

# Introduction and Development of Pathology in Korea

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## Introduction

Pathology is the study (logos) of suffering (pathos). As a science, pathology focuses on the structure and functional consequences of injurious stimuli (irritants) on cells, tissues, and organs and ultimately the consequences on the entire organism. There are four aspects of a disease process that form the core of pathology: (1) its cause (etiology), (2) the mechanisms of its development (pathogenesis), (3) the structural alterations induced in the cells and organs of the body (morphologic changes), and (4) the functional consequences of the morphologic changes (clinical significance). Virtually all forms of tissue injury start with molecular or structural alterations in cells, a concept first put forth in the 19th century by Rudolf Virchow (1821-1902), known as the father of modern pathology. In fact his doctrine of "Cellular Pathology" provided the basic concept of modern medicine and played a critical role in distinguishing Western medicine from Oriental medicine.

In the 19th century, particularly in the 1880s when the Cellular Pathology concept was popularized in Europe, Korea was still under the strong influence of Oriental medicine and the concept of pathology was different. In oriental medicine, Pathology was mostly etiology or pathophysiology, rather than morphology. Therefore, from the view of Cellular Pathology, one may say that there was no concept of pathology in Korea in the 1880s, because pathology cannot exist without visual demonstration of a diseased organ or tissue.

The concept of "cell" was far from treatment-oriented traditional medicine in Korea. Related subjects of Cellular Pathology, such as biology, physics and chemistry were also not utilized or practiced in relation to medicine at that time.

It is hard to imagine how the concept of modern medicine entered the environment that had long been strongly influenced by Oriental philosophy. Without the concept of "cell", modern pathology cannot be understood. Pathology deals with abnormal anatomy and abnormal histology. For anatomy one has to dissect human bodies. The fact that a human body is dissected does not necessarily mean autopsy. An autopsy is a specialized gross and microscopic examination of the human body based on modern medical knowledge of anatomy, histology, physiology and clinical medicine. Postmortem examination, also called autopsy, had not been performed until 1913 in Korea. The second important factor in pathology is the availability of the microscope. The identification of "cells" could only be done by observation under the microscope. The microscope played a critical role in Virchow's Cellular Pathology. Macrophage, inflammatory exudate, tumor cells, etc. were all known to be present only by the microscopic observation.

### Dawn of Pathology in Korea

In Korea, the microscope had not been used as a tool of science before 1900. It is assumed that the microscope was first used to examine diseased tissue by Dr. Inamoto (稲本龜五郎), when he was appointed as a pathologist in charge of the pathology department of Chongdogbu hospital in 1913<sup>1)</sup>. Autopsy rooms, histology laboratories and microscopic reading rooms are basic facilities of hospital pathology departments. Therefore, we can presume that autopsy tables, microtomes, microtome knives, various staining dyes and microscopes were brought into Korea from Japan at that time.

There are records of microscopic study in Korea before the arrival of Dr. Inamoto<sup>2)</sup>. However, it has not been confirmed whether the microscopic slides were made in Korea or the specimens were sent to Japan for the preparation. Dr. Inamoto was a faculty member of Kyoto Imperial University of Japan. Dr. Inamoto worked actively, reading surgical specimens and performing autopsies at the hospital since his arrival in Korea from Japan. He also engaged in animal experiments. He published several articles based on histopathological observations of the diseased tissue.

Meanwhile, around 1913 there was an American missionary doctor who came to Korea and worked at Severance hospital<sup>1)</sup>. His name was Dr. Mills. Dr. Mills engaged in laboratory medicine at Severance hospital, particularly in the fields of microbiology and parasitology. He also taught pathology at Severance Union Medical College. His hospital service at Severance could be considered a start of clinical pathology or laboratory medicine in Korea, since Severance Hospital adopted the American hospital system. In the U. S.A, all laboratory tests are done by a centralized "Pathology Department", in contrast to the Japanese system, where laboratory tests, including histological examinations, are carried out by the individual clinical departments. In other words, the pathology department is a major department of a hospital in the American system, whereas pathology departments do not exist in hospitals in the Japanese system. However, Dr. Mills did not engage in any tissue examination, and limited his service to other laboratory examinations. In other words, histopathology service was not provided at Severance hospital at that time.

The first government medical school of Western medicine was established in 1899 in Korea. However, a pathology department was not organized at the start, and pathology was not included in the curriculum. Actually there was no qualified pathologist to teach

pathology and perform autopsy when the school started. In 1916, after the annexation of Korea by Japan this government medical school was merged with Keijo Medical College by the Japanese and a department of pathology was established as an academic unit for the first time in Korea. Dr. Inamoto, who used to teach pathology to the students of the government medical school since his arrival to Korea, became the first professor and chairman of this department. He taught pathology to the students and published many articles concerning the pathologic features of various diseases in Korea, especially relating to paragonimiasis and relapsing fever.

