Practical Strategies to Improve the Clinical Utility of the Dermatopathology Report

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- **Context.**—Dermatologists and subspecialty dermatopathologists, working together over many years, develop a common understanding of clinical information provided on the requisition and of terminology used in the pathology report. Challenges arise for pathologists without additional subspecialty training in dermatology/dermatopathology, and for any pathologist reporting skin biopsies for nondermatologists such as general practitioners or surgeons.

  **Objective.**—To provide practical strategies to improve efficiency of dermatopathology sign-out, at the same time providing the clinician with clear diagnostic and prognostic information to guide patient management.

  **Data Sources.**—The information outlined in this review is based on our own experiences with routine dermatopathology and dermatology practice, and review of English-language articles related to the selected topics discussed.

  **Conclusions.**—Using generic diagnoses for some benign lesions, listing pertinent negatives in the pathology report, and using logical risk management strategies when reporting on basal cell carcinoma, partial biopsies, or specimens with incomplete clinical information allow the pathologist to convey relevant and useful diagnostic information to the treating clinician.

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The topics chosen reflect the authors’ experience based on intradepartmental consultation with general surgical pathology colleagues faced with challenges in dermatopathology reporting.

**IMPROVING EFFICIENCY—USEFUL GENERIC DIAGNOSES**

While clearly there are many, many important diagnoses rendered by a pathologist reporting skin biopsies, there are also a large proportion of specimens in which a definitive pathologic diagnosis is often not possible, but the likelihood of missing a malignant or clinically important lesion is remote. For such cases, accuracy/precision is relatively less important in terms of patient prognosis and care. It is very useful for the pathologist to have an armamentarium of “generic” or “non-specific” diagnosis she/he can use to sign out such cases expediently in a clinically useful manner.

**Benign Keratoses**

Classic patterns of seborrheic keratosis are easily diagnosed but many benign keratotic epidermal lesions seem to defy precise classification. For example, is the lesion a...
seborrhagic keratosis or a wart (Figure 1, A)? When such benign lesions are difficult to classify, the terms benign keratosis or verrucous keratosis can be very helpful (sometimes with inclusion of the pertinent negatives [see below]). For lesions that are not clinically keratotic, the term squamous papilloma can sometimes be used, especially at certain anatomic sites such as the eyelid where there is often considerable overlap between seborrhagic keratosis and a simple skin tag. Keratotic lesions that are “flat” histologically, with minimal epidermal thickening and no downward budding, can usefully be signed out as “seborrhagic keratosis, flat type,” “solar lentigo, flat type” (usually on sun-damaged skin of head and neck), or “large cell acanthoma” if the lesional keratinocytes are clearly markedly increased in size (Figure 1, B).

Lichenoid keratosis is a very common diagnosis with lesions most often occurring on the trunk and proximal upper limbs of middle-aged or older patients. The lesion represents a lichenoid reaction to a solar lentigo or seborrhagic keratosis. The clinical impression is often that of superficial basal cell carcinoma. Unless we are given a clear clinical history suggesting a lichenoid rash, then such a solitary lesion is almost always benign lichenoid keratosis (Figure 1, C). In our experience, this lesion often presents problems in classification for the nondermatopathologist.

Finally, endophytic-pattern benign keratoses and similar benign squamoproliferative lesions can sometimes defy precise classification and often overlap in their histologic features. Within this category, diagnoses may include irritated seborrhagic keratosis, inverted follicular keratosis, and endophytic pattern verruca vulgaris. When uncertain, “benign endophytic squamoproliferative lesion, negative for atypia” can usefully be used as a generic benign diagnosis for such lesions (Figure 1, D).

