Chapter VI
Wedge Biopsy for Diffuse Lung Diseases

Wedge biopsy via thoracoscopic biopsy or open lung biopsy is occasionally performed to obtain tissue for the diagnosis of a diffuse lung disease. A wedge biopsy is more invasive and has higher risks of morbidity and mortality than other diagnostic procedures and the so only a minority of patients have circumstances that cause their pulmonologist or other clinician to request a wedge biopsy. In general, the patient is either severely acutely ill or is ill with a chronic disease that has eluded definitive diagnosis by more conservative means (clinical tests, imaging, cytology, transbronchial biopsy) and not responded to empirical treatments.

Since the decision to obtain a wedge biopsy has significant potential consequences and the patient is already in a difficult clinical situation, frozen section may be performed to confirm that the lung tissue sampled is appropriate for diagnostic purposes. Specifically, the intent of the frozen section is not to provide a diagnosis of a diffuse disease at the time of frozen section, but rather confirm that diagnostic tissue has been obtained that can be analyzed on permanent sections. Presumably if the wedge biopsy has not sampled appropriate or adequate tissue for diagnosis, then additional tissue should be sampled.

To address the question of whether the wedge biopsy represents diagnostic tissue, it is important for the pathologist to obtain clinical information from the pulmonologist or other informed clinician. The sample’s appropriateness depends on the clinical differential diagnosis and questions to be answered. In some cases, tissue for microbiologic cultures or other special studies may also be obtained at the time of wedge biopsy.

A description of the histopathologic features of all diffuse lung diseases is beyond the scope of this book. There are some basic concepts that the pathologist performing the frozen section will find helpful. Since the patient may be very ill, the surgeon may be hurried into taking a sample that is not representative of the disease...
process; for example, the lingula often protrudes as an easy target for excision, but may not be representative of the active disease. As much as possible, the surgeon should be encouraged to sample areas of active disease and rather than any lung tissue that happens to be surgically convenient. Obviously, normal lung tissue or tissue with end-stage fibrosis is not diagnostic. Tissue with active inflammation, acute injury, organization, or other features within the clinical differential diagnosis is necessary. Usually all that is required at frozen section is for the pathologist to confirm that lung tissue with active diffuse disease is present and further diagnosis is deferred for permanent sections.

In reviewing the frozen section for features of disease, the pathologist should be careful to avoid misinterpreting reactive atypia for malignancy as discussed in Chapter I. Rarely, diffuse interstitial lung disease is the result of lymphangitic spread of a cancer which may be sampled on frozen section. Examples of wedge biopsies that may be submitted for frozen section are illustrated in Figs. 6.1 through 6.5.

**Figure 6.1.** Medium-power view of a frozen section for a diffuse lung disease shows intra-alveolar collections of macrophages and eosinophils and interstitial thickening by edema, granulation tissue, and lymphocytes. This is clearly active disease and suitable specimen for evaluation on permanent sections later. This was later diagnosed as eosinophilic pneumonia.
Figure 6.2. Low-power view of a frozen section shows a wedge biopsy of lung parenchyma in which there are diffuse interstitial lymphocytic infiltrates. The wedge biopsy consists of lung tissue with active disease appropriate for further evaluation on permanent sections.
Figure 6.3. High-power view from a wedge biopsy frozen section containing neutrophils and granulation tissue. These features are consistent with an infection and, in addition, confirm that tissue with active disease has been sampled. Tissue should also be sent for microbiologic cultures.
Figure 6.4. There is considerable mature fibrosis in this wedge biopsy reviewed at frozen section. Biopsies of end-stage fibrosis are not of diagnostic utility because they do not represent diagnosable areas of active disease. However, it is important for the pathologist to know the clinical differential diagnosis and questions to be answered before making a decision on the suitability of the biopsy on frozen section. This biopsy was performed for a chronic idiopathic interstitial fibrosis that had a slightly atypical pattern on imaging studies. This biopsy shows a patchy pattern of fibrosis suggestive of usual interstitial pneumonia on frozen section and the pathologist indicated to the surgeon that appropriate tissue had been sampled. Other features of usual interstitial pneumonia such as fibroblast foci were identified on the permanent sections.
Figure 6.5. This patient presented with an interstitial infiltrate and underwent wedge biopsy when less invasive studies failed to confirm a specific disease. At frozen section, the patient was found to have lymphangitic spread of carcinoma. In this figure, there is a vessel filled with cytologically malignant carcinoma cells.