



Current Practices of Thyroid Fine-Needle Aspiration in Asia: A Missing Voice

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Journal of Pathology and Translational Medicine (JPTM) is pleased to announce a special issue devoted to the current practices of thyroid fine-needle aspiration (FNA) cytology in Asian countries as a joint effort of members of the Working Group of Asian Thyroid FNA Cytology. Currently, this growing network of Asian thyroid pathologists includes representatives from China, India, Japan, the Philippines, South Korea, Taiwan, Thailand, Turkey, and Vietnam.

Asia, as the largest and most populous continent, comprises several geographic regions with notable ethnic, cultural and religious diversity. The different levels and pace of economic growth within these regions determines the development of local health systems. Most Asian countries are well integrated into the modern international medical community. Contemporary practices in various fields of medicine were established under a strong Western influence. On the other hand, Asian philosophy, traditional Chinese medicine, Ayurveda, and other conventional medical practices with deep historical roots are often integrated into advanced medical approaches.^{1,2}

Consistent with its huge population, the Asian continent is the largest contributor to the worldwide prevalence of thyroid cancer. According to the GLOBOCAN estimates, 48% of all new thyroid cancer cases are diagnosed in Asia.³ In addition, the absolute number of patients with thyroid cancer increases each year, and this growth has recently been labeled a thyroid cancer epidemic,

due to unexpectedly high increases compared to estimates.⁴ South Korea is the best example of this thyroid cancer “epidemic,” which has been proven to be largely caused by opportunistic screening.⁵ The same epidemic in many Western countries with a growing incidence of thyroid cancer was later attributed to opportunistic screening also.⁶ As a result of these epidemiological shifts, thyroid cancer and thyroid nodules have attracted considerable attention from the medical community worldwide.

Leading medical centers in well-developed Asian countries have promoted innovative approaches and disseminated high-quality evidence, which has profoundly influenced international practice.^{7,8} Numerous publications from Japan and Korea have laid the ground for national guidelines on the management of thyroid cancer and thyroid nodules, which are finely tuned to the local settings.^{9,10} At the same time, guidelines from less advanced Asian countries largely rely on international recommendations partially adjusted to lower economic standards.¹¹⁻¹³

Thyroid FNA is a mainstay of preoperative diagnosis of thyroid nodules, which drives further decision making.¹⁴ This simple procedure is available globally and has been accepted as the first-line intervention in the workup of thyroid nodules, which can significantly reduce unnecessary surgery. Unlike in gynecologic cytopathology, evaluation of thyroid FNA is usually performed by surgical pathologists who tended to apply their own classification schemes used in histopathologic diagnosis of thyroid nodules. As a result, cytologic diagnoses applied to thyroid FNAs were not uniform and clear, but rather variable and vague. Furthermore, a substantial number of samples are found to be uncertain, indeterminate, equivocal, or suspicious, which can create confusion for the clinicians with regard to treatment planning.

In the effort to standardize thyroid cytologic terminology and

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to improve communication between pathologists and clinicians, a new reporting system encompassing six diagnostic categories was proposed around 10 years ago.¹⁵ Since that time, the Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) has received universal acclaim and has been endorsed by numerous national and international societies in the fields of endocrinology, thyroidology, and cytopathology.¹⁶ Beyond TBSRTC, several countries, including the UK, Italy, and Japan, have established their own systems for reporting thyroid cytopathology.¹⁷⁻¹⁹ Nevertheless, the terminology used in non-Bethesda reporting systems is easily adjustable to Bethesda diagnostic categories, which is important for comparison.

