Abstract N°: 214

Measurement of surface textures in dermatology - A review

Aleksandra Frątczak[1], Zuzanna Pawlus[2], Bartosz Miziołek[1], Beata Bergler-Czop[1]

[1]Chair and Department of Dermatology, Medical University of Silesia, Katowice, Poland, Katowice, Poland
[2]Students' Scientific Association at the Chair and Department of Dermatology, Medical University of Silesia, Katowice, Poland, Katowice, Poland

**

Introduction and Objectives:

Surface topography is mainly measured in mechanical engineering. It affects functional properties of machine elements. Measurement of surface texture is also important in medicine, especially in dermatology. In this paper, methods of surface texture measurement and analysis in dermatology were reviewed. Applications of surface texture measurements in dermatology were also presented.

Materials and Methods:

The authors conducted research in PubMed and EMBASE databases on measurement of surface textures in dermatology. Searching was as broad as possible from the inception of the database until October 2024 including EMTREE and MESH approaches, conducted according to the PRISMA guidelines. A search was managed using the key terms: 'skin', 'surface texture' and 'measurement'. Information received from the above search was used in the compilation of the present article. About 149 studies were selected and reviewed.

Results:

Initially, assessment of surface texture in dermatology was conducted using replicas. Measurement of surface replicas was performed using methods applied in mechanical engineering. Surface topography measuring instruments were developed especially for measuring roughness of skin replicas. Recently, the measurement of skin surface in vivo has been more popular than measurement of replicas. PRIMOS and Visioscan are the most popular devices commercially available. Surface texture measurement can be obtained using polarisation imaging, reflectance confocal microscopy or optical coherence tomography. Skin micro relief can be studied using dermoscopy devices or cameras. Roughness height, wrinkles depth, width, and anisotropy increase with age, while wrinkles density and number of closed polygons decrease with age. Cosmetic use caused improvement of skin surface texture mainly by decrease in skin roughness height.

Conclusions:

Skin surface topography changes with age, the presence of various skin injuries or diseases, and the application of skin care products. Therefore developing modern techniques for skin surface measurement and analysis is needed. Surface roughness measurement can be helpful for detect skin diseases presence and development.

Abstract N°: 231

The role of high-frequency ultrasound scanning in the evaluation of age-related skin changes.

Ilona Nazarova[1], Ulugbek Sabirov[1], Nigora Khodjaeva[1], Gulnara Babakulova[1]

[1]Republican specialized scientific and practical medical center of dermatovenereology and cosmetology, Dermatocosmetology, Tashkent, Uzbekistan

Introduction & Objectives: For the last few years, ultrasound diagnostics in cosmetology has been actively developing. The attention of scientists is focused on complications after cosmetic procedures. High-frequency ultrasound can be used as a biomicroscope for multimodal in vivo skin examination, including accurate images of tissue structure, assessment of blood flow and elasticity. Skin thickness differs in different areas of the face and changes with age, accordingly should be considered when planning device and injectable aesthetic procedures. Deficiency or absence of subcutaneous fatty tissue increases the risk of hypercorrection during filler injections or thread implantation, vascular complications and scarring during anti-aging procedures. The aim of the study was to evaluate the diagnostic efficiency of high-frequency ultrasound scanning in topical diagnosis of age-related skin changes.

Materials & Methods: Thirty-five female patients with signs of skin aging aged 30 to 70 years were under observation. High-frequency ultrasound diagnostics was performed at 33MHz and 75MHz frequencies. The state of skin microrelief, epidermis and dermis thickness, acoustic density of epidermis and dermis at 4 fixed points on the facial skin were studied.

Results: According to the scanning results, there is a tendency for the epidermis microrelief to increase with age mainly in the area around the eyes and nasolabial fold by an average of 20%. Wrinkles were visualized as a wedge-shaped defect of skin relief, epidermis thickness in the wrinkle area is uneven, as a rule, epidermis is thicker at the bottom of the wrinkle and thinner at the edges. A significant decrease in dermal thickness was observed at all measured points on the facial skin of age-matched patients, predominantly in the forehead and around the eyes by 32% and 40%, respectively. In the upper layers of the dermis, acoustic density was reduced to an average of 8 units due to atrophy, and in the lower layers of the dermis, a triangular-shaped hyperechogenic area of up to 45 units resembling a mirror image of a wrinkle was observed. Within the hyperechogenic area thickened bundles of collagen fibers are visualized. Such structural changes in the deep layers of the dermis are explained by chronic deformation of the tissue during contraction of mimic muscles. In the age groups, insignificant changes in the acoustic density of the epidermis were observed, while the acoustic density of the dermis decreased by more than 27%, mainly in the papillary layer.

