

Diagnostic Histopathology

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The twentieth century has seen histopathology develop into a major branch of clinical medicine. While surgeons and physicians continue to bear direct responsibility for the provision of clinical services, investigative and diagnostic specialists are now an integral part of the team that cares for patients. Histopathologists are increasingly involved in work that has a fundamental bearing on the immediate management of patients and are frequently party to therapeutic decisions. The modern histopathologist therefore requires both an intimate knowledge of biopsy appearances and the ability to interpret biopsies in the context of contemporary clinical practice. Before examining the various ways in which the histopathological interpretation of biopsies and surgical resections contributes to clinical practice, the origins of the discipline merit brief recapitulation.

Haruspicy, originating in ancient Babylon, was the art of foretelling the future by studying the organs of slaughtered animals. Some cryptic message latent within the entrails was translated by the haruspex and broadcast to the people (King and Meehan, 1973). The haruspex and the diagnostic histopathologist both prognosticate on information obtained from the examination of tissues. They differ only as do fancy and fact.

Origins of Histopathology

The history of histopathology can be divided into two phases. First, the simple recognition and description of the morbid changes in tissues associated with disease. Secondly, the use of such knowledge to identify a disease and to predict its behaviour and susceptibility to treatment in a living subject.

Claudius Galen (130-200) is generally acknowledged to be the first to have given detailed descriptions of the structural changes in the body associated with disease. He constructed a classification of tumours, lesions he attributed to an excess of black bile. In Italy, Marco Aurelio Severino (1580-1656) and Giovanni Battista Morgagni (1682-1771) pioneered the renaissance of morbid anatomy. Severino, in his illustrated book *De Recondite Abscessorum Natura* (1632), classified breast cancer into four different types. However, Morgagni is usually regarded as the founder of modern pathological anatomy. His work, based on a meticulous correlation of the clinical history and autopsy findings, was not merely descriptive but a genuine attempt to understand disease processes. The status of pathology as an independent

science was established by Matthew Baillie (1761-1823) with the publication in London of *The Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1793). An atlas followed a few years later. But it was not until the microscope was applied to the study of diseased tissues that information of potentially diagnostic value was obtained. Thin sections, necessary for microscopy, could only be cut if the tissue was hardened in some way to prevent deformation. Freezing was simple and effective; wax embedding was still many years away. Sir Everard Home (1763-1832) published pictures of the first histological sections of tumours in his book *A Short Tract on the Formation of Tumours* (1830), but derived few conclusions from them. In Germany, Johannes Muller (1801-1858) in *Über den Feinern Bau und die Formender Krankhaften Geschwülste* (1838) was able to distinguish different tumours by microscopy.

Among the earliest descriptions of the use of microscopy in the actual diagnosis of tumours and ulcers are those of Bennett (1845) working in Edinburgh, Scotland, and Donaldson (1853) of Baltimore, Maryland. They were the first to show that therapeutically useful information could be obtained from the microscopic examination of tumours and tumour-like lesions. Though they used smears rather than sections, Bennett and Donaldson were largely responsible for transforming human pathology from a purely descriptive discipline into an entirely novel diagnostic method. Their enthusiastic efforts mark the birth of diagnostic histopathology and cytology.

Another woman, 50 years of age, of cachectic appearance, had for six months an ulcer in the left breast. It was about an inch from the nipple, sunk deep into the substance of the organ, and was about the size of a walnut. Its edges and the surrounding substances were firm and indurated. The glands of the axilla were slightly enlarged. The right breast was healthy. It became a point to determine whether the ulcer was malignant or simple; whether an operation was or was not to be resorted to? An examination of the fluid upon the surface of the ulcer, with the microscope, exhibited- 1st. Pus cells, which, on the addition of acetic acid, presented the usual granular nucleus. 2nd. There were several flat scales, presenting all the character of pavement epithelium. 3rd. Were cells of an elongated form, similar to those observed in granulations, and cellular tissues in an early stage.

From these circumstances it was diagnosed that the ulcer was not malignant, and it subsequently disappeared under the use of common applications [Bennett, 1845, referring to the work of Professor Vogel of Munich].

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