodules, devoid of capsule, or a follicular variant of papillary thyroid carcinoma.

What is Micro-histology?

The histologic examination of a core of thyroid nodule tissue obtained from the target lesion by a thin-needle biopsy (CNB)

Ultrasound-Guided Percutaneous Thyroid Nodule Core Biopsy: Clinical Utility in Patients with Prior Nondiagnostic Fine-Needle Aspirate

Anthony E. Samir,¹ Abhinav Vij,¹ Melanie K. Seale,¹ Gaurav Desai,¹ Elkan Halpern,²
William C. Faquin,³ Sareh Parangi,⁴ Peter F. Hahn,¹ and Gilbert H. Daniels^{5,6}

Non diagnostic cytology

The combination of repeat FNA with CNB classified as diagnostic **87%** of previously nondiagnostic lesions.

Core-Needle Biopsy Is More Useful Than Repeat Fine-Needle Aspiration in Thyroid Nodules Read as Nondiagnostic or Atypia of Undetermined Significance by the Bethesda System for Reporting Thyroid Cytopathology

Dong Gyu Na,¹ Ji-hoon Kim,² Jin Yong Sung,³ Jung Hwan Baik,⁴ Kyeong Cheon Jung,⁵ Hunkyung Lee,⁶ and Hyunju Yoo⁷

Indeterminate cytology

104 “indeterminate” nodules

39 benign 65 malignant

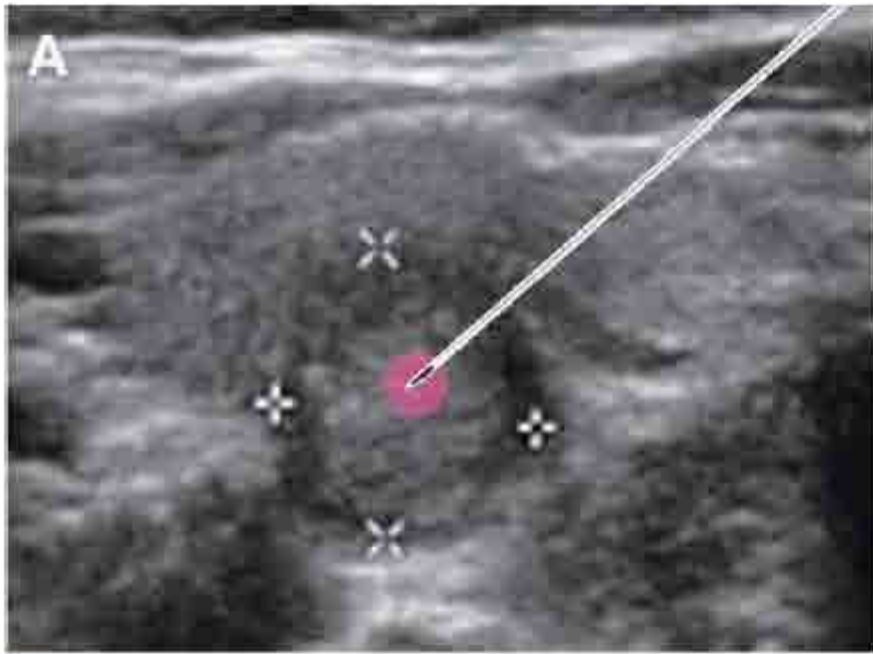
CNB 26 44 (**67%**)

Repeat FNA 27 22 (**34%**)