Conclusion: Objective assessment of skin aging markers by high-frequency ultrasound scanning can be recommended for primary examination of cosmetology patients in order to determine the degree of severity of age-related skin changes and subsequent control of safe performance of cosmetology injection and device anti-aging procedures in real time with maximum comfort for patients.

Abstract N°: 235

Favourable outcomes of oral drug provocation in patients with suspected drug reaction to anti-tubercular therapy: Results from a tertiary care centre.

Sushruta Kathuria*[1]

[1]safdarjung Hospital and Vardhaman Mahavir Medical college, New Delhi, India

Favourable outcomes of oral drug provocation in patients with suspected drug reaction to anti-tubercular therapy: Results from a tertiary care centre.

Introduction & Objectives:

Cutaneous adverse drug reactions to antitubercular therapy(ATT) is common presenting with varied manifestation such as maculopapular drug reaction, drug reaction with eosinophilia and systemic symptoms, lichenoid drug reaction and toxic epidermal necrolysis. The gold standard for confirming drug reactions is oral provocation testing. The aim of this study was to identify the drug in patients with suspected drug reaction to ATT and reintroduce it.

Materials & Methods:

All consenting patients with suspected drug reaction to ATT were recruited during period August 2022 to August 2024. Skin biopsy for histopathology, complete blood counts, biochemical tests, absolute eosinophil counts were done. The process of oral drug provocation was explained and done under admission. The protocol for oral drug provocation of ATT is standardized and done routinely in the department.

Results:

Out of 71 patients with drug reactions, in 19 patients, ATT was suspected as the culprit drug. Thirteen were provoked and their results are mentioned. The type of drug reaction was maculopapular drug rash in 12 and discoid lupus erythematous in 1. ATT was needed for pulmonary TB in 8, abdominal TB in 3, bone tb in 1 and TB lymphadenitis in 1. All patients had first episode. The first lesion appeared 3 days to 10 weeks after starting ATT. Total leucocyte count was raised in 5, abnormal absolute eosinophil count (between 600-750 cells/µl) was seen in 3, and no abnormality in blood was seen in 8. In 6/12 maculopapular rash cases, histopathology showed spongiosis and eosinophils while in 6/12 cases of maculopapular rash, skin biopsy was not done due to absence of lesions or patient refused. Histopathology of patient with DLE was compatible with DLE. The suspected drug on oral provocation was found to be isoniazid in 2, ethambutol in 2, rifampicin in 1, both isoniazid and rifampicin in 1, both isoniazid and pyrazinamide in 1, both rifampicin and ethambutol in 1 and all three isoniazid, rifampicin and pyrazinamide in 1. Non-ATT drugs such as diclofenac, cotrimoxazole and etoricoxib were found in 1 each and in 1 patient, no drug was found.

Conclusion:

In 9 patients with antitubercular drug found as the culprit drug, modified ATT was started and continued. In 4 patients where non-ATT drug or no drug was found, conventional ATT was resumed. Oral drug provocation is a safe and effective way for reintroduction of ATT in patients with suspected drug reaction to ATT. it should be done under supervision and it helps in patients being able to complete therapy by omitting just one or two drugs rather than changing the entire regimen.

Abstract N°: 383

Melanoma detection enhanced by dynamic optical coherence tomography

Carmen Cantisani[1], Giovanni Paolino[2], Antonio Di Guardo[1], Pawel Pietkiewicz[3], Emanuele Rovaldi[1], Giulia Azzella[1], Luca Gargano[1], Mariano Suppa[4], Salvador Gonzalez[5], Giovanni Pellacani[1]

[1]"Sapienza" University of Rome, Italy., Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, UOC of Dermatology, Italy, Italy

[2]Metropolitan City of Milan, Dermatologic Unit, Milan, Italy

[3]Zwierzyniecka Medical Center, Poznań, Poland, Poznan, Poland

[4]Hôpitaux universitaires de Bruxelles (HUB), Brussels, Belgium , 4. Department of Dermatology, Hôpital Erasme , Brussels, Belgium , Bruxelles, Belgium

[5]Alcala University, Madrid, Spain, Medicine and Medical specialties Department, Alcala University, Madrid, Spain, Madrid, Spain

Title: Melanoma detection enhanced by dynamic optical coherence tomography

Cantisani C1*, Paolino G2, Di Guardo A1, Pietkiewicz P3, Rovaldi E1, Azzella G1, Gargano L1, Suppa M4, Soda G5, Gonzalez S 6and Pellacani G1.

\1. UOC of Dermatology, Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, "Sapienza" University of Rome, Italy.

\2. Unit of Dermatology, IRCCS San Raffaele Hospital, Milano, Italy.

\3. Zwierzyniecka Medical Center, Poznań, Poland.