The second professional pathologist in Korea was also a Japanese, named Tokumitsu (徳光美福) who came to Korea in 1918 to teach pathology at Severance Medical School that was promoted to Severance Union Medical College in 1917<sup>1)</sup>. He replaced Dr. Mills who left Korea in the same year. Dr. Tokumitsu was a faculty member at Tohoku Imperial University of Japan, who had a deep interest in experimental pathology. At Severance he functioned mainly as a pathology lecturer. He did no hospital service or research until he moved to Keijo Medical College in 1921.

Who would be the first Korean pathologist? Dr. Hyun-Joo Kim (金顯周) who is a graduate of Keijo Medical College became a professor of pathology of the same medical college in 1924. Since he was promoted to full professor and published many articles on lung cancer pathology, he deserves to be considered the first Korean pathologist. However, he gave up this privilege and later became a practicing physician instead of remaining and functioning as the first Korean pathologist.

It was Dr. Il-Sun Yun (尹日善) who deserves to be called the first Korean pathologist in practical sense. He graduated from Kyoto Imperial University Medical School of Japan and completed graduate school at the same university, and earned the doctor of medical

science degree. His teacher was Dr. Fujinami, who studied pathology under R. Virchow in Germany and returned to Japan to become the chairman of the Department of Pathology of Kyoto Imperial University. He was one of the leading Japanese pathologists at that time. Dr. Yun returned home in 1928 to be appointed as an assistant professor of Keijo Imperial University. He belonged to the first department of pathology directed by Professor Kosugi (小杉虎一). Next year in 1929, Dr. Yun left Keijo Imperial University to take the position of professor and chairman of the Pathology Department of Severance Union Medical College. His activity as a pathologist had been brilliant at Severance. He engaged himself deeply in research through animal experimentation.

In 1931, Paul D. Choy (崔棟) became an assistant professor of pathology at Severance Union Medical College. He graduated from Severance Union Medical College in 1921 and studied parasitology in China and later forensic pathology and pathology in Canada<sup>3)</sup>. He practiced surgical pathology at Severance Hospital. Histological diagnosis of malignant tumors was carried out and the first tumor statistics based on histological type were available in 1933<sup>4)</sup>. Since his appointment, hospital tissue pathology service was routinely provided at Severance. This means that the modern pathology system, consisting of diagnostic pathology at the hospital and research pathology at the school was adopted and practiced for the first time in Korea.

In 1926, a third medical school was founded. This was the first university medical school in Korea founded and run by the Japanese. Keijo Imperial University Faculty of Medicine (京城帝國大學醫學部) was the formal name. At the start, two departments of pathology were organized. The first department of pathology was directed by Professor Kosugi and the second department of pathology was directed by professor Tokumitsu, who had been professor and chairman of

the pathology department of Keijo Medical College. The pathology department of Keijo medical college was succeeded by Dr. Muto (武藤忠次). In these two Japanese medical schools there were several Korean graduate students who studied pathology. They assisted Japanese professors in research work and participated in teaching pathology to the students. In Korea of the 1930s, modern (Western) medical doctors who graduated from above medical schools began to compete with Oriental medical doctors and took a position of high expectation and esteem among people. When physicians and surgeons earned the degree of doctor of medical sciences (醫學博士) at that time, their practice became quite prosperous because people respected their knowledge and experience. Therefore, in every department of basic medical sciences of the Keijo Imperial University many native Korean medical graduates registered for the course. Keijo Imperial University was the only organization in Korea which could confer the doctorate degree at that time. Pathology became an important discipline in medical schools, and the curricula of medical schools included pathology lecture, pathology laboratory and histopathology laboratory during the sophomore year and autopsy seminar during senior years.

In 1945, when Korea was liberated from Japanese rule, only a handful of scientists existed in all sectors of science throughout Korea. The medical field was no exception. However, the situation was better in medicine compared to other sectors of science. In pathology, by the time of liberation, there were 2 full professors, several assistant professors and many graduate students from 4 medical schools. These pathologists played a major role in the foundation of the Korean society of pathology in 1946.