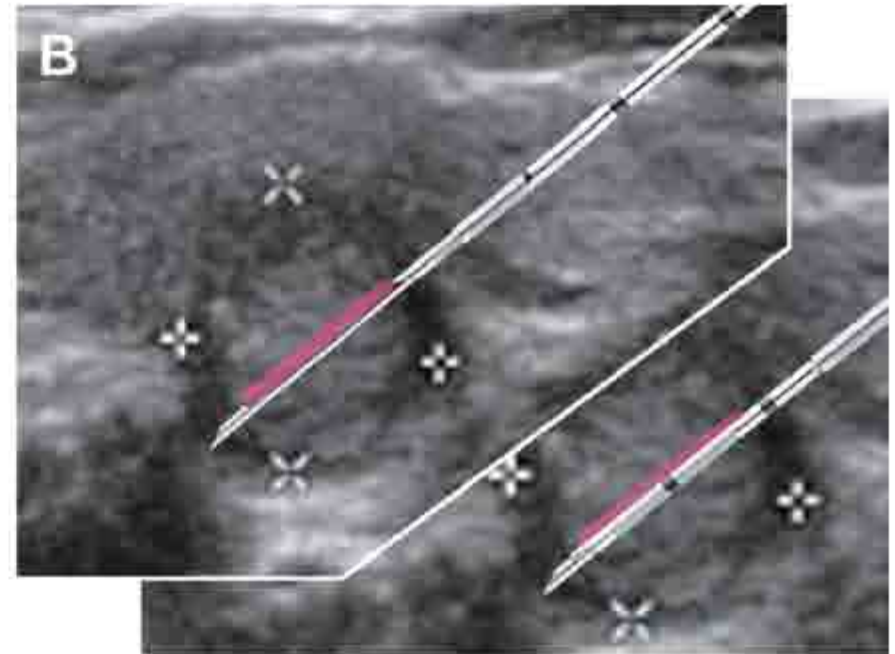
Core needle biopsy Procedure (1)

- tissue sampling for microhistology (or cytology, after crushing) with a 21 – 20 G cutting needle (usually a spring-activated device)
- performed under (experienced) US-guidance
- local anesthesia (xylocaine) down to the prethyroid muscles and thyroid capsule.

Technique of tissue sampling: FNA vs CNB



**FNA by 23-G
spinal needle**



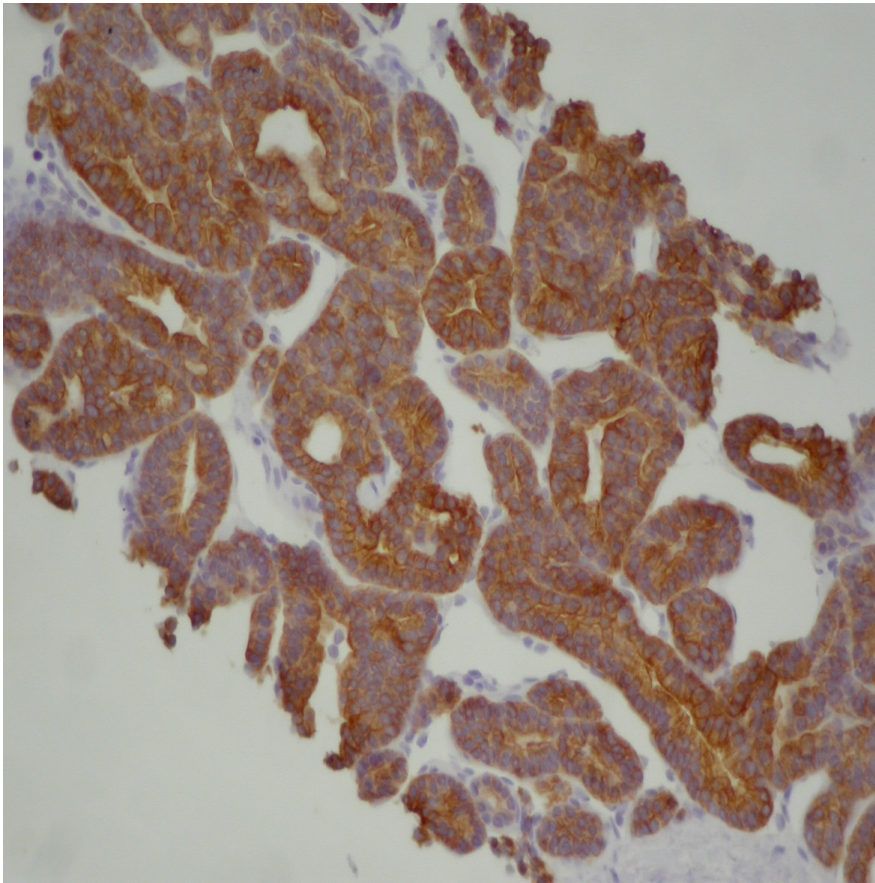
**CNB by 18-G
cutting needle**

Core needle biopsy Procedure (2)