\4. Department of Dermatology, Hôpital Erasme – Hôpitaux universitaires de Bruxelles (HUB), Brussels, Belgium

\5. Department of Molecular Medicine, Policlinico Umberto I, Sapienza University of Rome, Rome, Italy

\6. Medicine and Medical specialties Department, Alcala University, Madrid, Spain

Introduction & Objectives:

The incidence of melanoma continues to rise rapidly, albeit the early diagnosis and new treatments option has improved its prognosis. Thin melanomas can be cured by surgical treatment, whereas thicker melanomas are typified by higher risk of metastatic disease and remain more challenging to treat. Since tumour characteristics can only be assessed with pathology, recently, rapid advancements in non-invasive in vivo technologies have revolutionized the diagnosis of early-stage melanoma. We investigated dynamic optical coherence tomography (D-OCT) characteristics in pathology-confirmed melanoma suspects.

Materials and methods: We retrospectively evaluated medical data of adult patients, presenting to non-invasive diagnostic imaging outpatient clinic at Policlinico Umberto I in Rome, Italy, with a tentative diagnosis of melanoma. All lesions were selected upon clinical/dermatoscopic/reflectance confocal microscopy (RCM) findings, and underwent D-OCT imaging (VivoSight Dx, Michelson Diagnostics Ltd, UK) before being confirmed with pathology. We analysed overall morphology of the dermis and epidermis, reflectivity, and aspect of the dermo epithelial-junction. Additionally, for each selected lesion, we used VivoTools software (VivoSight®; Michelson Diagnostics, Maidstone, UK) for quantitative analysis of the OCT scans and that extracted average vessel diameter and density-versus-depth profile at a fixed depth of 300 µm, epidermal thickness, and other parameters, including dermal brightness calculated based on the intensity of the

backscattered light from the dermal layer of the skin

Results: 45 melanomas and 5 nevi were diagnosed in 40 patients (male/female ratio 1:1, with a mean age of 61)*En face* D-OCT showed dotted vessels in 84% of melanomas, followed by linear vessels in 31%, blob and serpiginous in 23% while arborising in 20%. While, D-OCT showed prevalence of blob vessels and mesh pattern in nevi. Melanomas *in situ* displayed a mean plex-depth of 288 µm, 38 diameter µm and 1.3% vessel density with a linear mottled pattern, bridging and pagetoid spread on transversal planes. In a single nodular melanoma, 3D vessel evaluation showed large serpiginous vessels with a depth of 136 µm, diameter 76 µm and density 4.6%.

Conclusion: Dynamic optical coherence tomography shows promise in enhancing melanoma detection, by providing detailed transversal information comparable to histopathology and vascular insights that complement existing non-invasive imaging techniques. By non-invasive assessment of Breslow and metastatic risk, it has a potential to guide treatment decisions.

Abstract N°: 556

Non-invasive diagnostic imaging in Kaposi sarcoma

Carmen Cantisani*[1], Antonio Di Guardo[1], Alberto Taliano[1], Emanuele Rovaldi[1], Mariano Suppa[2], Andrea Ascione[3], Giuseppe Soda[3], Steven Paul Nisticò[1], Giovanni Pellacani[1]

[1]"Sapienza" University of Rome, Italy., Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, Rome, Italy

[2]Hôpitaux universitaires de Bruxelles (HUB), Brussels, , Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, Bruxelles, Belgium

[3]Sapienza University of Rome, Department of Molecular Medicine, Rome, Italy

Non-invasive diagnostic imaging in Kaposi sarcoma

Cantisani C1, Di Guardo A1, Taliano A1,Rovaldi E1, Suppa M2, Ascione A3, Soda G3, Nisticò S1 and Pellacani G1.

1.UOC of Dermatology, Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, "Sapienza" University of Rome, Italy.

2.Department of Dermatology, Hôpital Erasme – Hôpitaux universitaires de Bruxelles (HUB), Brussels, Belgium

\3. Department of Molecular Medicine, Policlinico Umberto I, Sapienza University of Rome, Rome, Italy

Introduction & Objectives: Kaposi sarcoma (KS) is a rare angio-proliferative mesenchymal neoplasm able to create masses on the skin, lymph nodes and other organs. Cutaneous lesion can be characterized by the presence of painless or painful red-purple-brown papules, nodes to plaques, in single or multiple body's areas, with cosmetic disfiguring aspect. It is usually correlated to immune suppression, and it may worsen gradually or fast with significant mortality and morbidity. Associated often to human herpesvirus-8 (HHV-8). Despite being a low-grade tumor, Kaposi sarcoma lesions may involve all organs and anatomic locations, but they predominantly affect skin and mucosal surfaces. There are four clinic-epidemiological variants of KS: classic, African (endemic), AIDS-associated (epidemic), and iatrogenic KS. Males are more frequently affected then females. It is present worldwide but is endemic in some countries in southern and eastern Africa.

