

Capillaroscopy

The What
The Why
The When
The Who
& the How

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- Nailfold capillaries were first observed in the 17th century with primitive magnifying equipment
- In the early 19th century the first associations between inflammation and capillary alterations observed.
- **Maurice Raynaud's**, research in the late 19th and first decades of the 20th century established a direct link between capillary abnormalities and certain medical conditions.
- In the 1930s, interest in capillaroscopy began to wane, to rise again in the 1980s and 1990s.

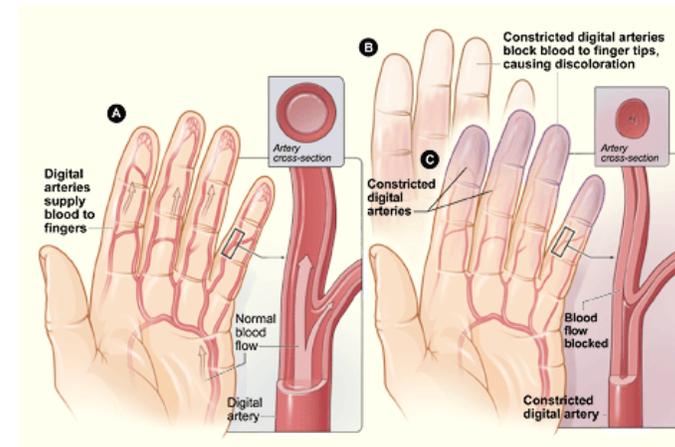
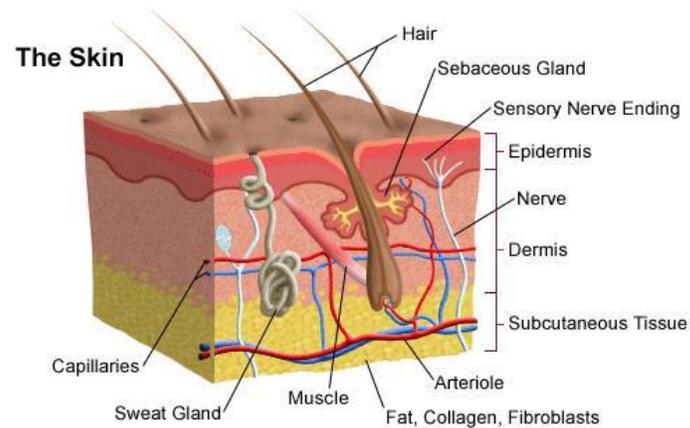
- At the beginning of the 21st century, there has been a renaissance of the capillaroscopic technique and widespread recognition of its significance.

What is capillaroscopy

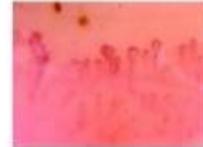
- Nailfold capillaroscopy is a non-invasive imaging modality for the visual analysis of the capillaries in the nailfold area.
- In rheumatology, it is a method of choice for differential diagnosis between primary and secondary Raynaud's phenomenon (RP) in systemic rheumatic diseases.
- RP is a common diagnostic problem in rheumatology.

- In vivo, non-invasive, and inexpensive imaging technique (relatively) and allows the direct observation of the capillary network in living tissue.
- Microcirculation in capillaries is routinely evaluated within the skin of the nailfold.
- The entire skin is filled with capillaries; however, they run perpendicular to the skin surface, and only the tip of the loop is visible.

- In the nailfold, terminal rows of capillaries run parallel to the skin surface and, therefore, all morphological details and the nature of the blood flow can be examined



