New and Hot Issues in Dermatologic Imaging

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Conflicts of Interest

• 3-gen
• Michelson Diagnostics Ltd
• Caliber ID
• LEO Pharma
• Amgen
• Valeant
• Galderma
• MELA Sciences
• Elsevier
• Lippincott, Williams & Wilkins
• Novartis
• DiaSorin

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What’s on your technology horizon? [JAAD, 2014]

Current Available Procedures:

• Dermoscopy
• Lugol Full Body Photography
• Mole Mapping
• Reflectance Confocal Microscopy
• Multispectral Imaging Device
• Optical Coherence Tomography

Recent Available Procedures: Not FDA approved

• Epidermal genetic information retrieval
• SolarScan
• Spectrophotometric Intracutaneous Analysis
• Electrical Impedance Spectroscopy
• Raman Spectroscopy
• Reflex Transmission Imaging
• FD-OCT with vessels Advance

Dermoscopy

• Contact or Non-Contact
• Polarized Light or Non-Polarized Light
Evolution of Melanoma Diagnosis from the Clinical ABCDE's

Non-Invasive Diagnosis: Pigmented Lesions & Melanoma

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Steps:

Clinical

Dermoscopic

Malignant
Benign
Lentigo
Melanoma in situ
Early Melanoma
Early SCC
Early BCC
Asymmetry of Dots & Lines accentuated at periphery

Granules around follicular openings
Overall Asymmetry

<table>
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<tr>
<th>SCC</th>
<th>Lentigo</th>
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<tbody>
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<td>MM</td>
<td>VS</td>
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Dermatology Practical Concepts: Oct 2014

The role of dermatoscopy and digital dermatoscopy follow-up in the clinical diagnosis of melanoma: clinical and dermatoscopic features of 39 consecutive primary melanomas.

- 60% MM’s detected with digital follow-up were In situ
  - Thinner
  - Non-ulcerated
- 40% MM’s in consultation —> SLNB
  - 6% stage III at diagnosis

CONCLUSION: The use of dermatoscopy and digital dermatoscopy allows the detection of MM’s in early stages, even in the absence of specific criteria for malignancy.

Brown Papule 1 month duration | MM 0.37mm thick

Blue white veil | MM (nodular)

MM (0.37 mm) Histology

Mollie’s Fund

1980-2000
Optical Coherence Tomography: FD-OCT, svOCT & RCM

Reflectance Confocal Microscopy (RCM)

Cosmet Microscopy: A Case Differentiating Lichen Planus-Like Keratosis (LPLK) from Lentigo Maligna Melanoma in Situ (MMIS) on the Face

CONFOCOL MICROSCOPY

The device is only good for certain lesions, and that’s why you have to be a dermatologist to be able to classify and categorize those lesions appropriately.

References:

Non-Invasive Devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Cellular Resolution</th>
<th>Depth</th>
<th>Field of View</th>
</tr>
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<tbody>
<tr>
<td>RCM</td>
<td>1 μm</td>
<td>250 μm</td>
<td>500 μm x 500 μm</td>
</tr>
<tr>
<td>HD-OCT</td>
<td>3 μm</td>
<td>570 μm</td>
<td>1800 μm x 1500 μm</td>
</tr>
<tr>
<td>FD-OCT</td>
<td>7.5 μm</td>
<td>1500 μm - 2000 μm</td>
<td>6000 μm x 6000 μm</td>
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<tr>
<td>Ultrasound</td>
<td>&lt; 1 mm</td>
<td>6000 μm</td>
<td>12000 μm</td>
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Advanced BCC: Sonic Hedgehog Inhibitor Rx

Baseline

Histology

<1 MM

6 mos

 Advanced BCC

Baseline

Histology

2 MM

Post treatment

Histology
Field cancerization refers to DNA damage in the keratinocytes due to chronic ultraviolet radiation. This damage can either moderate or severe LSR in the original study, there were only three patients in the extension who experienced the same. While there were 11 patients who experienced a “mild” reaction, whereas there were twelve patients who were willing to enroll in the extension study or still qualified for the study. Only those who had no additional treatments on their AKs following the original study could qualify for the extension, and many patients had previously untreated lesions (D, E, F and adjacent subclinical lesions (Aadj, Badj, Cadj)

There were a total of five lesions that had been treated and cleared during the original study recurred at the beginning of the extension study. These lesions exhibited features of SK that can cause the lesion to be unsuitable for treatment due to the presence of BCC. These lesions can also be seen on OCT images to assess the behavior of the field over an extended period of time.

Another likely possibility that could account for the discrepancy is the fact that patients in the extension study had lower clearance rates compared to the original study remained largely clear at the start of, and throughout the study.

In the extension study had lower clearance rates compared to the original study. The previously untreated lesions (D, E, F and adjacent subclinical lesions (Aadj, Badj, Cadj) were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study. It is possible that the extension study were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study. It is possible that the extension study were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study.

Field cancerization is a term that describes the presence of genetic abnormalities in qualifying patients (95% CI: 69.28%-96.24), p-value < 0.0001. In the original study, 91.3% of clinical AK lesions successfully treated in the original study were re-evaluated clinically and with the OCT at baseline and at day 60 following treatment that they applied at home. The previously evaluated clinically and with the OCT at baseline and at day 60 during the original study and in the extension study.

Conclusion: There was no statistical significance between the original and extension study. The OCT diagnosis of the lesions were compared to that of the original study and the extension study.

DISCUSSION

Chi-squared test in order to determine statistical difference between the two studies. The results showed that there was no statistical significance between the original and extension study. The OCT diagnosis of the lesions were compared to that of the original study and the extension study.

The clinical lesions (A, B, C) and subclinical AK lesions that did respond to treatment in qualifying patients (95% CI: 69.28%-96.24), p-value < 0.0001. This finding suggests that AKs that are treated correctly and respond well to treatment are likely to be in the context of an AK for a Fourier domain OCT diagnosis of the lesions were compared to that of the original study and the extension study.

Figure 2.

Figure 2. In the original study, 91.3% of clinical AK lesions successfully treated in the original study were re-evaluated clinically and with the OCT at baseline and at day 60 following treatment that they applied at home. The previously untreated lesions (D, E, F and adjacent subclinical lesions (Aadj, Badj, Cadj) were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study. It is possible that the extension study were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study. It is possible that the extension study were given the ingenol mebutate 0.015% to be applied at home for three days, whereas the medication was applied in the clinic by skilled research personnel in the original study.
Dermoscopy vs svOCT: Facial Skin Colored Papules

Dermoscopy vs svOCT: Pigmented Macules

Dermoscopy vs svOCT: Hyperpigmented Lesions

Non-Invasive svOCT: Absorption
svOCT: Pre and post alcohol placement on cracked nail

Pre- alcohol  Post- alcohol

svOCT: Pre and post alcohol placement on cracked nail

Pre- alcohol  Post- alcohol

svOCT: Arthropod bite injected with ILK 10

Before  Immediately After  1 Hour After

Psoriasis vs Onychomycosis (PAS +)

Summary: New and Hot Issues in Dermatologic Imaging

- Step 1 Clinical exam ABCDE’s of MM
- Step 2 Dermoscopy: Color Wheel approach combining Clinical & Dermoscopic
- Step 3 Non-invasive technology
- Review of approved Devices Properties and purpose
  - Depth vs Cellular Clarity
  - Field of View vs aperture
- New Research with newer dynamic OCT software
  - Pigmented Lesions
  - Absorption
  - Nail OM & PS