

REVIEW ARTICLE



Is the past perfect present tense future continuous for anatomic pathology?

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Abstract

Changing trends in patient care defines and redefines the role of caregivers. The future needs to be addressed to make pathology more visible and more prospective for medical students. Role of pathologists in value added services will define future training programs.

Introduction

Examining the nature, course, and resolution of disease is focused upon in the discipline of “Pathology” which literally means “study of suffering.” To become an anatomic pathologist, one attends medical school, completes a residency in general pathology, and then focuses on anatomic pathology.^[1]

Anatomical or anatomic pathology is a medical specialty that is concerned with the diagnosis of disease based on the gross, microscopic, chemical, immunologic, and molecular examination of organs, tissues, and whole bodies (autopsy).^[2]

Work in this field can be varied and quite rewarding. Work in this area needs excellent attention to detail, with great descriptive skills so as to communicate clearly in pathology results. A high tolerance for unpleasant sights and strong odors is needed in pathology laboratories.^[1]

Anatomic pathology program strives to achieve for the residents, during the training period excellence to guide decisions for best patient care and management and to advance frontiers of patient care by integrating the pathology with clinical specialties. As Sir William Osler said “as is our pathology so is our practice; what the pathologist thinks today, the physician does tomorrow.”^[3]

Anatomical Pathology Practice Settings

- Academic anatomical pathology
- Group practice

- Large corporate providers of anatomical pathology services
- Multispecialty groups

There are a number of subspecialties, these include:

- Neuropathology
- Thoracic pathology
- Gastrointestinal and liver pathology
- Urologic pathology
- Gynecologic pathology
- Breast pathology
- Musculoskeletal pathology
- Dermatopathology
- Hematopathology
- Renal pathology.

The procedures used in anatomic pathology include:

- Gross examination: The examination of diseased tissues with the naked eye. It is important to select areas in large tissue fragments to be processed for histopathology
- Histopathology: The microscopic examination of hematoxylin and eosin (H and E) stained tissue sections, to provide specific diagnoses based on morphology, a core skill in this field
- Immunohistochemistry (IHC): The use of antibodies to detect specific proteins.
- *In situ* hybridization: Specific deoxyribonucleic acid and

ribonucleic acid molecules can be identified on sections. The technique is called fluorescence *in situ* hybridization, when the probe is labeled with a fluorescent dye.

- Cytopathology: The examination of cell spread using cytology techniques
- Electron microscopy: The examination of cell organelles at great magnification, has been largely replaced by IHC but in use for diagnosis of kidney disease
- Tissue cytogenetics: The visualization of chromosomes
- Flow immunophenotyping: Using flow cytometry techniques to diagnose the different types of leukemia and lymphoma.^[4]

Anatomical pathology is a discipline built upon the interpretation of changes in tissues and cells. Anatomical pathologists have spent many years studying the various components of the art-gross anatomy, histology, cytology.^[5]

The H and E technique has proved one of the most durable in medicine and has remained essentially for over half a century unchanged except for automation and time compression of some of the steps. The technique works extremely well, though it is far from ideal. Masson, a master of histologic techniques, regarded formalin as a poor fixative and H and E as a poor stain. Yet, it is difficult to argue with success. It allows an accurate microscopic diagnosis of the majority of specimens sent to the laboratory. But, it simply cannot answer all the questions that the case poses at the plain diagnostic level. The pathologist has always searched for additional techniques to probe an etiologic, histogenetic, or pathogenetic quest. Colloquially, these techniques have been referred to as “special,” simply because they are applied only under special circumstances. Most of them have gone (or are going) through three distinct phases: An initial phase of unrestrained enthusiasm followed by a phase of equally vigorous criticism, the matter eventually settling into a situation in which the techniques are accepted as useful aids only when applied to selected situations and always referring back to conventional morphology as the standard by which they should be interpreted.^[6]

The great paradigm shift in anatomical pathology has provided us with technology that we use but do not fully understand and burdened us with an increasingly complex literature without concomitant guidance on how to deal with it. Not many of us have devoted efforts to the understanding of the essentials of genetics, proteomics, and their techniques. Hence, uninformed acceptance of poorly understood techniques alters the role of a pathologist from an expert who can make independent judgments to an information specialist who must rely upon the judgments of others: A fundamental paradigm shift in anatomical pathology.^[5]

It might be comforting to realize that over the 150 years of its existence, pathology has been changing constantly. Beginning as a way for individual clinicians to enhance the treatment of their particular patients, pathology had evolved as a full-time discipline by the early 20th century. After World War II, surgical pathology came into its own so successfully that it nearly eclipsed both autopsy and cytopathology. Surgical pathologists were redefining disease in terms of the appearance of tissues

and cells under a light microscope. The notion that diseases manifested their nature in their morphology took a very firm hold. Pathologists were the doctor’s doctor. They were the specialists and clinicians were the generalists.^[6]

Over the last 25 years, these have changed. Clinicians are now the specialists, whereas most pathologists have become general practitioners. Some anatomical pathologists pride themselves with good reason on their vast knowledge of many sub-disciplines; but no one can keep up with the pathologic literature, and the need to remain a generalist is primarily financial. The overriding reason to believe that sub-specialization in anatomical pathology is the way of the future is that clinicians demand it. The issue has become credibility, not competence. The benefits to pathologists are decreased literature to negotiate, increased credibility and respect, and decreased the medicolegal exposure.^[5]

Academic anatomic pathologists have found merit in sub-specialization, classification, identification of a vast array of individual genes, enzymes, protein products, etc., as prognostic factors, and the identification of countless variations of the expression of human neoplasms. Each subspecialty, no matter how small, seeks legitimacy through creation of the Society that gives voice to an ever-increasing amount of detail, often acquiring its own journal space to more effectively spread the word.^[7]

The Editorial by Murphy WM in Human Pathology aptly describes the scenario in anatomic pathology. The changes are far advanced, and the great paradigm shift is altering not only how they do things but how they are perceived and who they are as a discipline. Almost every aspect of the discipline has been affected; and although the general pathologist is unlikely to disappear (it was not that long ago when autopsy was king), the status is unlikely to remain what it is today.

As in surgical pathology, in general, a balanced approach incorporating the new where indicated, but never forgetting the “old,” will hold the diagnostic pathologist in good stead and, more importantly, result in optimal patient care.

Anatomical pathologists have adopted the language and, increasingly, the culture of business. They speak of their consultations as a “product” delivered to their “clients.” Like much of the rest of medicine, they talk about what the client wants rather than what he needs and measure themselves by “client satisfaction.” An anatomical pathologist is paid more for information than for judgment. If they correctly interpret a case based solely on the H and E, they make less than if they require a battery of ancillary tests to reach the same conclusion. In an odd twist, they are often considered more knowledgeable and thorough pathologists in the more lucrative scenario.^[5]

Specialists are believed to know more (in their fields) than generalists, and the patient exposed to the interpretation of the generalist is cautioned to seek a more informed opinion. The level of medicolegal risk, not to mention personal anxiety, among community practitioners has become so onerous as to stifle the individualism. Quite naturally, the majority of anatomic pathologists welcome guidance, guidelines, algorithms, checklist - anything that will increase their sense of security while helping to fulfill their professional mission.^[7]

The forces driving pathologic information are no longer controlled by pathologists. Gone are the days when clinicians were generalists and pathologists were defining disease. Those definitions are now well-known, and clinicians set the requirements. Given current trends, it may soon be the public that drives the system.^[7]

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