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Accuracy of fine needle aspiration biopsy cytology of thyroid nodule had improved since the initial usage of the technique. Improvement of the accuacy of interpretation in positive cytology was observed in the second year after the introduction of the technique; improvement of the accuracy of suspicious cytology was observed in the fourth year after the introduction of the technique. Therefore, the result of fine needle aspiration when initially used might not be as precise as the experienced team's. Evaluation of the correlation of cytology and pathological results is essential in order to improve the accuracy of the technique. Finally, to become an expert cytopathologist often requires a more extensive training than to become an expert aspirator.

Key words : *Thyroid nodule, Fine needle aspiration, Cytology.*

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วิทยา ศรีดามา, สมชาย พัฒนอางกูล, สมพงษ์ สุวรรณวลัยกรณ์. ความถูกต้องในการตรวจเซลล์จากการดูดโดยใช้เข็มขนาดเล็กในการวินิจฉัยแยกโรคก้อนเดี่ยวในต่อมธัยรอยด์ ในระยะปีแรกของการใช้เปรียบเทียบกับปีต่อ ๆ มา 5 ปี. จุฬาลงกรณ์เวชสาร 2537 สิงหาคม; 38(8): 457-460

ความถูกต้องในการวินิจฉัยแยกโรค Thyroid nodule โดยการใช้ fine needle aspiration biopsy cytology นั้น ดีขึ้นเรื่อย ๆ หลังจากมีการใช้เทคนิคนี้ในการวิ นิจฉัยแยกโรค ความถูกต้องในการอ่าน positive cytology ดีขึ้นตั้งแต่ปีที่ 2 หลังจาก ใช้เทคนิคนี้ ส่วน suspicious cytology นั้น ความถูกต้องในการอ่านดีขึ้นในปีที่ 4 หลังจากเริ่มใช้ ดังนั้น ผลของ fine needle aspiration ในการใช้ในระยะแรกนั้น ไม่ดี เท่ากับในกลุ่มที่ชำนาญในการใช้เทคนิคนี้อยู่นานแล้ว การประเมินความสัมพันธ์ระหว่าง cytology และผลทางพยาธิวิทยามีความสำคัญในการปรับปรุงการอ่านซึ่งนำมาถึงความถูกต้องของการวินิจฉัย เวลาที่จะฝึกฝนเป็นผู้ชำนาญในการดูดเซลล์จากต่อมธัยรอยด์นั้น อาศัยเวลาน้อยกว่า การฝึกฝนที่จะเป็นผู้ชำนาญในการอ่าน cytology.

Fine needle aspiration biopsy cytology is probably the best method available for differential diagnosis malignant from benign solitary thyroid nodule.[1,2] Reported prevalence of malignancy found in operated cases varied widely. Positive cytology was found to be malignant in 50-97% of operated surgical specimens.[2] Reported prevalence of malignancy in suspicious cytology varied from 15-40%.[3] The objective of this study is to compare the accuracy of fine needle aspiration biopsy cytology for prediction of malignancy in the first year of the introduction of the technique and several years later.

Material and Methods

We used fine needle aspiration biopsy cytology to investigate patients with solitary thyroid nodule in thyroid clinic, Chulalongkorn University Hospital since 1984. Needle gauge 22 attached to disposable twenty ml syringe and Cameco pistol syringe was used to obtain specimens. The contents from aspiration were smeared on the slides and fixed in 95% alcohol or air dired. The slides were then stained by Papanicouloua and Wright-Giemsa dye, respectively.

The aspiration were performed by one of the authors in the first year (1984). In 1985-1986, six medical doctors operated the aspiration. In the last three years (1987-1989), the aspirations were performed by three of the authors and rotating medical residents in endocrinology (approximately sixty residents per year with rotating time of four to six weeks.) Technique of aspiration was demonstrated once for each rotating medical residents. Three of five aspirations by medical resisdents were performed under supervision by one of the authors. Subsequent aspirations by medical resisdents were performed independently.

Cytology was classified into three groups: positive, suspicious, and negative. Surgical treatments were recommended in patients with positive and suspicious cytology. Patients with negative cytology were placed on thyroid hormone suppressive therapy. Fine needle aspirations were repeated for at least two time in patients with partial or no response to thyroid hormone therapy. In the first year, patients in surgical department were include. These patients were operated despite negative cytology.

Cytology was evaluated by one of the authors throughout the entire study period. Evaluations of the correlation of cytology and pathological specimens were previously performed at the end of the first and third year. In this evaluation, we evaluated all operated patients in each year to find the percentage of malignancy in each cytological classification.

Results

As shown in Table 1, in cytology positive group, malignancy was found in 76.2% of operated cases during the first year. Percentage of malignancy in cytology positive group was significantly increased in the later years to 94.9% (100, 100, 75, 88.9 and 100% in 1985-1989, respectively) compared to the first year ($P<0.01$). In suspicious cytology groups, malignancy was found in 19.3, 16, 16, 32, 25.9 and 27.8% during 1984-1989, respectively. Percentage of malignancy in suspicious cytology in the first three years is 17.8, compared to 28.6% in the last three years.

Pathological results in a positive cytology group included papillary carcinoma (77.4%), mixed papillary & follicular carcinoma (9.4%), anaplastic (7.5%) and metastatis carcinoma (5.7%). Pathological finding in a suspicious cytology group included follicular carcinoma (54.3%), mixed follicular and papillary carcinoma (10.9%), anaplastic (2.1%), Hurthle cell (4.3%), papillary (21.7%), Lymphoma (4.3%) and medullary (2.1%).

Discussion

Our results indicated that accuracy of fine aspiration biopsy cytology of thyroid nodule had improved since the initial usage of the techique. this finding explained a wide range of percentage of malignancy reported in the literature in suspicious[3] (15-40%) and positive cytology[2] (50-97%). The technique gave the best result when it was performed by an experienced physician and interpreted by an experienced cytopathologist.[4] In our study, improvement of the accuracy of positive cytology was

Table 1. Percentage of malignancy found in each cytological classification during 1984-1989.

	1984	1985	1986	1987	1988	1989
Positive	76.2 (16/21)	100 (10/10)	100 (10/10)	75.6 (3/4)	88.9 (8/9)	100 % (6/6)
Suspicious	19.3 (14/71)	16.0 (8/50)	16.0 (4/25)	32.0 (8/25)	25.9 (7/27)	27.8 (5/18)
Negative	1/49 (2.0%)	-	-	-	-	-

observed in the second year after the introduction of the technique. Improvement of the accuracy of suspicious cytology was observed in the fourth year after the introduction of the technique. Therefore, the result of fine needle aspiration when initially used might not be as good as the experienced team's. The improvement of accuracy of the cytology was probably related to the time of evaluation of correlation of cytology and pathology results that was performed at the end of the first and third year. Criteria for diagnosis of positive cytology was clearer than suspicious cytology. Therefore, improvement was seen earlier with a small number of specimens. However, it required more experience to define suspicious cytology.

From our study, experienced cytopathologists were probably more important than experienced aspirator, because physicians who performed aspirations in the last three year were mainly rotating medical residents who were not experienced aspirators. Nevertheless, accuracy remained stable for positive cytology and improved for suspicious cytology despite being performed partly by inexperienced aspirators. Finally, when the technique is appropriately instructed, physicians may gain some experience within a short period of time. It takes an extensive training for physicians to be able to accurately interprete cytological results.

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