From Glass Slides to Digital Images:

Exploring the Evolution of Pathology Diagnosis

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Pathology diagnosis is undergoing a global transformation, shifting from analog methods reliant on glass slides and microscopes to digital methods using digital image files and computer monitors. The development of artificial intelligence (AI)-based programs in pathology has further fueled this transformation, with some already being employed in diagnostic settings. Consequently, medical institutions worldwide, including those in Japan and Korea, are actively working towards successful implementation of digital pathology system (DPS). However, adopting and effectively utilizing digital pathology (DP) presents a lot of challenges, including pathologists' unfamiliarity with equipment such as scanners, computers, networking, archive servers, as well as the integration of DP with the existing medical information services within hospitals. Additionally, the current pathology labs are optimized for microscope-based diagnostic systems, necessitating additional manpower and potentially resulting in increased turnaround time when transitioning to DPS.

To successfully introduce DPS and ensure active engagement from all members of the department, a strategic approach is crucial. It is essential to recognize that the adoption of DPS extends beyond the acquisition of scanners and archive/operating servers; it necessitates a comprehensive transformation of the entire pathology system, encompassing the digitalization of the department. Data integration is a critical aspect that requires careful consideration. The integrated interpretation of clinical information, including patient history and the results of laboratory tests and radiologic findings, previous pathological diagnoses, and the findings of ancillary tests, is progressively gaining importance in pathology diagnosis. Consequently, it is essential to manage and digitize medical data comprehensively, including digital pathology images.

The digitalization of pathologic data offers an advantageous environment for the utilization of AI-based analysis software tailored to pathology data. With advancements in deep learning, diagnosis-assisting programs are being developed to enhance pathology practice. Efforts must be directed towards creating an environment that maximizes the utilization of these programs. Lastly, considerations regarding data storage and utilization are necessary. The true value of data lies in its efficient and effective utilization. Thus, selecting high-value stored data and implementing strategies for optimal utilization are paramount.

This presentation introduces the endeavors of Asan Medical Center, exemplifying efforts aimed at addressing these challenges and finding solutions in the field of DP.