

10 Things You Need to Know about Dermatopathology

Every podiatrist should learn these diagnostic keys.

BY WILLIAM P SCHERER, DPM, MS

1. Common Skin Cancers

Skin cancer of the lower extremities is significantly more common than what podiatrists have been taught in school, residencies, and medical seminars. Historically, our profession has been informed that the average podiatrist will encounter a malignant skin cancer once every five years or so, and according to a recent *PM News* survey of 869 podiatrists, 21% stated they have never diagnosed a melanoma. However, the average podiatrist is missing the diagnosis of skin cancer in their patients several times per year.

Of the almost 14,000 skin cancers diagnosed by podiatrists over a 10-year period, 56% were squamous cell carcinoma, 21% were basal cell carcinoma, 18% were malignant melanoma, and 6% were Kaposi sarcoma. The most proficient podiatrists diagnosing neoplasms are identifying an average of two malignancies per month. What are these doctors doing to diagnose so many neoplasms, especially when other podiatrists in their same community were not finding any malignancies? They perform comprehensive lower extremity skin examinations on all of their patients, and they specifically look for unusual lesions to biopsy.

Based on recent laboratory analysis, patients with skin cancer are presenting to the average podiatrist's office once every three to four months; however, podiatrists are missing the identification of skin cancer. Therefore, every podiatrist needs to be more vigilant towards diagnosing skin cancer by simply performing a

complete skin evaluation on every patient and performing a biopsy on suspected lesions.

Additionally, podiatrists should be aware that neoplasms will look completely different on patients with different skin complexions—e.g., squamous cell carcinoma is harder to detect on light-skinned individuals and melanoma is more difficult to detect on darker-skinned individuals.

is critical for treatment success. The most sensitive tests include Periodic Acid-Schiff (PAS), Gomori Methenamine Silver (GMS), and Fontana Masson (FM), while the most specific test includes DNA molecular testing (PCR assay). Using a comprehensive nail analysis approach by combining these four laboratory tests for onychomycosis will provide maximum diagnostic value for onychodystro-

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Most of the lower extremity skin cancer lesions presenting to podiatrists are asymptomatic, not painful, and are usually not part of the patient's chief complaint. The good news is that when a podiatrist diagnoses an early stage skin cancer (non-invasive and non-metastasized), the cure rate is 99% with excision.

2. Onychomycosis Diagnosis and Treatments

No matter how long a podiatrist has been in practice and no matter how many patients they have treated, diagnosing onychomycosis by visual inspection alone is inadequate and it is impossible to determine speciation without laboratory testing, and choosing the proper laboratory tests for diagnosing onychomycosis

phy, as this combination includes the most sensitive and specific tests available. If the cost of testing is a patient's primary concern, PAS alone is acceptable, but including GMS will provide improved sensitivity, especially for geriatric patients, and FM will help identify pigmented saprophytes.

Physicians who desire genus and species identification before prescribing topical or oral antifungal medications should utilize DNA testing (PCR Assay) as this provides the best granular diagnostic information and is far superior to fungal cultures. The success and cost of treating onychomycosis varies greatly and podiatrists should keep abreast on the latest developments.

Continued on page 102

Dermatopathology (from page 101)

Debridement of nails (CPT 11721) reimbursement varies by location, with a high of approximately \$58 in Alaska and a low of approximately \$42 in Mississippi. With one year of treatment, Jublia (efinaconazole) has the highest success rate of 54% for topical medications and costs \$1,150 for 8ml, Lamisil (Terbinafine) has the highest success rate of 70% for oral medications and costs \$0.30 per tab. Adjunct treatments such as thermal laser have a relatively low success rate of 11%, and UV sanitization of shoes and socks is still being studied.

3. Proper Nail Specimen Collection

The average laboratory positivity rates for toenail onychomycosis being submitted to the laboratory for diagnostic testing is slightly below 70%; however, the range of positivity is between a low of 20% to a high of 90%. Just because a toenail may look like onychomycosis upon visual inspection, there are many conditions that may cause thickening, brittleness, and dystrophy of the toenails that should be considered. Podiatrists who get consistently low positivity rates for onychomycosis should make sure that they are following proper nail specimen collection techniques such as discarding distal nail clippings, obtaining nail and subungual debris from the most proximal section of the nail unit possible, and submitting at least 6mm of tissue specimen for testing. Nail and subungual debris should be sent in a dry keratin plastic bag and not folded in gauze. Podiatrists should be aware that laboratories greatly prefer subungual debris, in addition to the nail plate, for diagnostic testing; and sending in distal nail clippings alone, without including subungual debris, will result in a lower than expected positivity for onychomycosis.

4. Punch Biopsy Confusion

Punch biopsies of suspected skin lesions should not include normal skin, yet the majority of podiatrists believe that they should include half diseased tissue and half normal skin with their punch biopsies. Derma-

topathologists prefer punch biopsy specimens that include only diseased tissue—although bullous lesions represent an exception, as the punch biopsy should include the area of attachment. According to laboratory statistics, the average podiatrist uses a 2mm punch biopsy approximately 85% of the time and a 3mm punch biopsy 15% of the time. Dermatopathologists prefer a 3mm specimen but consider a 2mm specimen minimally acceptable.