Materials and methods: Non-invasive diagnostic techniques, such as dermoscopy, dynamic optical coherence tomography and LC-OCT, help in the characterization of this tumor; however, diagnosis remains to be established through a clinical and histological evaluation. We described a case of Kaposi sarcoma HHV 8 negative, evaluated with non-invasive diagnostic imaging.

Conclusion: Non-invasive diagnostic techniques are able to show typical Kaposi aspects such as bluish-reddish coloration rainbow dermoscopic pattern, or high vascularity and vascular channels surrounded by capsule with bruise-like aspect and LC-OCT infiltrative solid tumor with spindled endothelial cells, severe inflammation and dilatated and irregular vascular channels, with atypical lymphatic endothelium. They can be useful for early diagnosis but even for treatment follow-up.

Keywords: dynamic optical coherence tomography-herpes virus 8- line field optical coherence tomography-Kaposi sarcoma.

References

Lage SL, Ramaswami R, Rocco JM, Rupert A, Davis DA, Lurain K, Manion M, Whitby D, Yarchoan R, Sereti I. Inflammasome activation in patients with Kaposi sarcoma herpesvirus-associated diseases. Blood. 2024 Oct 3;144(14):1496-1507. doi: 10.1182/blood.2024024144. PMID: 38941593; PMCID: PMC11474434.

Dittmer DP. Is inflammation key in Kaposi sarcoma? Blood. 2024 Oct 3;144(14):1464-1465. doi: 10.1182/blood.2024025829. PMID: 39361305; PMCID: PMC11473398.

Tognetti L, Carraro A, Lamberti A, Cinotti E, Suppa M, Luc Perrot J, Rubegni P. Kaposi sarcoma of the glans: New findings by line field confocal optical coherence tomography examination. Skin Res Technol. 2021 Mar;27(2):285-287. doi: 10.1111/srt.12938. Epub 2020 Jul 23. PMID: 32700774.

Abstract N°: 638

A new approach to monitoring skin lesions in patients with mycosis fungoides.

Juliya Vinogradova[1], Daria Kozlova[1, 2], Denis Zaslavsky[2], Alexey Taganov[3], Elizaveta D. Zaslavskaya[2], Nikolay Ilyin[1]

[1]Russian Research Center for Radiology and Surgical Technologies named after Academician A.M. Granov, Saint-Petersburg, Russian Federation

[2]Saint-Petersburg State Pediatric Medical University, Dermatovenereology, Saint-Petersburg, Russian Federation

[3]French clinic of skin diseases named after Pierre Wolkenstein, Dermatovenereology, Saint-Petersburg, Russian Federation

Introduction & Objectives: Mycosis fungoides (MF) is a lymphoproliferative disease, the main clinical manifestation of which is skin lesions. Doctors of various specialties take part in the management of patients with MF: dermatologists, oncologists, hematologists, chemotherapists, radiotherapists, and sometimes, the correct determination of skin lesions and their dynamics is difficult for doctors, therefore, it is necessary to develop simple universal methods that increase the accuracy of determining the condition of the patient's skin directly during the appointment and in dynamics.

Materials & Methods: using the analysis of the color and structure of the most common skin lesions in patients with MF (clinical photographs and dermatoscopic images of lesions), to develop a specialized universal, compact and easy-to-use tool that allows determining the color and area of rash elements in patients with MF, as well as the dynamics of these parameters.

Results: on the base of the A.M. Granov Russian Research Center for Radiology and Surgical Technologies, a specialized Dermoscore #3 MF scale was developed for assessing skin lesions in patients with MF. The device has a transparent plastic base, length is 8 cm, width is 5.4 cm (credit card size), it contain 3 colorimetric scales (acute erythema - from pink to bright red, stagnant erythema - from purple to red with a bluish tint, and pigmentation from beige to brown) taking into account pathological changes in the skin in patients with MF, a centimeter ruler from 0 to 6 cm, as well as a 3x6 cm grid for a more accurate assessment of the lesions, while full area of the device is 45.9 cm2. The use of the device in the management of patients with MF helps to visually assess the dynamics of the level of acute erythema, stagnant erythema (cyanosis) and pigmentation within the lesions by simply applying color scales to the patient's skin. The grid for determining the area can be used to assess local lesions that can be recorded in MF, such as spots, ulcers, nodes and plaques. Also, device will simplify the assessment of the total area of the skin lesion, since it can also be used as a scaling object for photographing patients. This device can also be used for vitropressure by pressing its transparent area onto the lesion to assess the condition of the vessels due to the dense structure of the device, as well as skin scraping with its sharp edge.