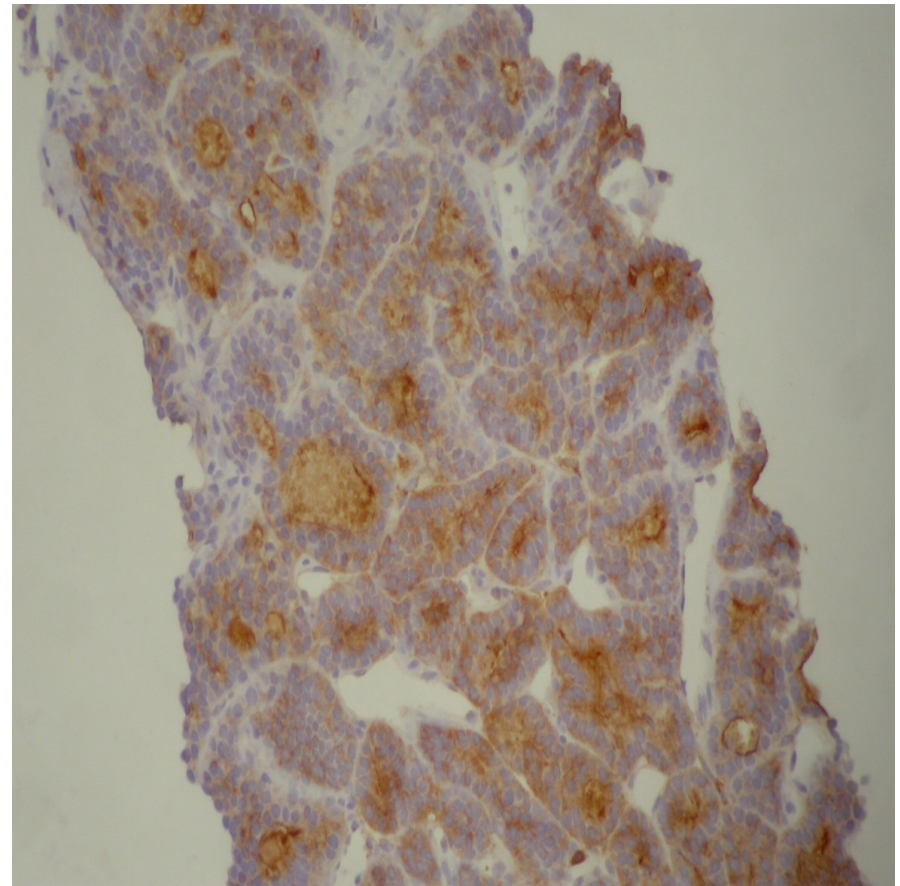
- after the procedure: local pressure for 20 minutes
- clinical and US control after one hour
- no analgesics nor antibiotics.

