1 General Approach to Surgical Pathology Specimens

Safety in the Surgical Pathology Laboratory

The key to safety in the surgical pathology laboratory is to recognize that this area is a dangerous place. A variety of noxious chemicals are routinely used in the surgical pathology laboratory, and tissues infected with the human immunodeficiency virus (HIV), hepatitis viruses, mycobacteria, and other agents enter through its doors on a daily basis. Not only are these infectious agents present in the laboratory, but their transmission is also facilitated by the frequent handling of bloody tissues and the routine use of surgical blades, knives, saws, and other sharp instruments. Clearly, the surgical pathology laboratory is no place to “let down one’s guard” by becoming careless or distracted. Rather, safety in the work area should become an ingrained habit, and universal precautions should be exercised with all specimens.

Protective Gear

The prosector should regard all tissues as potentially infectious, not just those tissues removed from patients known to have an infectious disease. For the protection of oneself and for the safety of others, the prosector should wear protective gear in the cutting area at all times. Protective gear prevents contact of potentially infectious materials with the skin and mucous membranes, and it diminishes the transfer of infectious material outside of the surgical pathology laboratory. At the very least, protective gear should include surgical scrubs, waterproof shoe coverings, a surgical gown and/or waterproof forearm wraps, gloves, a cap, a mask, and eye protection. A waterproof apron should also be worn to prevent the absorption of fluids onto the clothing and skin. Hands should be protected by well-fitting surgical gloves. To prevent seepage of fluids, two pairs of gloves are preferred to one pair, and these gloves should be changed frequently. Keep in mind that even two pairs of gloves will not protect against punctures and cuts. Fine mesh metallic or synthetic gloves that are cut-resistant are recommended in those instances where one is unfamiliar with the use of a sharp instrument or when one is dissecting a specimen with sharp edges (e.g., a bone resection). Soiled or bloody garments and coverings should not be worn outside of the cutting area.

Disposal of Instruments and Trash, and Storage of Specimens

In order to avoid inadvertent wounds, there should be no more than one blade in the dissection field at any one time. Needles, razor blades, scalpel blades, and other sharp disposable objects should be promptly discarded into appropriate containers following their use. Trash items soiled with blood or other potentially infectious materials should be discarded into designated biohazard containers located in the cutting area. Upon completion of the dissection, the specimen should be stored in a container with adequate formalin. Specimen containers should be wiped clean of any potentially infectious materials, securely closed to prevent leakage, accurately labeled, and stored in a designated storage area.
In cases of known viral hepatitis, HIV infection, or tuberculosis, the cutting area should be washed clean and wiped with a disinfectant such as dilute bleach, and a biohazard label should be affixed to the specimen container.

Radioactive Specimens

With the increasing use of radioactive materials as a means to identify sentinel lymph nodes, the proper handling of radioactive materials has become an increasing concern in the surgical pathology laboratory. Although the risk of significant radiation exposure associated with these sentinel lymph nodes is believed to be very low, each institution should nonetheless develop written procedures for handling all radioactive specimens. These procedures should be developed in conjunction with the institution's radiation safety officer and should encompass issues related to the labeling, transportation, processing, storage, and disposal of radioactive specimens. The radiation safety officer is also responsible for training pathology personnel regarding safety issues. Do not be shy about contacting your institution's radiation safety office if you have questions about general policy issues or specific concerns regarding a radioactive specimen.

Fundamentals of Dissection

At first glance the challenges facing the surgical pathology cutter appear almost insurmountable. The types of specimens that come across the cutting table seem endlessly diverse, and the complexity of these specimens may at times be perplexing. To top it off, each specimen, whether a simple needle biopsy or a convoluted composite resection, must be handled with equal care and precision. How then does one confidently and effectively function in the surgical pathology laboratory, given the bewildering diversity and complexity of specimens that enter its doors? Where does one even begin?

For any specimen, the best place to begin is at the end. Even before making the first cut, take time to visualize the end result of your work, the surgical pathology report. Consider the issues that need to be addressed in that report, and then plan a dissection of the specimen that will help address these important issues. While it is true that no two specimens are exactly alike, you will find that the questions they pose are remarkably similar. Even the most complex of specimens can be reduced to three fundamental issues: What structures are present? What is the nature of the pathologic process? How extensive is that process? If you are not familiar with the important issues for a given organ, the Association of Directors of Anatomic and Surgical Pathology have an excellent website that summarizes the important diagnostic and prognostic issues for many of the major tumor types (www.panix.com/~adasp/). Regardless of the complexity or novelty of the specimen, these issues can be efficiently addressed by a systematic four-step approach. By mastering these four fundamental steps of surgical dissection, the surgical pathology cutter will be well equipped to tackle even the most intimidating of specimens with confidence.

Step 1. Specimen Orientation

If the surgical pathology report is the end result of the dissection, specimen orientation might be regarded as a road map by which to reach that ultimate destination. With orientation, an otherwise confusing conglomerate of tissue is placed in its proper clinical and anatomic context and appreciated as a structural unit. Then a proper course of dissection can be charted. Without orientation, specimen dissection can proceed speedily but may never reach its desired aims.

The Requisition Form

Orientation is usually thought of in terms of the structural anatomy of the specimen. While these anatomic considerations certainly are important, a specimen must also be understood in terms of its clinical context. No specimen should be dissected in a "clinical vacuum"; rather, a strategy for the dissection of any specimen should be directed by the clinical history. For example, a uterus removed for leiomyomas is handled very differently from one removed for cervical cancer. Fortunately, clinical orientation usually does not require a full review of the patient's medical chart. Instead, a pertinent clinical history can often be succinctly communicated through a requisition form (Appendix 1-A). The requisition