Conclusion: The device Dermoscore #3 MF can become a useful tool in the management of patients with MF for doctors of various specialties who can participate in the treatment of patients in this category. This device will simplify the assessment of clinical manifestations of MF, as well as the assessment of their dynamics.

Abstract N°: 700

stages of training neural networks for detection and classification of skin neoplasms

Ksenia Uskova[1], Irena Shlivko[1], Oksana Garanina[1], Irina Klemenova[1], Anna Mironycheva[1], Ksenia Strokina[1]

[1]Nizhny Novgorod, Nizhny Novgorod, Russian Federation

Introduction & Objectives: In recent years, neural networks have become indispensable tools across various domains, including medicine. The performance of these models is intrinsically tied to the quality of the training datasets. The creation and curation of robust training datasets represent a vital step in the implementation of reliable neural network models.

Identify key training stages required for a deep convolutional neural network (CNN) to achieve high sensitivity and specificity in the classification of skin neoplasms clinical images.

Materials & Methods: A comprehensive database of 7,680 digital clinical images of skin neoplasms was compiled from 6,892 patients with verified diagnoses between 2017 and 2019. The dataset contains 5,316 cases (55.53%) confirmed through histopathological examination and 2,364 cases (44.47%) confirmed clinically and via dermatoscopic analysis. The dataset was divided into 6,000 images for training and validation and 1,680 images for testing. Performance metrics, including sensitivity, specificity, and accuracy, were evaluated.

The initial CNN model (CNN-A) for multi-class classification (melanoma, basal cell carcinoma, seborrheic keratosis, and nevi) achieved suboptimal performance: sensitivity (70.47%), specificity (79.86%), and accuracy (74.68%). To enhance these outcomes, the follwoing key improvements were introduced for CNN-B model:

1. implementation of image quality control methods;
2. integration of an object detection model to focus on lesion areas;
3. additional training of the CNN model using the preprocessed dataset.

Results: The enhanced model (CNN-B) demonstrated significant improvements, achieving sensitivity of 85.32–86.97% and specificity of 87.59–88.92%. These performance metrics surpass the diagnostic capabilities of non-specialist physicians relying on unaided visual examination, making the model suitable for population-based screening.

Conclusion: The application of artificial intelligence (AI) in medicine necessitates high-performance standards for neural networks models. Training on large volumes of unprocessed images proved insufficient for optimal results. By incorporating data preprocessing steps such as quality control and object detection, significant performance gains were achieved. This improvement underscores the potential of AI as a reliable tool for population-level screening of skin neoplasms.

Abstract N°: 740

stages of training neural networks for detection and classification of skin neoplasms

Ксения Ускова[1], Irena Shlivko[1], Oksana Garanina[1], Irina Klemenova[1], Anna Mironycheva[1], Ksenia Strokina[1]

[1]Nizhny Novgorod, Nizhny Novgorod, Russian Federation

Introduction & Objectives: In recent years, neural networks have become indispensable tools across various domains, including medicine. The performance of these models is intrinsically tied to the quality of the training datasets. The creation and curation of robust training datasets represent a vital step in the implementation of reliable neural network models.

Identify key training stages required for a deep convolutional neural network (CNN) to achieve high sensitivity and specificity in the classification of skin neoplasms clinical images.

Materials & Methods: A comprehensive database of 7,680 digital clinical images of skin neoplasms was compiled from 6,892 patients with verified diagnoses between 2017 and 2019. The dataset contains 5,316 cases (55.53%) confirmed through histopathological examination and 2,364 cases (44.47%) confirmed clinically and via dermatoscopic analysis. The dataset was divided into 6,000 images for training and validation and 1,680 images for testing. Performance metrics, including sensitivity, specificity, and accuracy, were evaluated.

The initial CNN model (CNN-A) for multi-class classification (melanoma, basal cell carcinoma, seborrheic keratosis, and nevi) achieved suboptimal performance: sensitivity (70.47%), specificity (79.86%), and accuracy (74.68%). To enhance these outcomes, the follwoing key improvements were introduced for CNN-B model:

1. implementation of image quality control methods;
2. integration of an object detection model to focus on lesion areas;
3. additional training of the CNN model using the preprocessed dataset.

Results: The enhanced model (CNN-B) demonstrated significant improvements, achieving sensitivity of 85.32–86.97% and specificity of 87.59–88.92%. These performance metrics surpass the diagnostic capabilities of non-specialist physicians relying on unaided visual examination, making the model suitable for population-based screening.

Conclusion: The application of artificial intelligence (AI) in medicine necessitates high-performance standards for neural networks models. Training on large volumes of unprocessed images proved insufficient for optimal results. By incorporating data preprocessing steps such as quality control and object detection, significant performance gains were achieved. This improvement underscores the potential of AI as a reliable tool for population-level screening of skin neoplasms.