**Lentiginous Melanocytic Nevus**

Heavily pigmented melanocytic nevi are often biopsied. The pathology may show a lentiginous pattern nevus, sometimes purely junctional, associated with increased melanin pigmentation, sometimes with pigment transfer into overlying stratum corneum (“pigmented parakeratosis”) and melanophages in the dermis. Inexperienced pathologists sometimes confuse the histology of these nevi (also known as “hypermelanotic” nevi) with atypical or dysplastic pattern. Importantly, such nevi are not limited to young patients and are frequently seen in older individuals. “Lentiginous melanocytic nevus” (Figure 2, A through D) is a useful diagnosis to have in our repertoire. This pattern of nevus is easily recognized pathologically and indeed is often a “low-power” diagnosis with a brief examination at higher magnification to exclude marked melanocytic atypia or other worrisome features.

**Eczematous Dermatitis**

Dermatologists rarely biopsy an eczematous lesion to differentiate between clinical variants of spongiotic dermatitis, so it is sufficient for the pathologist to recognize epidermal spongiosis and to classify the inflammatory reaction pattern as “spongiotic.” Subtle clues, such as superficial dyskeratotic keratinocytes in contact dermatitis can be used, but in most circumstances, the diagnosis “spongiotic dermatitis” is sufficient information for the clinician to manage the patient. For the dermatologist, a more usual situation occurs when a papulosquamous condition looks like dermatitis but may have atypical clinical features, thus expanding the differential diagnosis to include conditions such as psoriasis, subacute cutaneous lupus, pityriasis rosea, dermatophyte infection, or mycosis fungoides. When the pathologic process shows spongiotic dermatitis but the clinical differential diagnosis is broader, then the addition of pertinent negatives to the pathology report is very useful to the dermatologist (see below). For example: “spongiotic dermatitis, fungal stain negative,” “spongiotic dermatitis, with features consistent with pityriasis rosea,” or “spongiotic dermatitis, negative for lymphocyte atypia or epidermotropism.”

**JUST SAY “NO”: LISTING THE PERTINENT NEGATIVES**

Including pertinent negatives in the diagnosis, microscopic description, or comment section of our pathology report is very useful. Absence of certain findings can eliminate broad categories within the clinical differential diagnosis and increase clinician confidence in the pathologist’s interpretation. Specifically excluding clinically suggested diagnoses (eg, “there are no histopathologic features of lupus erythematosus,” “basal cell carcinoma is not present,” “there is no evidence of granulomatous inflammation”) directly answers the clinician’s queried diagnoses noted on the requisition.

Pertinent negatives included in the report should be relevant to the clinical information provided. Even when the histopathology correlates well with the clinical impression, a short listing of relevant negative findings within the microscopic description or comment section is often appreciated by the submitting dermatologist, providing assurance that the slides have been carefully reviewed, and increasing their confidence in our report.

**Benign Melanocytic Lesions**

When a clinician biopsies or removes a clinically suspicious pigmented lesion, but the pathologic process shows an entirely benign pattern, then pertinent negative findings may be helpful in assuring the clinician that the pathologist reviewed the slides carefully and was aware of the clinical atypia. “No evidence of architectural or cytologic atypia,” “no evidence of pagetoid spread,” or “mitotic figures not seen” can all be useful phrases. For example, if the clinical diagnosis is melanoma in situ, but the pathologic diagnosis is benign compound melanocytic nevus, then the report might include phraseology such as “poorly demarcated lesion with mild architectural atypia only. No evidence of pagetoid spread or other features to suggest melanoma in situ.”

**Epidermal Lesions**

Pathology reports on epidermal tumors thought clinically to be either malignant (squamous cell carcinoma) or virally induced (condyoma acuminatum), but showing benign, noninvasive lesions, or nonspecific changes on biopsy, can also benefit from inclusion of pertinent negatives, such as negative for “atypia/dysplasia,” “full-thickness atypia,” “invasion,” or “viral cytopathic effect.” For example, if the clinical impression is condyoma acuminatum but the biopsy is not diagnostic, then “benign squamous papilloma; no definite human papillomavirus effect; no epidermal atypia” can reassure the clinician that the clinical diagnosis has been considered and that diagnostic features are not present histologically.
Nonneoplastic/Inflammatory Conditions

