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ORIGINAL ARTICLE

Does the use of nail cosmetics interfere with the reporting of nailfold capillaroscopy?

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Abstract

Capillaroscopy is a non-invasive tool evaluating the nail-fold capillaries, especially in approach to Raynaud's phenomenon (RP) and scleroderma (SSc) spectrum of diseases. It was recommended that the patients should not use any cosmetic procedure involving the nailfold to avoid misinterpretations. Therefore, we aimed to find the problems of using or recent removal of the nail polishes/artificial nails/henna before doing capillaroscopy. During 10 years, we looked for all capillaroscopy reports and nail fold images of patients who referred for capillaroscopy and had used or recently removed nail polish/artificial nail/henna in order to find the presence of any artifacts or misinterpretations in reports. Sixty-three patients were identified that had used or removed the nail cosmetic during 10 days before capillaroscopy. In patients who used nail polish, removed their nail polish, used artificial nails, or removed the artificial nails, and those using henna, 16.2%, 36.4%, 3.8%, 0%, and 1.4% of nail folds showed some stains in the upper part of the nail fold area, respectively, that had no interference with the report due to their distinct color. However, few areas were covered with polish stains in patients who removed the polish recently. The presence of nail cosmetics including nail polishes, henna, and artificial nails at the time of capillaroscopy does not induce a significant misinterpretation in capillaroscopy. However, some colored stains which were mostly distinguishable from hemorrhages could be seen. The removal of them 10 days before the time of capillaroscopy did not decrease the cosmetic artifacts.

Key Points

- *The presence of nail cosmetics including nail polishes, henna, and artificial nails at the time of capillaroscopy does not induce a significant misinterpretation in capillaroscopy.*
- *The removal of nail polish 10 days before the time of capillaroscopy did not decrease the procedure artifacts.*
- *The removal of nail polish 10 days before capillaroscopy increased the area of artifacts and coverage of the study background.*

Keywords Artificial nail · Capillaroscopy · Henna · Nailfold · Nail polish

Introduction

Capillaroscopy is a non-invasive tool used for evaluation of nail-fold capillaries and differentiation of the primary and secondary Raynaud's phenomenon (RP) due to scleroderma (SSc) spectrum of diseases, was included in the 2013 ACR/EULAR classification criteria for scleroderma; it also helps for better diagnosis of inflammatory myopathy spectrum of diseases especially patients with dermatomyositis (DM). Moreover, it is as an easily used tool for following the patients with systemic connective tissue diseases (CTD) during their treatment in research trials. It has also been implicated in some non-rheumatic diseases that endothelial dysfunction plays a role in their pathogenesis for microvascular complications like diabetes mellitus, pulmonary disease (ILD and PAH), and dermatologic diseases [1–5]. The nailfold capillary patterns can change in patients with SSc and DM with combined therapy associated with improvement of clinical outcomes [6, 7]. In addition, it is mandatory in the rheumatology fellowship curriculum of many countries. As it is very operator-dependent, methodological standardization for everyday practice and clinical research has been done, and the last standardization using a Delphi process in 2020 by international participants developed a

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study. Many of them were referred from remote cities, and by other university rheumatology colleagues to diagnose their disease and recommend the capillaroscopy before starting their treatment.

After reviewing the images and reports of these patients, we found some color staining due to the presence of nail polish in 16.2% of patients, some of which resembled the microhemorrhages due to the color of the nail polish and some of which were shiny small materials due to added materials of nail polishes. Although all of the stains could be defined from microhemorrhages and had rarely covered the study area, most of them were in the upper portion of the study area. Henna did not disturb the reports as its rare stains had a distinct color, only made the background yellowish, and had no effect on the report. When the patients tried to remove the nail polish from their nails during 10 days before the study time, based on the recommendation of their referral physician or their concept, the risk of the presence of the remaining stains was increased to 36.4%, and the stains were more distributed in the field of study that covered the area in few nail folds (6.2%) as can be seen in the images. The presence of artificial nail could also induce some (3.8%) stains above the study area. Removal of the artificial nails were only seen in 2 patients that is a low number for the study; however, it did not induce stain or microhemorrhages.

In previous studies, it has been mentioned that the traumatic nail is better not be studied; when starting a capillaroscopy, the operator should look for any cutaneous lesions and any possible mechanical and external causes for abnormalities and especially ask if there had been any procedures of manicure, onychophagy, and any cosmetic procedure involving the nailfold area in the previous 3 weeks since the consequent micro-traumas and wounds can give false-positive results in the interpretation of hemorrhage and/or neoangiogenesis [10, 11]. Also, it is recommended that the patients should be asked to remove nail polish, artificial nail, or gel prior to the procedure and avoid manicures, based on the international Delphi consensus; however, the exact time of removal or prohibition has not been suggested [8]. The maximum time of the removal of nail polish in our study was 7 days that seems not to be effective for decreasing the stain artifacts; it may increase these artifacts due to the removal of the polish and might distribute the stain more than before.

Based on this study and our experience, especially in the era of COVID-19, the referral of patients again for doing capillaroscopy in patients with suspected stain on their nail folds is not easy for them. If the procedure is done by an expert rheumatologist or under observation of that rheumatologist in teaching centers, it is better not to ask the patients to remove the nail polish/artificial nails/henna as it may increase the stains and not reject them for doing this procedure at the time of presence of nail polish (it does not include the manicure or traumatic procedures). In cases with doubtful results, especially in differentiation between the microhemorrhages and red color stain that seems to be very rare, those nail folds could be reevaluated after removal of the nail polish after at least 2–3 weeks. This can be considered as an area of more investigation in future research. We had one patient in the follow-up that did not continue her participation in this study after 3 weeks of nail polish removal, and there was no sign of remained nail polish; therefore, it is probably a good time for follow-up capillaroscopy after removal of the nail polish. The limitation of our study was limited days of removal of polishes before capillaroscopy and the participants' lack of referral for follow-up to see the exact time of disappearance if there were stains.

Conclusion

The presence of nail cosmetics including nail polishes/henna and artificial nails at the time of capillaroscopy does not induce significant misinterpretation of capillaroscopy reports. The removal of them 10 days before the capillaroscopy time does not improve the procedure artifacts, or it may increase the artifacts too.

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Data availability All data and materials in this article are available from the corresponding author on reasonable request.

Compliance with ethical standards

Ethics approval and consent to participate The ethics committee of Shiraz University of Medical Sciences approved this study (Ethical code: IR.SUMS.MED.REC.1401.380). Patients' information was anonymized before data analysis and confidentiality of patient information was guaranteed and protected.

Disclosures None.

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