EADV SYMPOSIUM PRAGUE 22-24 MAY 2025

Abstract N°: 1653

Beyond Thickened Skin: Navigating the Differential Diagnosis of Palmoplantar Keratoderma

Antonia Clivet*[1], Elena Porumb-Andrese[1, 2], Mihaela Paula Toader[1, 2], Daciana Elena Branisteanu[1, 2]

[1]Hospital CFR, Iași, Romania
[2]Universitatea de Medicină și Farmacie „Grigore T. Popa” din Iași, Iași, Romania

Introduction & Objectives

Palmoplantar keratoderma (PPK) encompasses a diverse group of disorders characterized by hyperkeratosis of the palms and soles, ranging from hereditary syndromes to acquired dermatological and systemic conditions. The clinical presentation may vary from diffuse to focal or punctate involvement, often accompanied by additional cutaneous and extracutaneous features. Given the broad spectrum of underlying causes—including genodermatoses, inflammatory diseases, neoplastic conditions, infections, and drug-induced reactions—correctly identifying the subtype of PPK is essential for guiding appropriate management and genetic counseling. This presentation aims to provide a structured approach to the differential diagnosis of PPK, highlighting key clinical patterns, histopathological clues, and diagnostic investigations, supported by illustrative cases.

Materials & Methods

We reviewed the main categories of PPK, focusing on clinical subtypes and their distinguishing features. A classification framework was developed based on inheritance patterns, onset, distribution, associated symptoms, and histopathology. Photographic documentation from real clinical cases was included to illustrate diagnostic challenges.

Results

PPK can be broadly classified into hereditary and acquired forms. Genetic PPKs include syndromic variants (e.g., Papillon-Lefèvre syndrome, Mal de Meleda, Olmsted syndrome) and non-syndromic forms (e.g., striate, diffuse, and punctate PPKs). Acquired causes span a wide range of conditions: inflammatory dermatoses (psoriasis, eczema, lichen planus), infectious etiologies (syphilis, tinea pedis), paraneoplastic syndromes, and medication-induced keratoderma (BRAF inhibitors, lithium, chemotherapeutic agents). Identifying clinical patterns—such as transgradient vs. non-transgradient involvement, symmetry, and associated nail or mucosal findings—provides essential diagnostic clues. In selected cases, histopathology, genetic testing, and systemic workups may be required for confirmation.

Conclusions

The differential diagnosis of PPK is vast and requires a systematic approach to differentiate between genetic and acquired causes. Recognizing specific clinical hallmarks and integrating histological, microbiological, and genetic findings can significantly enhance diagnostic accuracy and optimize management. This presentation aims to provide a practical diagnostic algorithm, emphasizing the importance of pattern recognition and targeted investigations in everyday dermatologic practice.

EADV SYMPOSIUM PRAGUE 22-24 MAY 2025

Abstract N°: 2023

Beyond the Surface: Unraveling the Diagnostic Mysteries of Persistent Glans Penis Lesions in the Elderly

Daciana Elena Brănișteanu[1], Mihaela Paula Toader[1], Elena Porumb-Andrese[1], Andreea-Caterina Rusu[1], Ana Maria Monu[1]

[1]Railway Clinical Hospital Iasi, Dermatovenerology, iasi, Romania

Introduction & Objectives: Chronic inflammatory or premalignant lesions of the glans penis pose a significant diagnostic challenge, particularly in elderly patients with extensive comorbidities. The persistence of an erythematous plaque refractory to conventional therapies requires a meticulous differential diagnosis, encompassing chronic nonspecific balanitis, plasma cell balanitis of Zoon, sexually transmitted diseases (STDs), Queyrat's erythroplasia and atrophic lichen planus**.**

Materials & Methods: We report the case of an elderly male with multiple comorbidities who was referred to our clinic with a persistent erythematous patch on the glans penis, which remained unresponsive to various topical treatments. The lesion raised several differential diagnoses, requiring a systematic approach involving both clinical evaluation and exclusion of infections. This comprehensive diagnostic process was essential for narrowing down the possibilities and reaching the most probable diagnosis.

Results: A 77-year-old uncircumcised male with a medical history of type 2 diabetes mellitus, hypertension and permanent atrial fibrillation presented with a persistent, well-demarcated, non-infiltrated, non-indurated erythematous patch on the glans penis. The lesion, approximately 0.5 cm in diameter, had been present for roughly 3–4 years and was asymptomatic, except for occasional mild burning sensations in the surrounding tissue. Despite multiple attempts with topical treatments,including antiseptics, emollients, medium-potency corticosteroids and antifungals, the lesion showed partial relief but failed to resolve completely. The persistence of the erythematous patch, coupled with its lack of response to standard therapies, prompted further re-evaluation of the differential diagnosis. Among the conditions considered were chronic nonspecific balanitis,plasma cell balanitis of Zoon, Queyrat's erythroplasia, atrophic lichen planus and potential STD-related lesions. Comprehensive microbiological and mycological cultures, along with serological screening for sexually transmitted infections, yielded negative results.