Each of the modern systems for reporting thyroid cytopathology provides important statistical outputs, which serve as the quality control criteria. These criteria include (1) distribution of thyroid FNA samples by diagnostic category; (2) resection rate (RR), measured as a ratio of surgically excised nodules to all sampled thyroid nodules within a certain category; and (3) risk of malignancy (ROM) or the percentage of malignant nodules among all FNAs. ROM is important because it indicates the necessity of surgical treatment. The original TBSRTC estimated ROM ranges for diagnostic categories based on preceding literature.¹⁵ These estimates were further modified in meta-analyses to provide the actual ROM, summarized from the numerous

single- or multi-center studies.²⁰⁻²³

Most meta-analyses on thyroid FNA and TBSRTC have not included Asian publications.²⁰⁻²² Only one meta-analysis included a fair number of original studies from Turkey, Korea, and Arabic countries.²³ In fact, experience with thyroid FNA in Asia has been extensively reported. Recently, the results of a nationwide study covering more than 42,000 FNAs were presented by the Korean Society of Endocrine Pathologists.²⁴ Japanese institutions have also shared their experience with the Japanese system of reporting thyroid FNA.¹⁸ There is a growing number of publications from India and China. Reports on thyroid cytology from Southeast Asia are less abundant and often non-systematic. Notwithstanding, we should note that even low-resource countries, for example, Bangladesh and Nepal, have been able to publish their experience with thyroid FNA.^{25,26} Once again, despite the efforts of Asian cytopathologists to share their data with the international community, their voice has not been recognized. Hopefully, output data on the use of TBSRTC from major Asian countries summarized in this special issue will contribute to future meta-analyses of the Bethesda system.

An important lesson learned after comparison of Asian and Western series is that the Asian experience varies in several aspects. Thyroid FNA studies disclosed low RR and high ROM for indeterminate nodules in Asian practice.²⁷ This could be explained by



Fig. 1. Members of the Working Group of Asian Thyroid FNA Cytology and hosts during the inaugural meeting of the 12th Asia and Oceania Thyroid Association (AOTA) congress in Busan, Korea (March 16, 2017). FNA, fine-needle aspiration. *Left-to-right:* Z. Liu (China), K. Kakudo (Japan), C.R. Lai (Taiwan), S. Satoh (Japan), S. Keelawat (Thailand), S. Canberk (Turkey), A. Bychkov (Thailand), S.W. Hong (Korea), D.E. Song (Korea), C.K. Jung (Korea), H.J. Kwon (Korea), M. Hirokawa (Japan), H.K. Chang (Korea).

the more conservative management approach for indolent thyroid tumors compared to Western practice.²⁸ As a result, borderline thyroid tumors, such as noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) and well-differentiated tumor of uncertain malignant potential, are histologically rare in Asian countries.^{29,30} These differences are not acknowledged worldwide, which continues to create confusion among experts due to this lack of communication. It should be reiterated that the Asian continent is a major contributor to the global prevalence of thyroid cancer, and that local experience cannot be ignored.

International communication is a key factor in disseminating knowledge and staying up-to-date. There are several international forums held annually for pathologists in Asia, but until recently there were no active well-established networks for those practicing within the thyroid niche. The Working Group of Asian Thyroid FNA Cytology was established recently to promote communication among Asian pathologists and cytopathologists, to share experience in Asian practice, and to conduct multi-institutional studies. An inaugural meeting took place at the 12th Asia and Oceania Thyroid Association (AOTA) Congress in Busan, Korea on March 16, 2017 (Fig. 1). Despite its recent formation, several achievements have resulted from this joint effort. Senior group members released a book *Thyroid FNA Cytology: Differential Diagnoses and Pitfalls*, which was published in 2016 as the first English language textbook on thyroid FNA cytology from Asia.³¹ Several authors contributed to a special NIFTP issue of the *Journal of Basic and Clinical Medicine*.³²⁻³⁵ More original studies and reviews have been published^{28,29,36} or are currently in process.

Presented herein is a collection of articles on the current practices of thyroid FNA cytology in Asian countries that highlights important aspects of this diagnostic technique, including details on operators and readers, sampling and preparation, and reporting systems and audit programs. Also included are original data collected from the authors of previous publications and statistics from literature review. The authors wish to thank JPTM for hosting this special issue. We hope that our contemporary reviews will serve as a useful reference for a wide variety of specialists involved in the management of patients with thyroid nodules and thyroid cancer.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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