#### Foundation of the Korean Society of Pathologists

The Korean Society of Pathologists was founded on October 1,

1946, one year after the end of the Second World War. Twelve pathologists were gathered for the founding of the Society by the leading role of late Professor Il-Sun Yun, then professor of pathology of the newly assembled Seoul National University College of Medicine. All of the Korean pathologists who became the charter members of the Society were those who had worked as faculty or research assistants at the pathology departments of Keijo Imperial University Faculty of Medicine, Keijo Medical College, Severance Union Medical College and Keijo Women's Medical College during the Japanese colonial occupation. Twelve charter members are Il-Sun Yun, Chae-Koo Lee (李濟九), Eung-Yull Lee (李應洙), Chang-Soo Chung (鄭昌洙), Young-Chae Kim (金永濟), In-Sup Hyun (玄寅燮), Dong-Sik Kim (金東式), Suk-Chae Hong (洪錫宰), Woo-Kyeun Park (朴雨均), Chang-Choon Nam (南昌春), Boo-Ho Ahn (安富浩) and Kook-Hoe Koo (具國會). At the inaugural meeting, Dr. Il Sun Yun was elected the first president of the Society and Dr. Chae Koo Lee as vice president. Study and research in the field of pathology and exchange of academic information and knowledge among the members were the purposes of the Society<sup>1)</sup>.

From 1949 the Society held a regular academic meeting annually under the auspices of the Korean Medical Association until 1956, with the exception of 2 years during the Korean war. From 1957, the Society started to have its own meeting. At each annual convention the presentations of papers increased progressively. The average number of papers presented at annual conventions was 25 in the 1950s, 50 in the 1960s, 80 in the 1970s, 110 in the 1980s and 250 in the 1990s.

Although the Korean war destroyed everything, it gave a big impact to pathology in Korea. It was the introduction of the American pathology system to the Korean medical community. During and immediately after the war many Korean medical graduates went to U.S.A. and studied pathology, mostly hospital pathology.

They experienced a new hospital pathology system there. They came back home and became leading hospital pathologists.

In 1959 the official journal of the Society, "The Korean Journal of Pathology", began to be published. Until 1976 the Journal was issued biannually and became a quarterly journal in 1977. Now the Journal is a monthly periodical with an average of 15 articles per issue. The pathology specialist system for the hospital service was adopted in 1963. Three categories, i.e., anatomical pathology, clinical pathology and combined anatomical and clinical pathology were opened. One year of internship was required before the specialty training. As of 1997, a total of approximately 1000 pathologists have been registered, consisting of 500 anatomical pathologists and 500 clinical pathologists.

#### Transition from Japanese system of pathology to American system.

It took considerable time for Korean pathologists to understand the American pathology system. In the Japanese system, the pathology department was one of the basic science departments, such as anatomy, microbiology, pharmacology, etc. However, in the American system pathologists are expected to work a whole day at the hospital, doing surgical pathology and postmortem examinations of the patients. Cytology was another important work to do at the hospital. In this context, quality control and exchange of opinions among pathologists became important. Therefore, there was a need of regular meeting of pathologists.

A "Monthly slide conference" was started by several pathologists in Seoul in 1959 under the name of "Monthly meeting of Seoul pathologists" following the proposal of Dr. Kristen Arnesen, a Scandinavian pathologist<sup>1)</sup>. He was the first head of department of pathology of the National Medical Center which was established in 1958 by the joint efforts of the government of the Republic of Korea



and the governments of the three Scandinavian countries. Seoul National University, Yonsei University, National Medical Center and Holy Ghost Medical College (Now Catholic University Medical College) were the 4 participants who joined the meeting from the beginning. This conference was incorporated into the official academic activity of the Korean Society of Pathologists in 1965. The participating institutions of this meeting increased to 11 by 1963, 24 by 1983 and 51 by the end of 1995. This conference has contributed enormously in training residents and refining diagnostic skills of practicing pathologists.

#### Documentation of pathology works in Korean literature

The first Korean scientific journal related to medicine was Chosen Medical Journal that started in 1911. Although this periodical was not a pathology journal, papers related to pathology were published in this journal. No Korean was included in the editorial board of this journal. In the first issue of the Chosen Medical Journal there were several articles related to histopathology. Colloid goiter, multilocular bone cyst and fibroma, as described by Emoto<sup>2)</sup>, are lesions which need histological examination. In 1914, the first paper on autopsy description appeared in the Chosen Medical Journal<sup>5)</sup>. In 1917, Keijo Medical College put out a journal, the Journal of Keijo Medical College, which included many articles on pathology until 1945.