Given the patient's clinical presentation and the absence of classic features of other conditions, the most likely diagnosis was chronic nonspecific balanitis. However, the presence of a persistent erythematous lesion on the glans poses a potential risk of transformation into squamous cell carcinoma. Therefore, careful and continuous monitoring of the lesion is essential to detect any signs of malignancy in a timely manner.

Conclusion: This case highlights the diagnostic challenges associated with persistent erythematous plaques on the glans penis, particularly in elderly patients with significant comorbidities. The interplay between chronic conditions such as diabetes mellitus, which may impair immune response and delay tissue healing, further complicates the clinical picture and contributes to the persistence of these lesions despite conventional treatments. This underscores the importance of a comprehensive, individualized diagnostic and management approach that considers both the patient's medical history and the potential risk of malignancy.

Abstract N°: 2104

Development of an artificial intelligence model to predict the density and distribution of Demodex species in facial erythema patients

Jemin Kim*[1], Yun Na Lee[2], Jihee Boo[1], Jihee Kim[1], Chang Ook Park[3]

[1]Yongin Severance Hospital, Department of Dermatology, Yongin-si, Korea, Rep. of South

[2]Seoul National University Hospital, Seoul, Korea, Rep. of South

[3]Severance Hospital, Department of Dermatology, Seoul, Korea, Rep. of South

Introduction & Objectives:

Accurate identification of *Demodex* mite growth in facial erythema is essential for effective treatment, yet current detection techniques are either semi-invasive or dependent on operator skill. This study aims to develop and evaluate a deep learning model (DemodexNet) that predicts *Demodex* mite density in patients with facial erythema, using clinical data and images and assessing its influence on dermatologists' diagnostic performance.

Materials & Methods:

This diagnostic study involved 1,024 patients with facial erythema who underwent*Demodex* mite density evaluations at two referral hospitals (Severance Hospital and Yongin Severance Hospital) in South Korea between January 2016 and August 2023. DemodexNet was developed using Stacking Ensemble and Globally-aware Multiple Instance Classifier models. The study also included 21 dermatologists (10 residents and 11 board-certified) participating in a two-step reader assessment. Clinical characteristics, serum allergy marker levels, *Demodex* mite density, and DemodexNet predictions were analyzed. Model efficiency was measured using the area under the receiver operating characteristic curve (ROC-AUC), and the dermatologists' performance was compared before and after the implementation of AI support.

Results:

DemodexNet attained ROC-AUC scores ranging from 0.823 to 0.865 in internal testing, with reduced scores in the external testing set. The diagnostic accuracy for dermatologists significantly increased from 63.7% (95% confidence interval [CI], 61.5%–65.6%) to 70.6% (95% CI, 68.7%–72.5%; P<.001) when assisted by AI. Less seasoned dermatologists and those with greater trust in AI showed the most substantial performance improvements. The model identified central facial areas and specific lesions typical of demodicosis. Age (OR, 1.25; 95% CI, 1.12–1.38) and positive patch test outcomes (OR, 1.43; 95% CI, 1.01–2.04) correlated positively with *Demodex* mite density, while extra-facial skin involvement was negatively correlated (OR, 0.20; 95% CI, 0.13–0.31).

Conclusion:

DemodexNet shows promising results in predicting *Demodex* mite density and significantly enhances dermatologists' diagnostic accuracy. This non-invasive method could improve the diagnosis and treatment of *Demodex*-related facial erythema, especially for less experienced clinicians. Additional validation of DemodexNet across diverse populations is essential to verify its generalizability.

Abstract N°: 2170

Ultrasound-guided biopsy improves the diagnostic accuracy of cutaneous vasculitic and vasculopathic conditions

Kurosh Parsi[1], Manisha Siriwardene[1]

[1]St Vincent's Hospital Sydney, Dermatology, Darlinghurst, Australia

Title: Ultrasound-guided biopsy improves the diagnostic accuracy of cutaneous vasculitic and vasculopathic conditions

Introduction & Objectives:

Tissue biopsy of reticulate eruptions and cutaneous vascular conditions where the precise location of the affected vessels is unknown pose a challenge to most dermatologists. A commonly asked challenge is whether to biopsy the centre of the reticulate eruption or the rim to improve the diagnostic accuracy. Ultrasound technology has gained enough sensitivity and resolution to visualise dermal and subdermal microvasculature. Here, we report 6 cases where the use of ultrasound-guided biopsy increased the diagnostic accuracy of conditions such as lymphocytic thrombophilic arteritis (LTA) and livedo vasculopathy (LV).