Additionally, using two 2mm punches (center and leading edge)

foot discomfort while sleeping are typical with patients suffering from SFPN. The most effective objective diagnostic test for making a definitive diagnosis of SFPN, and the degree of severity, is an epidermal nerve fiber density (ENFD) skin biopsy, performed 10 cm above the lateral malleoli, yet the average podiatrist only performs this diagnostic test once per year. EMG and NCVTs are primarily used to detect large fiber neuropathy, where ENFD analyzes the density of small nerve fibers and can be used by podiatrists to diagnose SFPN at an

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for a larger skin lesion is preferred over a single punch as it increases the odds of identifying causative pathology. There is no question that podiatrists “under-biopsy” with an average of 4 punch biopsies per year (Medicare data) as compared to dermatologists who perform, on average, 10 punch biopsies per day. This may partially be explained by considering that dermatologists generally biopsy lesions before instituting treatments, while podiatrists tend to prescribe various topical medications or surgically excise lesions when presented with unusual skin lesions, rather than perform a biopsy. Additionally, ablative procedures are contraindicated without performing a biopsy, as the tissue is destroyed, and there is no documented evidence of the pathology.

5. Small Fiber Peripheral Neuropathy

Small fiber peripheral neuropathy (SFPN) affects 20 million people in the U.S. and this condition is difficult to diagnose as muscle strength, reflexes, NCVT, and EMG tests will all be normal. Subjective complaints of intermittent pain, burning, and tingling sensations, along with a common complaint that bedsheets cause

early stage, when the symptoms may be mild. The most common treatments for SFPN include non-prescription dietary supplements and topical medications that can be dispensed directly from a podiatrist’s office and improvement is often seen with these treatments. ENFD testing was developed during the 1990s at Johns Hopkins School of Medicine. Podiatrists who have never performed an ENFD biopsy should learn this easy-to-perform technique as this will add a valuable service to their medical practices.

6. Chronic Ulcer Biopsy

Patients who present with foot, ankle, or lower extremity ulcers that are not improving after one month of proper wound care should be biopsied to rule out malignancies, and radiographic studies such as MRI should be ordered to rule out osteomyelitis. New patients presenting with a long history of non-healing ulcers and reporting failure of treatment from other doctors should be biopsied on the first visit. Ulcers should be debrided first, down to clean tissue, before performing a biopsy. Physicians should consider obtaining two biopsies, one at the

Continued on page 103

Dermatopathology (from page 102)

center of the ulcer and one at the edge of the ulcer, along with obtaining an eSwab for microbiology.

7. Soft Tissue Mass Biopsy

Podiatrists should not perform surgery to remove an unknown soft tissue mass without first knowing what the soft tissue mass is, as there have been multiple reports of foot and ankle conditions that appear to be ordinary ganglion cysts that are later diagnosed as soft tissue sarcomas. If a podiatrist performs surgery on a soft tissue mass, misidentifies a soft tissue sarcoma, and fails to take adequate margins, the risk of amputation dramatically increases, and these cases can lead to difficult-to-defend lawsuits. A fine needle aspiration biopsy procedure can be used to harvest cells and small fragments of tissue from a soft tissue mass or lesion in question. If a physician performs an aspirational biopsy on a soft tissue mass and has a “dry tap” where no fluid is obtained in the syringe, they should redirect the needle into the four quadrants of the soft tissue mass, while maintaining a vacuum in the syringe, then flush the needle in fixative (formalin or alcohol), and then flush the fixative back into the vial to submit to the laboratory. Under no circumstances should the needle be sent to the laboratory.

8. Skin Prep for Biopsy

Skin biopsies can easily be performed in an average podiatrist’s treatment room, as an operating room setting is not required, and skin preparation only requires a 10-second wipe with 70% isopropyl alcohol. Betadine or Hibiclens scrubs and sterile drapes are not required, local anesthesia consisting of 1cc of lidocaine with epinephrine is preferred to control bleeding, sutures are generally not required, 35% aluminum chloride is the hemostatic agent of choice, and applying a topical antibiotic and sterile bandage is recommended.

9. Tinea Incognito

Most podiatrists are surprised to learn that the use of topical Lotrisone cream (combination of antifungal and steroid) as a first line treatment for patients presenting with an itchy foot or ankle rash are increasing their patients’ risk of developing tinea incognito, a fungal infection that becomes masked and exacerbated by the application of a topical immunosuppressive agent. Tracey Vlahovic, DPM has long been an advocate for podiatrists to stop using Lotrisone as this can cause the fungal infection to lose some of the characteristic features of tinea due to the suppression of inflammation. Therefore, podiatrists should practice evidence-based medicine and make a definitive diagnosis of a patient’s skin condition, usually with a punch biopsy, before instituting a treatment plan, and then use appropriate medications (antifungal or anti-inflammatory) specifically targeting the disease once a proper diagnosis is made.

10. Dermoscopy

It seems that dermoscopy has become all the rage at several medical seminars, and well-known podia-

trists and manufacturing companies are heavily promoting their use in lower extremity skin examinations; however, podiatry seems to be slow to adopting this diagnostic tool. Dermoscopes have become a valuable instrument for many physicians, yet they are, in essence, glorified 10x magnifying glasses with a polarized and non-polarized light source. There can be a steep learning curve with differentiating benign and malignant skin lesions using dermoscopy. Podiatrists should consider using a dermatoscope in their practices; however, becoming proficient and attaining expertise takes time and practice. Experts recommend that you purchase the best dermatoscope you can afford, as inexpensive instruments contain very low quality optics that produce blurry images. One thing that is crystal clear about using a dermatoscope is that this medical device is just one tool to assist physicians to create a differential diagnosis for various skin lesions, but it definitely does not replace the need for a skin biopsy. **PM**



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