Nailfold capillaroscopy



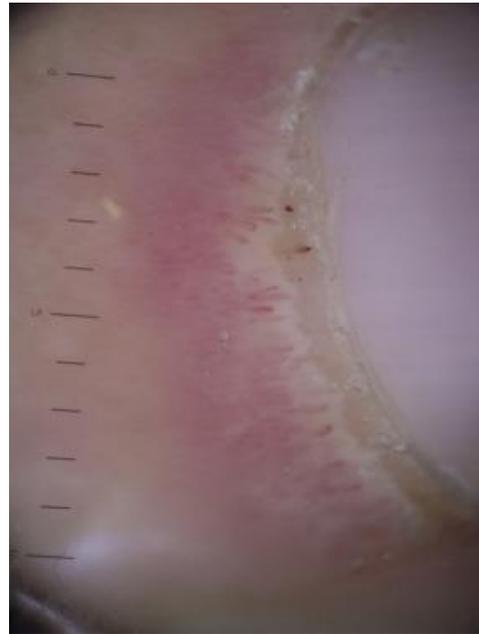
Early pattern



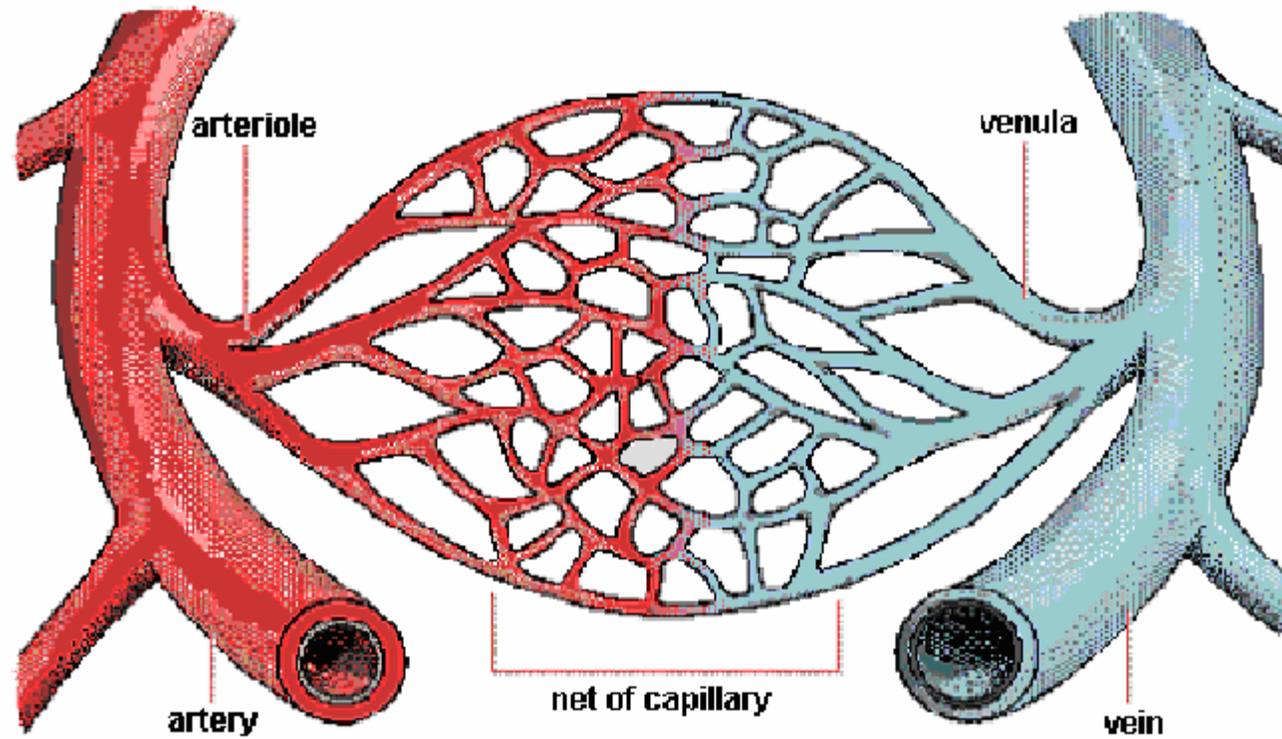
Active pattern



Late pattern



The microcirculation



- The vessels on the arterial side of the microcirculation are called the arterioles
 - innervated,
 - are surrounded by smooth muscle cells
 - 10-100 μm in diameter.
- Arterioles carry the blood to the capillaries
 - not innervated,
 - have no smooth muscle,
 - and are about 5-8 μm in diameter.
- Blood flows out of the capillaries into the venules,
 - which have little smooth muscle
 - and are 10-200 μm .
- The blood flows from the venules into the **veins**.