Materials & Methods:

Six patients with reticulate eruptions affecting the lower limbs were referred for a second dermatologic opinion and management. All patients had previously undergone punch biopsies which were non-diagnostic. Ultrasound assessment was performed using Aplio i800 (Canon), with a 33 MHz Ultra-High Frequency iDMS Linear (i33LX9) transducer. In five patients with suspected LTA, the affected central arterioles were identified on ultrasound at the centre of the livedo racemosa eruption. The affected arterioles demonstrated perivascular echogenic halo, indicative of vessel inflammation on B-mode and diminished blood flow on *Superb Micro-vascular Imaging* (SMI). In one patient with suspected LV, non-compressible, thrombosed venules were detected directly under the site of reticulate pigmentation. Punch or incisional biopsies were performed to capture the affected vessels identified on ultrasound.

Results:

In all six cases the target vessels were captured on histology. Five patients were diagnosed with LTA and one with LV.

Conclusion:

Ultrasound-guided biopsy is an extremely useful adjunct in guiding site selection for skin biopsies. This technique helps to increase diagnostic sensitivity, especially in vascular conditions such as LTA or LV.

Abstract N°: 2302

Evaluation of noninvasive imaging techniques for basal cell carcinoma subtyping: a systematic review

Mehdi Boostani[1], Giovanni Pellacani[2], Ximena Wortsman[3], Carmen Cantisani[2], András Bánvölgyi[1], Kende Kálmán Lőrincz[1], Norbert Wikonkal[1], Péter Holló[1], Pawel Pietkiewicz[4], Mohamad Goldust[5], Wendy Huss[6], Kamran Avanaki[7], Gyorgy Paragh[6], Norbert Kiss*[1]

[1]Semmelweis University, Budapest, Hungary
[2]Sapienza Università di Roma, Rome, Italy
[3]Skin and Soft Tissues -University of Chile, Santiago, Chile
[4]Poznań, Poznań, Poland
[5]Yale, New Haven, United States
[6]Roswell Park Comprehensive Cancer Center, Buffalo, NY, United States
[7]University of Illinois Chicago, Chicago, United States

Introduction & Objectives: Basal cell carcinoma (BCC) is the most common form of skin cancer, with distinct histological subtypes, including nodular (nBCC), superficial (sBCC), and infiltrative (iBCC). Accurate subtyping is essential for selecting optimal treatment strategies. While histopathological biopsy remains the gold standard for diagnosis, noninvasive imaging techniques offer a promising alternative. This study systematically evaluates the diagnostic performance of FDA- and EMA-approved noninvasive imaging modalities for BCC subtyping.

Materials & Methods: A systematic literature search was conducted using EMBASE, Scopus, PubMed, and the Cochrane Library to identify relevant studies published up to November 30, 2024. Included studies assessed the diagnostic accuracy, sensitivity, specificity, and agreement with histopathology of dermoscopy, conventional high-frequency ultrasound (HFUS), dermoscopy-guided high-frequency ultrasound (DG-HFUS), optical coherence tomography (OCT), high-definition optical coherence tomography (HD-OCT), dynamic optical coherence tomography (D-OCT), line-field confocal optical coherence tomography (LC-OCT), and reflectance confocal microscopy (RCM). Data were extracted from 19 studies involving 2,650 BCC lesions.

Results: Dermoscopy exhibited moderate diagnostic accuracy, with one study reporting 81.9% sensitivity and 81.8% specificity for sBCC. Conventional HFUS demonstrated strong predictive value for sBCC, while DG-HFUS achieved superior accuracy, with 82.4% sensitivity and 91.3% specificity for subtype risk stratification. LC-OCT displayed the highest diagnostic performance, with 100% sensitivity for iBCC and excellent agreement with histopathology. D-OCT allowed subtype differentiation at 150 µm depth, revealing dot-like structures in 63% of iBCC cases. The presence of serpiginous vessels reduced sBCC risk by 78% (RR = 0.22, P = .001), whereas branching vessels at 300 µm increased nBCC risk by 53% (RR = 1.53, P = .016). HD-OCT exhibited 100% sensitivity for sBCC with 97.9% overall accuracy but showed lower accuracy for non-sBCC subtypes. RCM achieved 88.9% sensitivity for non-sBCC subtypes but was less effective in detecting aggressive variants (33.3% sensitivity). Ultrasound had the highest tissue penetration, aiding in the detection of cartilage, muscle, and bone involvement.

Conclusion: LC-OCT and HD-OCT demonstrated superior accuracy for BCC subtyping, while DG-HFUS outperformed dermoscopy and HFUS individually. The findings highlight the potential of advanced noninvasive imaging modalities in improving diagnostic precision and guiding clinical management.