Incorporation of negative findings into the pathology report may effectively exclude one or more of a clinician’s differential diagnoses for a skin eruption or nonneoplastic condition. For example, if there is no lichenoid inflammation present histologically, the diagnosis is not lichen planus; absence of granulomata excludes sarcoidosis; lack of dermal mucin rules out a mucinosis. When certain inflammatory cells are absent, this should also be mentioned when relevant. For example, if the clinical diagnosis is insect bite reaction, urticaria, or bullous pemphigoid, the absence of eosinophils in the biopsy specimen should specifically be noted. The presence or absence of eosinophils can also be helpful in distinguishing a psoriasiform spongiotic reaction (often present) from psoriasis (absent), or a lichenoid drug reaction (present) (Figure 3, A and B) from lupus erythematosus (absent). Similarly for neutrophils in cases of suspected Sweet syndrome or other neutrophilic dermatosis and mast cells in cases of suspected urticaria pigmentosa. An example diagnosis for a patient suspected of having a lichenoid drug reaction might read “Nonspecific spongiotic dermatitis. No evidence of a lichenoid reaction. Eosinophils not present. Fungal stain negative.”

DEALING WITH INSUFFICIENT CLINICAL INFORMATION

Clinical information provided on the skin biopsy requisition is often lacking or suboptimal.1,10 Missing clinical information results in pathologist inefficiency, uncertainty in diagnosis, and physician stress. In a recent study,1 91% of dermatopathologists moderately or strongly agreed that vague clinical impressions or missing relevant clinical information makes them uneasy. Forty-four percent of respondents in this survey spent 30 minutes or more daily searching for relevant clinical information to assist histopathologic interpretation. Possible strategies to address lack of relevant clinical information are shown in the Table.

Useful Terminology

When no clinical information is provided (eg, requisition simply states “skin biopsy” or “lesion”), it is our practice to include a “disclaimer” in the diagnostic line, regardless of whether the biopsy is diagnostic or not. For example, when no clinical information is provided, and the pathologic process shows benign nevus, the diagnosis might read “intradermal melanocytic nevus (no clinical information provided).” In such cases, it is usually highly inefficient to spend time contacting the clinician for more information.
Figure 2. Lentiginous (hypermelanotic) melanocytic nevus. A, Downgrowth of rete ridges, small junctional nests, heavily pigmented epidermis, and melanophages. B, Varially sized small junctional nests with underlying melanophages. C, Melanin transfer into the stratum corneum (pigmented parakeratosis). D, Dysplastic junctional melanocytic nevus showing architectural atypia with bridging of irregular junctional nests (hematoxylin-eosin, original magnifications ×20 [A, B, and D] and ×100 [C]).

Figure 3. Importance of eosinophils in inflammatory dermatoses. A, Low power of interface dermatitis consistent with lichen planus. B, Numerous eosinophils (arrows) in the inflammatory infiltrate suggest the differential diagnosis of lichenoid drug eruption (hematoxylin-eosin, original magnifications ×20 [A] and 100 [B]).
It is essential that we use terminology that explicitly states both the partial nature of the biopsy and the diagnostic uncertainty because of the biopsy limitations (Figure 4, A through D). The terminology selected should reflect the level of concern held by the pathologist about a given lesion. For example, for a benign compound nevus or a “mildly atypical” nevus that has been partially transected by the biopsy and for which the risk to the patient is felt to be remote, a simple note appended to the diagnosis may suffice. For example: “Compound melanocytic nevus with mild atypia (partial biopsy)” (Figure 4, C). For more worrisome melanocytic lesions about which there is considerable concern, a comment similar to the following may be useful: “This atypical compound melanocytic proliferation involves both peripheral biopsy edges, and the findings may not be representative of the lesion as a whole.” Further recommendations including to “rebiopsy any residual or recurrent lesion at the site,” or “conservative reexcision recommended” should be provided. High also advises that pathologists should provide guidance to the clinician by suggesting biopsy techniques that are most likely to render the most accurate information (eg, recommending deep saucerization or conservative excision rather than shave biopsy).

