Smears and Frozen Sections in Surgical Neuropathology

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Peter C. Burger’s new book is an excellent guide to intraoperative neuropathology consultation. It contains more than 650 pages of concise and informative text and more than 1,500 beautiful colored photomicrographs, gross intraoperative photographs, and black-and-white radiographic images. The text encompasses both basic instruction and advanced diagnostic insights and is thus well suited for the general surgical pathologist and neuropathology resident or fellow, as well as the experienced practitioner. Initial short chapters discuss important general concepts such as effective communication with the surgeon, specimen evaluation, techniques and advantages and disadvantages of smears and frozen sections, Dr. Burger’s basic diagnostic algorithm, certain problem scenarios during the intraoperative consultation, clinical and radiological considerations, and differential diagnosis by anatomical site and pathological features. The “Clinical and Radiological Considerations” chapter discusses radiological appearances of infiltrative and noninfiltrative tumors, cysts, and hemorrhages and steps to determining if the intraoperative sample is representative of the lesion. The “Differential Diagnosis by Anatomic Site” chapter lists lesions encountered in such areas as the meninges, cranial nerves, cerebral cortex, corpus callosum, intramedullary spinal compartment, and so on, whereas the “Differential Diagnosis by Pathological Features” chapter lists lesions associated with specific histological features, such as infiltrating growth, myxoid or mucoid background, chondroid architecture, or perivascular pseudorosettes, among others.

Photomicrographs are of high quality and are presented at optimal magnification to illustrate the salient features of lesions. Both technically good frozen sections and those with commonly encountered freeze and processing artifacts are shown. Indeed, the photomicrographs closely duplicate actual microscopic observing conditions! Avoidance of diagnostic pitfalls associated with misinterpretation of these artifacts or normal tissue is discussed in the last of the introductory chapters.

The subsequent succinct chapters (of the total of 77) examine every major diagnostic entity. Related lesions are logically grouped into 18 sections, such as “Infiltrating Gliomas,” “Embryonal Tumors,” “Lymphomas and Hematopoietic Tumors,” “Tumors of Cranial and Spinal Nerves,” and “Reactive and Inflammatory Lesions,” to name a few. Key cytological and histological features are listed in bullet form alongside multiple illustrations. Each figure is accompanied by a brief legend, so that each can be interpreted without referring back to the text. Multiple examples of cytological and histological variations of each major diagnosis are illustrated. For example, cellular, myxopapillary, clear cell, and giant cell subtypes of ependymoma, and classic, desmoplastic, anaplastic, medullomyoblastic, and melanotic medulloblastoma subtypes. Relatively new diagnostic entities such as angiocentric glioma and papillary glioneuronal tumor are also included, as are peripheral nerve lesions and non-CNS skull-based tumors such as pituitary adenoma, chordoma, and chondrosarcoma. Because of the inherent nature of intraoperative neuropathology, the book largely concerns neoplastic neurological disease but nonneoplastic conditions such as benign cysts, various pseudotumors, infection, infarcts, and demyelinating processes are also covered. As provided for the neoplastic entities, critical diagnostic features are discussed in short “Differential Diagnosis” subsections at the end of each chapter for specific lesions to help the reader avoid confusing these nonneoplastic lesions or mistaking them for neoplasms.

The text is both an excellent primer for the novice and a quick and straightforward recalibration for the fellowship-trained neuropathologist. It provides a complete catalog of case examples far exceeding an average neuropathology fellow’s worth of intraoperative smear and frozen-section experience. This book is, therefore, an excellent reference for any clinical setting incorporating a neurosurgical service and/or a postgraduate anatomical pathology training program. The text is so easy to use and so comprehensive that it could also be effectively used as an adjunct general surgical neuropathology text or used for board review.

Peter Burger’s vast clinical consultative and academic experience and his enormous impact on patient care and the advancement and teaching of surgical neuropathology are without parallel. He has contributed to more than 350 scientific papers and coauthored several important books including the Armed Forces Institute of Pathology’s CNS Tumor Fascicle and the classic text Surgical Pathology of the Nervous System and Its Coverings. Indeed, Dr. Burger is widely viewed as the definitive expert for consultation on a difficult-to-diagnose CNS tumor case. With his new book, Dr. Burger’s wealth of intraoperative consultative neuropathology experience, refined during an expanse of nearly 4 decades, can be at your fingertips in the office or frozen-section room in a well-organized quick-reference format. Many neuropathologists have a need for a practical, easy-to-use, and comprehensive guide to the interpretation of neuropathology smears and frozen sections. Dr. Burger has delivered. This book is without a doubt the definitive contemporary guide to intraoperative neuropathology consultation. And because Dr. Burger clearly intended his new book to be practical, I would be remiss not to mention that, for its price, it is also a tremendous bargain.

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