

Looking at the Skin in the Digital Age

ENTRETIENS D'AVÈNE, AVÈNE, FRANCE ON JULY 9, 2016



Speakers, from left to right: Giuseppe Argenziano – Luc Thomas – Josep Malvehy – Susana Puig – David Moreno-Ramirez – Ana Beatris Rossi – Antoine Bohuon – Eric Tkaczyk – Giovanni Pellacani.

CHAIRMAN'S INTRODUCTION

In this issue dedicated to digital imaging systems our aim was to describe recent developments and actual possibilities offered by the new technologies in the field of management of skin diseases. In 2005, June Robinson, the editor of *JAMA Dermatology* wrote "... We are beginning to move away from clinico-pathologic diagnosis into an era of clinico-imaging diagnosis...". Today, more than 10 years later, this vision has become true.

In the article by Eric Tkaczyk titled "**Innovations and developments in dermatologic non-invasive optical imaging and potential clinical applications**" the author summarizes the large spectrum of optical techniques that could be applied to clinical dermatology. Most dermatologists are aware of the benefits of dermoscopy, and a few are familiar with laser-scanning confocal imaging. Beyond those, there are 11 different categories of optical techniques that have been applied to clinical dermatology. Four are the less known innovations that are already available or still in development (laser Doppler and speckle imaging, Raman spectroscopy, multiphoton microscopy, photoacoustic tomography). They have the potential to be applied in different field of clinical dermatology, including

blood flow monitoring, skin cancer diagnosis, composition measurements in atopic dermatitis, skin rejuvenation measurement, and noninvasive sentinel lymph node assessment in melanoma. These methods present many advantages, being non-invasive, portable, and rapid. The development of optics in biological and biomedical sciences (i.e. biophotonics) requires not only deep insight into the applications but also synergistic collaboration between engineers and clinicians.

In the article titled "**Dermoscopy, digital dermoscopy and other diagnostic tools in the early detection of melanoma and follow-up of high-risk skin cancer patients**", Luc Thomas and Susana Puig go deep into the issue of early detection, which is a key strategy for reducing the mortality and economic burden associated with melanoma. Dermoscopy is a non-invasive and cost-effective tool for melanoma diagnosis, which has been shown to be a reliable and sensitive method for detecting early-stage skin cancer and reducing the number of unnecessary excision of benign lesions. Patients at high risk of developing melanoma require long-term surveillance and the use of digital dermoscopy follow-up of these patients has led to improved outcomes. Combined follow-up programs

using total body photography and digital dermoscopy have led to further improvements in early diagnosis and diagnostic accuracy. Dermoscopy is now widely used by dermatologists but the public health impact of this tool is yet to be evaluated. Despite the clear advantages of dermoscopy and digital follow-up methods, dermoscopy training and access to digital dermoscopy among dermatologists and general practitioners needs to be improved.

“Dermoscopy, confocal microscopy and other non-invasive tools for the diagnosis of non-melanoma skin cancers and other skin conditions”, by Josep Malvehy and Giovanni Pellacani, is an article focusing on non-melanoma skin cancer including basal cell and squamous cell carcinomas. These are the most common skin neoplasms and their incidence is steadily increasing worldwide. The cure rate is high with early detection and appropriate treatment. Visual examination is the first screening tool used by clinicians but it is sometimes not sufficient to discriminate benign from malignant lesions. Skin biopsy with histopathology remains the gold standard for differential diagnosis. However, this procedure is invasive and occasionally painful. Repeated tissue sampling is not conceivable in patients with several suspicious lesions and various clinical presentations challenging to identify. Several medical imaging tools are available for non-invasive in-depth skin examination to guide clinical diagnosis, including dermoscopy, confocal microscopy, cross-polarized light and fluorescence photography, optical coherence tomography and high frequency ultrasound, which are discussed along with their clinical applications. Those techniques provide valuable

clinical information for better detection, confident diagnosis and optimal treatment of non-melanoma cancers.

In the last article by David Moreno-Ramirez and Giuseppe Argenziano, **tele dermatology and mobile applications in the management of patients with skin lesions** are reviewed. Tele dermatology and smartphone mobile applications have been at the forefront of advances in the screening and management of patients with skin lesions over the past decade. The Spanish tele dermatology network, established in 2004 in the area surrounding the dermatology clinic in Seville, has now managed over 50,000 teleconsultations and has led to validated improvements in waiting times for referral and surgery, allowed patients to be treated in local settings, and improved the early diagnosis and initial prognosis of patients diagnosed with melanoma. Both tele dermatology and smartphone mobile applications can be used as training tools to improve the diagnostic skills of physicians and dermatologists. They can also serve as rapid and reliable methods to prioritize patient care and ensure specialized services and treatments are accessible regardless of patient circumstances.

In summary, there are many new technologies steadily available for the physician to improve his/her ability to diagnose and manage a large spectrum of skin disorders including skin neoplasms and inflammatory/infectious conditions. Some of the new technologies are already part of the daily routine of thousands of physicians worldwide, while other techniques will probably become available in the very near future. The era of clinico-imaging diagnosis just started and, like it or not, there is no way to go back!

Giuseppe ARGENZIANO, MD

Dermatology Unit, University of Campania, Via Pansini 5, IT-80131 Naples, Italy. E-mail: g.argenziano@gmail.com

Publication of this supplement was funded by Laboratoires Dermatologiques Avène.