An additional problem encountered concerns partial biopsies of melanocytic lesions for which the size of the lesion could significantly influence the pathologist’s concern about it. For example, broad lesions on acral skin are a source of greater concern than small, symmetric ones. Therefore, a partial biopsy of an acral melanocytic lesion for which a size of 3 mm has been provided by the clinician would be less concerning than one for which a size of 10 mm has been provided. In our opinion, the clinical size of a melanocytic lesion, especially if the biopsy is a partial sample, is essential clinical information that must be provided by the submitting physician. The absence of lesion size information should prompt a comment that “The size of the lesion has not been provided. Partial biopsies of melanocytic lesions may not be representative of the lesion as a whole.”

**Epidermal Lesions**

A very common problem in dermatopathology is the superficial biopsy of squamous proliferations. The superficial epidermal changes of many lesions can overlap; for example, the top of a basal cell carcinoma, an actinic keratosis, and an invasive squamous cell carcinoma, can all appear identical if only the superficial layers of the epidermis are examined.

Unfortunately, a definitive diagnosis may not be possible on specimens that are suboptimal/inadequate owing to biopsy technique (Figure 4, A and B). It is prudent to consider additional levels in an attempt to identify diagnostic features in these biopsies. However, if only superficial epidermis persists despite level sections, it is necessary to resort to descriptive diagnoses. If the biopsy has sampled only the top of a squamous lesion, options for the diagnostic line include “surface of an atypical squamous proliferation” or “dysplastic squamous lesion, transected at the base,” with an additional comment that a definitive diagnosis is not possible owing to the superficial biopsy. Some superficial biopsies of dysplastic squamous lesions would lend themselves to a diagnosis of “at least actinic keratosis, transected at the base, invasive squamous cell carcinoma cannot be excluded.” These diagnoses provide

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**Possible Strategies to Address Lack of Relevant Clinical Information**

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<td>• Request fax or scan of paper charts</td>
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<td>• Access to medical record</td>
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<td>Use “disclaimer” terminology at sign-out to highlight potential limitations because of limited clinical information</td>
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<td>Often restricted to laboratory information system</td>
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<td>Very helpful for inpatients if pathologist has access to PCIS</td>
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Abbreviation: PCIS, patient care information system.

The exception would be for partial biopsies or incomplete excisions (see below).

When the pathologic interpretation is less clear, and no further clinical information can be obtained from the patient’s physician, then generic phraseology is used (eg, “lichenoid reaction; see comment”). Within the comment section the inadequate or incomplete clinical information should be noted and any attempts to retrieve further clinical information, documented (eg, “there is no record of a previous biopsy in our laboratory information system”, or “voicemail left for Dr X at 1630 hours, May 6, 2015—addendum will be issued if further clinical information received”). Surprisingly, a recent study of reasons for addendum reports in surgical pathology does not list “receipt of further clinical information” as reason for an addendum to be issued.11

**THE INSUFFICIENT OR PARTIAL BIOPSY**

Not infrequently, the pathologist signing out skin biopsies will encounter specimens that have sampled only part of the lesion. This problem arises most commonly with superficial shave biopsies, which may lack even full-thickness epidermis, and with punch biopsies, where the lateral edges of the lesion often remain unsampled. Clearly, interpretation of these specimens risks misdiagnosis if the most salient histopathologic features are not present within the biopsy material.

**Melanocytic Lesions**

The odds of histopathologic misdiagnosis increases when assessing shave and punch biopsies of melanocytic lesions, as opposed to excisional biopsies.12 This risk is highest for partially sampled, broad asymmetric melanocytic lesions, where diagnostic features of melanoma may be missed adjacent to what otherwise appears to be an atypical or dysplastic nevus. The latter point is highlighted by High’s admonition to “beware of a partial biopsy” in his article on malpractice in dermatopathology.13
the clinicians with the information that the lesion appears to be squamous, that there is the possibility of a deeper lesion including invasive carcinoma that has not been sampled, and leaves them the option to rebiopsy or follow up the patient according to their degree of clinical suspicion about the lesion.