- Microcirculation has three major components:
 - pre-capillary,
 - capillary
 - and post-capillary.

Why

- The early detection of microvascular changes that can occur in some inflammatory connective tissue diseases is the main advantage
- Patients with Raynauds Phenomenon are evaluated early at presentation to assess for a possible CTD

- Capillaroscopy has been included in the new 2013 classification criteria for systemic sclerosis and is considered a key investigation in the very early phases of the disease.
- Because of its potential value in monitoring disease progression and treatment response, nailfold capillaroscopy may also have a role in the management of overt systemic sclerosis.

- Scleroderma spectrum
- Systemic sclerosis
- Mixed Connective Tissue Disease
- Dermato/Polymyositis
- Juvenile CTD
- Psoriasis, PsA, Sjogrens and RA ongoing research

Who ?

Indications for capillaroscopy

Differential diagnosis of primary and secondary Raynaud's phenomenon

Staging of systemic sclerosis

Predicting formation of new digital ulcers in systemic sclerosis (CSURI)

Response assessment of dermatomyositis treatment

Differential diagnosis of dermatomyositis and Polymyositis,

Screening for interstitial lung disease in MCTD, ScM and PBC

Differential diagnosis of interstitial lung disease

How

- Ophthalmoscope
- Dermatoscope
- Photomacrography system
- Stereomicroscope
- Conventional Optical Microscope
- Videocapillaroscope





USB digital microscope



Cost:

- CapillaryScope 500: R5989
- CapillaryScope 200 Pro: R9577
- CapillaryScope 500 Pro: R9577



[CAPILLARYSCOPE 500 PRO](#)

- 1.3 Megapixel resolution
- For inspection of capillary vessels
- Around 500x magnification & Built-in polarizer
 - Medical Device Class 1



[CAPILLARYSCOPE 200 PRO](#)

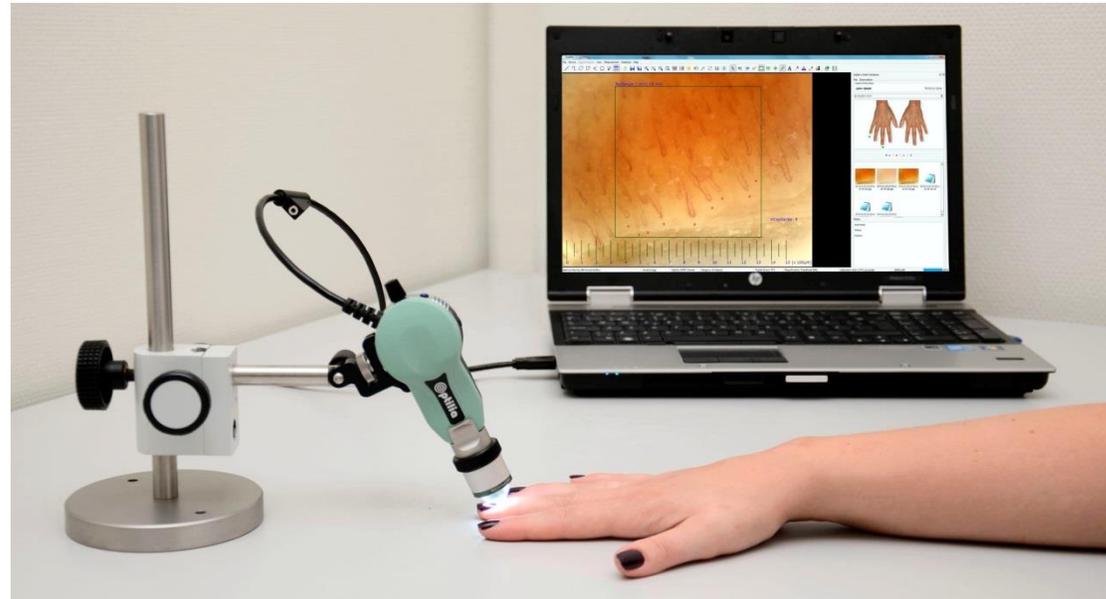
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 - Medical Device Class 1



