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WEDNESDAY, 12 JUNE 2019

14:15:00 – 15:45:00

Crystal I

SP0023 INTRODUCTORY TALK ON CRYSTAL ANALYSIS

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Rheumatologists are used to do the arthrocentesis to diagnose (and treat) patients with joint effusions. Crystal arthropathies are the most common inflammatory joint diseases. So the prompt detection of (micro-) crystals in joint fluid by microscopic analysis is of outstanding importance to make the right diagnosis of the very common disease gout or CPPD-arthritis (1). Since many years the EULAR facilitates practical courses in microscopy of crystals to start the training of rheumatologists in that helpful technique. During the practical skill course the trainee will be shown how to properly prepare a slide of SF, analyze the preparation with ordinary light, simple and compensated microscope and learn to discriminate urate from CPPD-crystals^{2,3}.

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WEDNESDAY, 12 JUNE 2019

14:15:00 – 15:45:00

Capillaroscopy I

SP0024 STANDARDISATION OF NORMAL VERSUS ABNORMAL AND PATHOLOGICAL CAPILLAROSCOPIC IMAGES

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Abstract: Medical doctors frequently get patients with Raynaud's phenomenon (RP), a frequent symptom in the general population, referred. The importance of distinguishing normal capillaroscopic findings from (pathognomonic) abnormal (pathological) findings (scleroderma pattern), lies in the fact that this distinction allows the differentiation between a primary RP (not connected to any connective tissue disease [CTD]) from a secondary RP due to systemic sclerosis (SSc) and diseases of the scleroderma spectrum.

What is normal in primary RP?

A normal capillaroscopic pattern, by qualitative assessment, is characterized by a homogeneous distribution of hairpin shaped capillaries as a "comb-like structure", with a density of >7capillaries per mm, with a normal dimension and absence of large hemorrhages. Yet, there exists a wide intra- and inter-individual variety in a normal population which will be discussed in this session.

What is pathognomonic abnormal in patients with RP due to SSc?

Patients with the RP who have an underlying clinically recognizable (= with skin involvement) SSc show a very characteristic combination of capillary abnormalities in the nailfold, which can easily be assessed through qualitative assessment (= pattern recognition). Maricq et al. described last century, with the widefield technique (magnification X12–14) the scleroderma pattern. This pathognomonic combination contains the following: a striking widening of all three segments of the

capillary loop (arterial, venous and intermediate), loss of capillaries and disorganization of the nailfold capillary bed. Many branched "bushy" capillaries may also be observed.

In 2000, Cutolo et al. qualitatively assessed the nailfolds of an SSc cohort with patients fulfilling the American College of Rheumatology (ACR) criteria for SSc with the nailfold videocapillaroscopic (NVC) technique (magnification X200). According to the different proportions of the hallmark parameters of the scleroderma pattern (giants, capillary loss, hemorrhages and abnormal shapes: (neo) angiogenesis, Cutolo et al. defined three patterns "early", "active" and "late".

The central role of capillaroscopy in distinction between a primary and secondary RP due to SSc is reflected by the fact that capillaroscopy is one of the new ACR/EULAR criteria for classifying a patient as having SSc.

In this lecture the standard "FAST TRACK" recognition system of the EULAR Study Group on Microcirculation in Rheumatic Diseases to discern scleroderma patterns from non-scleroderma patterns will be taught to the attendees.

Suggested further reading:

- Smith V, et al. *Rheumatology* (Oxford). 2016;55(5):883-90.
 Cutolo M, et al. *Rheumatology* (Oxford). 2018;57(4):757-759.
 Cutolo M, et al. *Autoimmun Rev*. 2018;17(4):344-352.

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SP0025 RELIABILITY IN THE LAST 10 YEARS: CAPILLAROSCOPIC CHARACTERISTICS VERSUS INSTRUMENTAL DETECTION

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Background: With nailfold capillaroscopy there are different aspects of reliability to consider, including reliability of qualitative image grading (e.g. 'early', 'active' and 'late') and also of semi-quantitative and quantitative measures including capillary density, apical width and presence of giant capillaries. The reliability of image acquisition (i.e. test-retest reliability) is especially important if nailfold capillaroscopic parameters are to be used in longitudinal studies (e.g. clinical trials) which involve acquiring repeat images over time. Lastly when assessing reliability, it is important to recognise that the nailfold capillaries cannot always be clearly seen, and cannot therefore be evaluated.