In all such cases, an attempt to make a diagnosis is appropriate, but we should not feel obligated to “stretch” ourselves to render a possibly incorrect diagnosis on an inadequate specimen. A descriptive diagnosis with a comment describing the biopsy limitations is appropriate.

**REPORTING MARGINS FOR BASAL CELL CARCINOMA**

Biopsies and excisions of basal cell carcinomas are among the most common dermatopathology specimens received. It has been repeatedly established that recurrences of basal cell carcinoma occur even when margins of the original biopsy are reported as negative; in contrast, many reexcisions of margin-positive basal cell carcinomas contain no residual tumor. In light of this, in excision specimens in which the visualized margin appears negative, it would be prudent to report this as “margins clear in the planes of examined sections,” which conveys to the clinician that the entire circumferential margin has not been examined.

Another possible source of missed positive margins occurs when the epithelial component of basal cell carcinoma is free of the margins, but the stromal reaction around the tumor extends to the margin (Figure 5, A and B). This is particularly a problem in superficial pattern basal cell carcinomas, which often show discontinuity in a given lesion, rather than a tumor with well-defined margins. According to LeBoit, stromal changes at the margin of a basal cell carcinoma most likely indicate that there is residual tumor beyond that margin. Likewise, a scar at the margin should be an indication that residual tumor may be left in the patient.

The recurrence of carcinoma in patients who had negative margins on the original procedure has been attributed to the “bread-loafing” technique used in grossing surgical pathology specimens, wherein the entire circumferential margin is not visualized and there is the potential to miss a focally positive margin.

Figure 4. Partial biopsies requiring caution in pathology sign-out. A, Partial sampling of an acral actinic keratosis, but invasive carcinoma cannot be excluded. B, Surface of a very keratotic squamoproliferative lesion, with minimal epidermis for evaluation. C, Superficial shave specimen of a junctional melanocytic proliferation, with no clinical description or lesion size provided. D, Superficial biopsy to rule out basal cell carcinoma or sebaceous hyperplasia; no lesion sampled, biopsy likely too superficial (hematoxylin-eosin, original magnifications ×20 [A through C] and ×40 [D]).
Basal cell carcinoma may be seen in the triangular specimen tips of a bread-loafed elliptical excision. Two options are available: (1) examine multiple deeper sections through the tissue block, or (2) consider the tip margins negative if the tumor is not present at the painted surgical resection margins. We favor option 2 because unless the entire ellipse is serially sectioned, it makes little sense to examine multiple deeper levels from the specimen tips.

In summary, the surgical pathologist should report margins on basal cell carcinoma with appropriate comment or warning regarding the possibility of a missed positive margin due to sampling error. If peritumoral stroma is seen at a margin, this should be reported with inclusion of a comment that stromal reaction at a margin is suspicious for an incompletely excised lesion. Finally, given various treatment measures used for basal cell carcinoma, both surgical and medical, it is advisable to report margins on this tumor, but recommendations regarding reexcision should be avoided, unless requested by the clinician.21

**CONCLUSIONS**

Using generic diagnoses for some benign lesions, listing pertinent negatives in the pathology report, and using logical risk management strategies when reporting on basal cell carcinoma, partial biopsies, or specimens with incomplete clinical information allow the pathologist to convey relevant and useful diagnostic information to the treating clinician and to sign out skin specimens in an efficient manner.

**References**


**Figure 5.** Stromal reactions adjacent to basal cell carcinoma (BCC) can make margin assessment difficult. A, Superficial pattern BCC: intervals between carcinoma nests are similar to the distance from nearest margin. B, Tumor stromal reaction at a painted margin (hematoxylin-eosin, original magnifications ×20 [A] and ×40 [B]).