In the 1920s, Dr. Hyun-Joo Kim published a series of papers concerning histopathological observation of lung cancer<sup>6)</sup>. However, papers on animal experiments were not available until 1922, when Professor Tokumitsu's paper on adrenal gland of animal appeared<sup>7)</sup>. In 1924, an article on experimental hypovitaminosis A appeared in the Chosen Medical Journal<sup>8)</sup>. The first paper by a Korean pathologist appeared in 1920 in the Chosen Medical Journal

under the title of "Intestinal Lipoma"<sup>9)</sup>

During the Japanese occupation, particularly between 1930 and 1945, the Severance Pathology Department published a series of articles on experimental anaphylaxis of various organ systems<sup>1)</sup>. Sporadically, case reports on human parasitic infection or cancer appeared in the Choson Medical Journal (朝鮮醫報) (started in 1930) and the Journal of Severance Union Medical College (started in 1933). The publication of the Severance Pathology Department was quite active in this period, and some of these articles were published in pathology journals of Japan<sup>1)</sup>.

The departments of pathology of two Japanese medical schools put out a large number of articles. Most of them were pure research articles based on animal experiments<sup>1)</sup>. Autopsy cases of rare diseases were occasionally published in the Chosen Medical Journal, the Journal of Keijo Medical College and Acta Medicinalia in Keijo (started in 1928)<sup>1)</sup>.

There were two other public medical colleges, namely Pyungyang Medical College and Taegu Medical College, that started in the 1930s. However, no pathology works by Koreans were published from these institutions. After liberation, only a few original papers could be published because there were no periodicals that accepted original papers and animal experimental works. This situation lasted until around late 1950, when specialty journals and commercial journals and a few medical school journals became available.

During and after the Korean war, military medical journals started to publish papers. In 1958, the Journal of the Korean Medical Association and specialty journals, e.g., the Korean Journal of Internal Medicine, Pediatrics, Ophthalmology and Otolaryngology journals became available. However, a pathology specialty journal could only be started in 1967.

## Summary and conclusion

If one defines pathology as gross and microscopic examination of abnormal tissue there was no comparable discipline in traditional medicine of Korea until the introduction of Western medicine in Korea. However, when one widens the scope of pathology to include pathogenesis and etiology, there were some pathology-related descriptions in Oriental medicine long before this period.

The pathology based on Virchow's cellular pathology was introduced to Korea through two tracks independently in 1910s. One was academic pathology, through Japanese pathologists, namely Dr. Inamoto and Dr. Tokumitsu, and the other track was hospital pathology through Western missionaries who introduced the American system of laboratory medicine (clinical pathology). It was Japanese who dominated the introduction and development in Korea. The Koreans played a minor role in the development of pathology from the introduction period until 1945, when the Korea was liberated from Japan. Pathology teaching, research and hospital service had been consistently carried out through three medical schools, namely Severance Medical School and two government medical schools until 1945. After independence, the Korean Society of Pathologists was quickly organized and made a rapid promotion. The Korean war provided opportunities to experience and adopt the American pathology system in Korea. The hospital pathology system has been established, together with the pathology specialty system in Korea. Balanced promotion of research pathology and service pathology is expected in Korea.

## References

- 1) The Korean Society of Pathologists: The First 50 Years of the Korean Society of Pathologists, 1996 (In Korean)
- 2) 江本茂：2,3腫瘍の組織標本供覧(膠様甲状腺腫, 多胞性骨囊腫, 頸部纖維腫) 朝鮮醫學會雜誌 1 : 35, 1911 : (Histology specimen demonstration (Colloid goitre, multilocular bone cyst, cervical fibroma. Chosen Med J 1 : 35, 1911.) (In Japanese)
- 3) Shin DH : Dr. Paul D. Choy : The first surgical and clinical pathologist in Korea. 延世醫學史 (Yonsei Medical History) 2 : 227-230, 1998 (In Korean)
- 4) Choy PD : The result of 740 sections diagnosed. J. Severance Union Medical College 1 : 1, 1933
- 5) 杉山貞：心囊炎者の一剖検例. 朝鮮醫學會雜誌 11 : 86, 1914 (An autopsy case of a pericarditis patient. Chosen Med J 11 : 86, 1914) (In Japanese)
- 6) 金顯周：原發性肺癌腫. 朝鮮醫學會雜誌 37 : 35, 1922 (Primary Lung Cancer. Chosen Med J 37 : 35, 1922) (In Japanese)
- 7) Tokumitsu : On the effect of adrenal in secretion of several vaccine immunized serum and bacterial toxin. Chosen Med J 41 : 21, 1922.
- 8) 片岡八束：實驗的「ビタミン」A 缺乏症ニケル臟器變化ニ就テ」朝鮮醫學會雜誌 48 : 123, 1924. (On the changes of organs by experimental hypovitaminosis A. Chosen Med J 48 : 123, 1924) (In Japanese)
- 9) 金顯周：腸管脂肪腫. 朝鮮醫學會雜誌 30 : 63, 1920 (Intestinal lipoma. Chosen Med J 30 : 63, 1920) (In Japanese)

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