[CAPILLARYSCOPE 500](#)

- 1.3 Megapixel resolution
- For inspection of capillary vessels
 - 500x Magnification
- Medical Device Class 1

Gold Standard



- VideoCapillaroscope: cost.....
- Gold standard for research purposes
- most videocaps have been evaluated for reliability
- \$\$\$\$

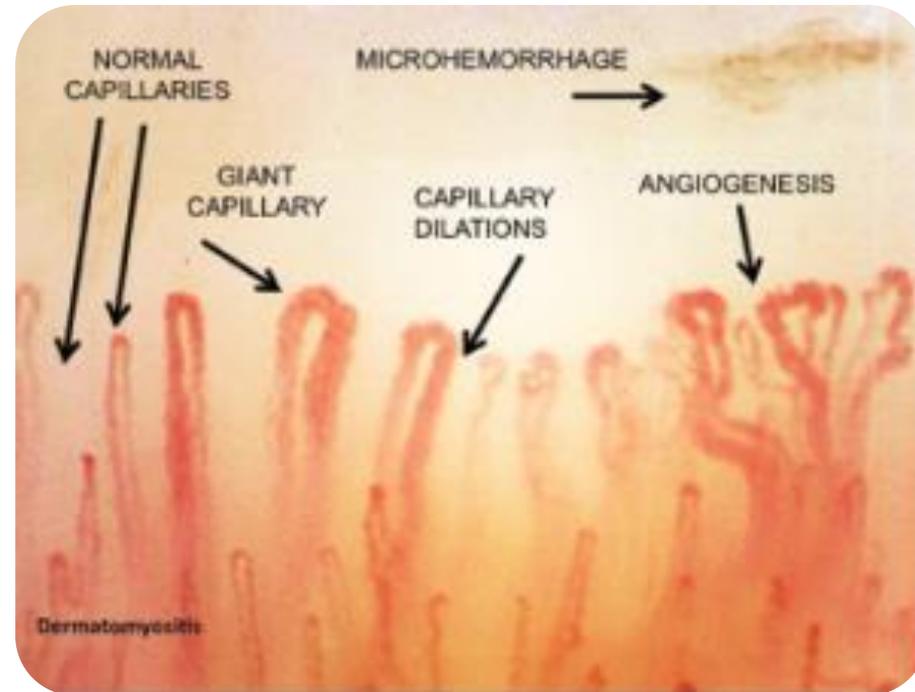
- A digital videocapillaroscope combines a microscope with a digital video camera
- It has a low magnification capability but can also take advantage of its sequential high magnification function to distinguish the capillaries based on observable details.
- Furthermore, it allows a direct contact with a nailfold
- also enables the examination of patients with severe finger flexion contractures.

Procedure.....

- Remove all nail varnish, avoid cutting of cuticle at least 4 weeks prior
- Washing the Hands or Toes
- Avoid smoking, drinking coffee and tea before the procedure
- In order to acclimatize the patients and get them relaxed before the test, they should be seated at room temperature (20–25°C) for 15–20 minutes.
- Then, depending on the outside temperature, a patient's hands would be positioned at her heart level.
- In order to improve the image resolution, a drop of vegetable oil is placed on the nailfold of each finger or toe before observation

- A videocapillaroscope directly contacts a patient's nailfold.
- Neutral skin friendly oils are used (walnut, cedar, olive and peanut oil)
- Use the 4th and 5th fingers (most transparent)
- In order to minimize the reflections, the contact angle and direction of the videocapillaroscope may be changed.
- A sharp image of capillary branches can be acquired by manually adjusting the focusing system and using the camera head.

- Avoid pressure, it can modify the vessels!
- Four consecutive images (1 × 1 mm in size) are usually taken from the middle of a nailfold by a videocapillaroscope at a magnification of 200x .
- Research: 4 images per finger (excl thumbs)
- *Capillary Patterns Study.*
- After evaluating the patients with different microvascular abnormalities, an experienced observer compares and discusses the stored images of capillary patterns





KEEP
CALM
AND
PERFORM A
Capillaroscopy