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## Diagnosis of hair disorders during the COVID-19 pandemic: an introduction to teletrichoscopy

### To the Editor

The COVID-19 pandemic has limited dermatologic care with >50% decrease in the number of patients seen and biopsies completed.<sup>1</sup> Even after this pandemic has passed, social distancing may limit the number of patients seen in-person and telemedicine will likely play a larger permanent role.

Teletrichology describes the use of telecommunication platforms to interact with hair disorder patients remotely and to select patients who need in-person consultation for diagnostic or therapeutic procedures. Teletrichology is excellent for both initial and follow-up examinations of patients with different types of hair loss including telogen effluvium, androgenetic alopecia, alopecia areata and scarring alopecia. With teletrichology, dermatologist can effectively evaluate patients by instructing them to perform the pull/tug tests, measure thickness of the ponytail, measure distance from the hairline to the glabella and show daily/shampoo hair shedding. Since April 2020, one of the authors has visited 235 patients using teletrichology and teletrichoscopy.

Trichoscopy is a valuable diagnostic tool to differentiate inflammatory, infectious, scarring and non-scarring conditions.<sup>2</sup> However, some concerns regarding the use of trichoscopy during the COVID-19 pandemic have recently been raised due to the possible risk of viral contamination of hair. Although, currently,

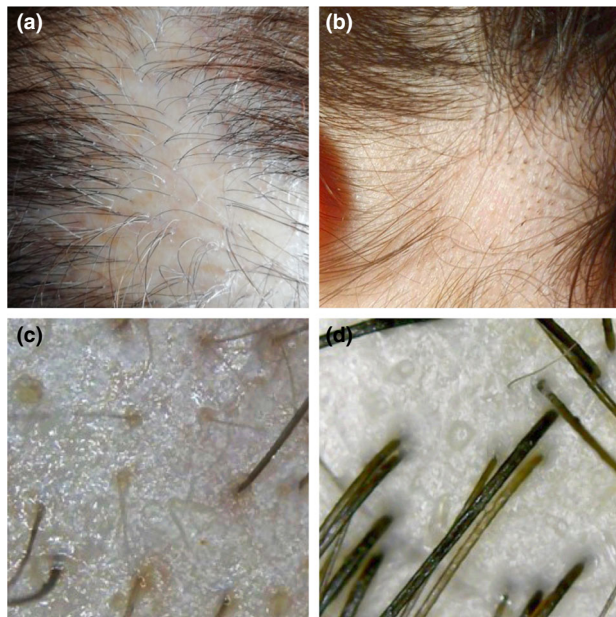
**Table 1** Summary of appropriate teletrichology clinical evaluations that can be completed during hair disorder consult

Hair condition	Teletrichology visit evaluations	Instrument	Instrument findings
<b>Telogen effluvium</b> †	Pull test Hair shedding Ponytail measure	Macro-imaging app/handheld microscope	Lack of hair shaft variability
<b>Alopecia areata</b> †	Pull test SALT PGA	Macro-imaging app	Yellow dots Broken hairs Exclamation mark hairs
<b>Androgenic alopecia</b> †	Pull test Hair shedding Ponytail measure	Macro-imaging app/handheld microscope	Hair shaft variability
<b>FFA</b> §	Measure hairline distance from glabella	Macro-imaging app/handheld microscope	Absence of vellus hair
<b>CCCA</b> ¶	Clinical pattern suggests diagnosis	Macro-imaging app/handheld microscope	Hair shaft variability
<b>Other scarring alopecias</b> †	Patchy alopecia	Macro-imaging app/handheld microscope	Absence of follicular openings and peripilar casts

Type of instrument patient can use remotely and findings that can be seen in each disorder. Additionally, recommendations on telemedicine or in-person follow-up and treatment have been provided.

CCCA, central centrifugal cicatricial alopecia; FFA, frontal fibrosing alopecia; PGA, Physician Global Assessment score; SALT, severity of alopecia score.

†Treat and follow up with telemedicine. ‡Treat and follow up with telemedicine except for patients requiring intralesional corticosteroid treatment. §You can diagnose and follow up with telemedicine, in-person visit only required to confirm diagnosis with biopsy at first visit. ¶Need to see in person for biopsy and procedures.



**Figure 1** Images taken using smartphone applications at 10× magnification (a and b). (a) Peripilar casts in lichen planopilaris. (b) Broken hairs and black dots in alopecia areata. Images taken using handheld microscope at 50× magnification (c and d). (c) Yellow dots and short regrowing hairs in alopecia areata. (d) Hair shaft variability and empty follicles in female pattern hair loss.

no data exist examining the presence of COVID-19 on hair follicles or the risk of spread through the use of dermatoscopes, data exist showing that bacteria and HPV DNA can be detected on dermatoscopic lenses and the use of contact dermoscopy (which is used for trichoscopy) is not recommended.<sup>3–5</sup>

To overcome these limitations, we have successfully developed teletrichoscopy by instructing patients to use smartphone applications or inexpensive imaging attachments (Table 1).

Patients can then, safely, take images and share with their dermatologist. Low-cost or even free applications for macrophotography are available for both Apple and Android devices (Camera +2 for apple and Camera FV-5 for android). Macro-images are effective to assess presence of broken and exclamation mark hairs in alopecia areata, presence/absence of vellus hairs in frontal fibrosing alopecia, peripilar casts in scarring alopecias and hair shaft variability in androgenetic alopecia (Fig. 1a,b).

Low-cost handheld microscopes are another option and can be purchased for under \$40. Micali *et al.*<sup>6</sup> evaluated inexpensive handheld video microscope for trichoscopy and determined they could identify hair shaft variations, but struggled to identify other features such as yellow dots, white dots and perifollicular scales when compared to medical video dermatoscopes. However, improved technology and new instruments can detect yellow dots, perifollicular scales and casts among other features

(Fig. 1c,d). Instrument magnification ranges from 50× to 1000×, with 50× recommended for trichoscopy.

Successful teletrichology requires clear patient instruction on how to properly obtain the appropriate instruments/software and how to take useful images. Patients should take multiple images at specific locations on their scalp, hairline and temples. Patients should take images of the frontal and temporal hairline of the top of the scalp after central parting. Patients with patchy alopecia should take images from the centre and periphery of the patch. Even with clear instructions and multiple images, image quality may be limited due to the skill of the patient. This requires further instruction/training until useful images can be obtained.

The use of teletrichoscopy is a promising new option to maintain physician–patient contact and continue management of care.

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The patients in this manuscript have given written informed consent to the publication of their case details.

### Conflicts of interest

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