Follicular Cancer: Immunohistochemical staining on CNB samples

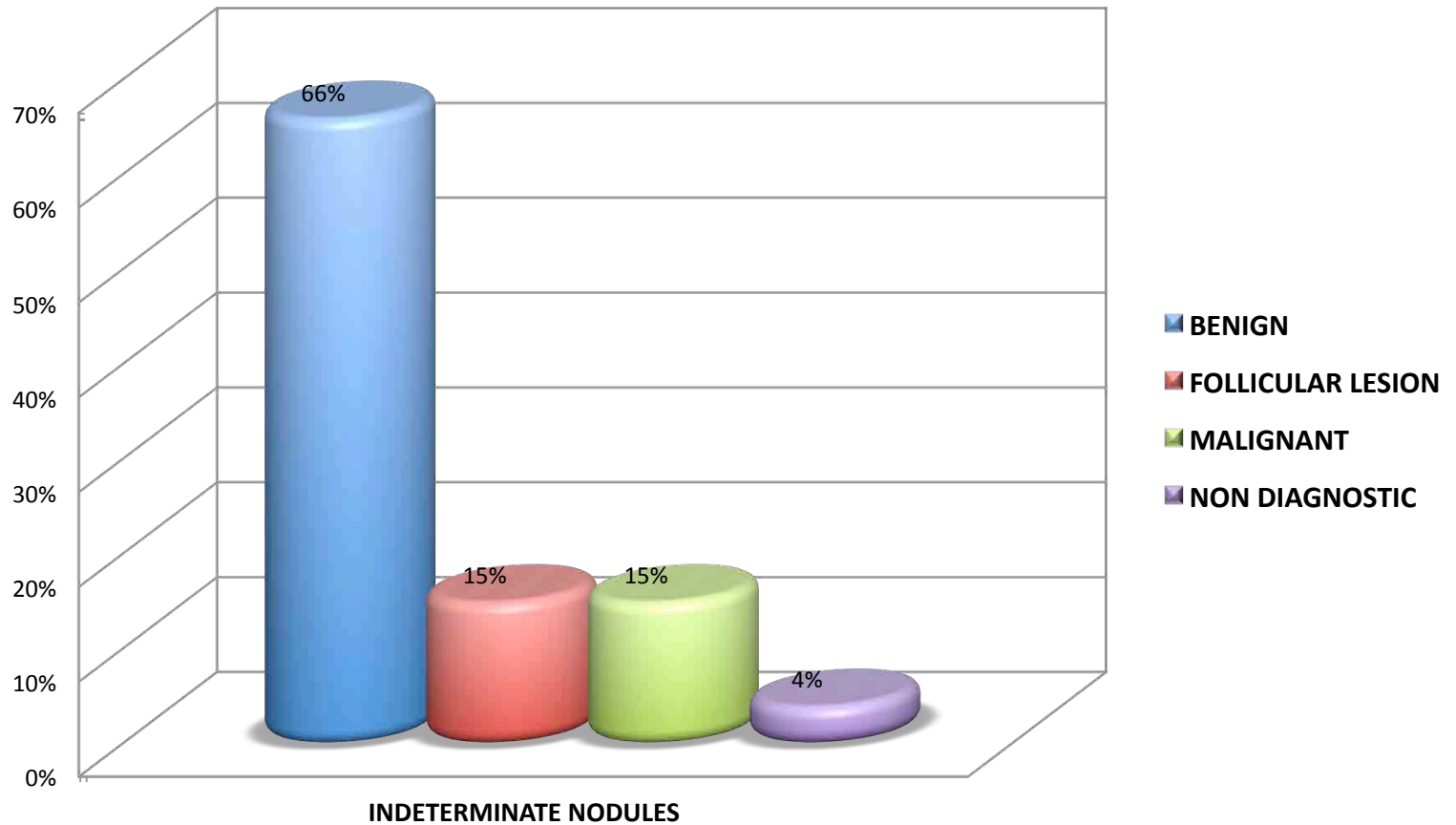
CK19



HBME1



Results of CNB on 54 consecutive “indeterminate” cases at FNA – Regina Apostolorum



What is the role of CNB?

- a mounting evidence demonstrates that CNB is a complementary test in nodules with non conclusive outcome by FNA
- the procedure is safe and well tolerated (in centers with experience); only a short-term US control is needed after the procedure; minor complications are rare
- CNB and NOTdiagnostic surgery” should be performed on solid nodules after repeat “inadequate” FNA.

What is the role of CNB?

- The current evidence does not provide a conclusive estimate of CNB diagnostic accuracy (PPV & NPV) for cytologically “indeterminate” nodules.
- However, the combined use of CNB with a histochemical panel (Gal-3, CK-19, HBME-1) decreases unnecessary surgery and reliably suggests a less extensive surgical treatment for these thyroid lesions.