Objectives: To highlight the different aspects of reliability relating to nailfold capillaroscopy and how these have been addressed in studies over the last 10 years.

Methods: Review of recent studies

Results: 1. Intra-observer reliability has been shown in several studies to be higher than inter-observer.

2. Assessment of 'evaluability' varies between observers and therefore also needs to be taken into account when assessing reliability.

3. Subject to evaluability, certain parameters demonstrate high intra- and inter-observer reliabilities. Reliability differs across different capillaroscopic parameters.

Conclusion: Recent studies examining reliability of capillaroscopy suggest that certain parameters, including image grade, capillary density and apex width have high intra- and inter-observer reliabilities (subject to nailfold image evaluability, which remains a major challenge). Standardised training is likely to improve reliability.

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- [2] Overbury R, Murtaugh MA, Fisher A, et al. Primary care assessment of capillary abnormalities in patients with Raynaud's phenomenon. *Clin Rheumatol* 2015; 34: 2135-40.
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- [4] Dinsdale G, Moore T, O'Leary N, et al. Intra- and inter-observer reliability of nailfold videocapillaroscopy - A possible outcome measure for systemic sclerosis-related microangiopathy. *Microvascular Research* 2017; 112: 1-6.
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- [6] Boulon C, Devos S, Mangin M, et al. Reproducibility of capillaroscopic classifications of systemic sclerosis: results from the SCLEROCAP study. *Rheumatology* 2017; 56: 1713-20.
- [7] Cutolo M, Melsens K, Herrick AL, et al. Reliability of simple capillaroscopic definitions in describing capillary morphology in rheumatic diseases. *Rheumatology* (Letter) 2018; 57: 757-9.

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SP0026 METHODS AND TOOLS FOR QUANTIZATION OF CAPILLAROSCOPIC MORPHOLOGICAL CHANGES

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Capillaroscopy is routinely used in clinical practice to assess nailfold microvascular structure. Unlike laser techniques that give functional information, capillaroscopy allows a morphological assessment of nailfold capillary bed. It is a recognized tool to early differentiate primary from secondary Raynaud's phenomenon, as well as to follow scleroderma microangiopathy. As microangiopathy extent correlates with organ involvement degree, nailfold capillaroscopy abnormalities are also considered a possible biomarker in systemic sclerosis.^{1,2} Several tools may be used to quantitate morphological capillary changes, from devices with low magnification (20x), to instruments with high magnification (200x or more).³ The instruments with low magnification allow a global evaluation of the entire nailfold area (wide-field capillaroscopy), and they provide a panoramic vision of the whole nailfold microvascular network. Magnifying glass, ophthalmoscope and dermatoscope are example of optical instruments with low magnification. Obtaining a high-quality documentation may be difficult by these tools, as well as the identification of early capillary changes; furthermore, storing capillary images is not possible.

Stereomicroscope, usb-microscope or videocapillaroscope allow a sequential higher magnification up to 600x which enable detailed observation of small nailfold areas or single capillaries. However, by using a microscope, patient's fingers must be placed under the lens, and this may make the exam sometimes difficult, for example in the presence of either finger contractures or arm disabilities.

The optical probe videocapillaroscope is currently considered the gold-standard for nailfold videocapillaroscopy, as it has the advantage to be moved to the finger of the patient at direct contact with the nailfold: this facilitates examination of patients with systemic sclerosis and finger flexion contractures, simply by moving the probe. The use of videocapillaroscope has a high sensitivity, a short time of execution after an easy operator training, allows early diagnosis of secondary Raynaud's phenomenon by very early detection of microvascular changes, and also allows the counting and scoring of capillaroscopic parameters. Connection of the instrument with a software enable image recording, report writing and automated capillary number counting.⁴

To quantitate capillaroscopic morphological changes (mainly capillary number, capillary dilations, giant capillaries, microhemorrhages, abnormal shape/ramified capillaries, capillary bed disorganization) a simple rating scale may be adopted to score each capillary abnormalities (score 0-3) (score 0 = no changes; score 1 = less than 33% of capillary alterations/reduction; score 2 = 33-66% of capillary alterations/reduction; score 3 = more than 67% of capillary alterations/reduction, per linear millimetre. Reduction = capillary number per linear millimetre <9).⁵ The mean score value for each capillaroscopic parameter is calculated from the analysis of at least two millimetres in the centre of the nailfold, by evaluating the first row of capillaries in each finger from 2nd to 5th.

The Microangiopathy Evolution Score (MES) (sum of scores of progression parameters: capillary number, abnormal shaped/ramified capillaries, capillary bed disorganization - Score 0-9) may be calculated to follow the scleroderma microvascular damage.⁵ However, at least the simple capillary number per linear millimetre should be counted, as well as larger capillary diameters measured, to monitor microangiopathy in systemic sclerosis.^{4,6,7}

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WEDNESDAY, 12 JUNE 2019

16:15:00 – 17:45:00

Bringing digital health care solutions to patients_____

SP0027 E-HEALTH REDEFINES THE RELATIONSHIP BETWEEN PATIENTS WITH RMDs AND HEALTH CARE PROFESSIONALS

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By definition of the World Health Organization (WHO), e-health relates to the use of information and communication technologies for health services. This incorporates digital patient charts, access to their respective health records by the patient and treating physicians as well as medical apps (applications) for monitoring of health parameters and interacting with health care professionals and peers. The use and initiatives and legislations concerning e-health have become increasingly wide spread across the world. With the continued popularity of smartphones in recent years, both smartphone applications and social media are progressively used. In 2018, worldwide users of social media were estimated at 3.196 billion, accounting for 42% of the global population. Social media use has grown enormously in the last decade, with a plus of 13% in 2017 alone. More than half and two thirds of the world's population are connected to the internet and having a mobile phone respectively. The roll-out of mobile solutions, affordable smartphones and broadband internet in remote areas on the globe allow for quicker and more specialised medical encounters. These developments enable people also to conveniently interact, access knowledge and take part in continued medical education regardless of geographical location. Mobile health (m-health) services range from toll free emergency numbers or health call centres (available in 75% of WHO countries) to treatment adherence and surveillance programs (48% of WHO countries). Fields, like radiology apply telehealth already very successfully, which leads to greater health equity globally. Therefore, e-health provides people with health conditions, particularly chronic conditions such as rheumatic and musculoskeletal diseases (RMDs), with new opportunities to identify information about their disease and treatment, as well as the ability to connect.

The use of e-health solutions for collecting patient reported outcomes (PRO) enables patients to more realistically depict on how they are doing over time, provides better comparisons and changes the dynamic of feedback and the potential most appropriate time point for clinical encounters. Online health users with rheumatoid arthritis do currently however not represent the general population of people with RA, since there are more often younger, do have shorter disease duration and live in rural areas. At the same time, they define an additional group for clinical trials and have a high willingness to participate, which outlines new avenues for recruitment of patients into trials. Still, continued constant use of m-health applications is less common. One third of people that started using a mobile health app are using it on daily or weekly basis. The use of apps does not always coincide with better outcomes as could be shown in a trial incorporating people with poorly controlled hypertension. This indicates, despite all positive developments and opportunities over the last decade, that there is still a long way ahead to tailor e-health initiatives to result in more optimised work flows for health care professionals and better health management for everyone.

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SP0028 WHAT SHOULD MOBILE HEALTH APPLICATIONS FOR RMD PATIENTS BE LIKE?

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Mobile health (mhealth) connects patients, their families and physicians by creating a network with mobile and specialized devices such as wearable sensors, recording health parameters and gathering health data converted and transferred to physicians via medical application interfaces. Apps for people with chronic health conditions have an important role to play in empowering those individuals to become more active in the self- and shared-management of their health. Since rheumatic and musculoskeletal diseases (RMDs) have multi-dimensional consequences on health, the increasing availability of apps have an important role to play in enabling people with RMDs to better self-manage their health. This talk provides insights into the most important aspects to be considered for apps designed for people living with RMDs: features, use, safety, and patient's views and preferences.

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