

Hairstyling Practices to Prevent Hair Damage and Alopecia in Women of African Descent

Amaris N. Geisler, BS; Oyetewa Oyerinde, MD; Deborah A. Scott, MD

Highly textured hair has been found to be more susceptible to breakage than other hair types due to an increased proportion of spirals and relatively fewer elastic fibers anchoring the hair follicles to the dermis. Women of African descent frequently employ hairstyles and hair treatments for ease of management and as a form of self-expression, but a number of these practices have been implicated as risk factors for alopecia. Herein, we provide an overview of hairstyles for patients with highly textured hair so that physicians may better identify high-risk hairstyles, provide individualized recommendations for safer alternatives, and manage and stop the progression of hair loss before it becomes permanent.

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Central centrifugal cicatricial alopecia (CCCA), traction alopecia, and acquired proximal trichorrhexis nodosa are 3 forms of alopecia that disproportionately affect women of African descent.¹ Central centrifugal cicatricial alopecia is characterized by a shiny smooth patch of hair loss over the vertex of the scalp that spreads centrifugally (Figure 1).¹⁻⁴ Traction alopecia results from prolonged or repeated tension on the hair root that causes mechanical damage, hair loss, and shortening of hairs along the frontotemporal line (the so-called fringe sign) (Figure 2).^{1,3,5} Acquired proximal trichorrhexis nodosa, a result of trauma, is identified by a substantial number of hairs breaking off midshaft during a hair pull test.¹ By understanding the unique structural properties and grooming methods of hair in women of African descent, physicians can better manage and stop the progression of hair loss before it becomes permanent.^{1,4,5}

The characterization of hair between and within ethnic groups is challenging and lies on a spectrum.^{6,7} Many early studies broadly differentiated hair in 3 ethnic subgroups: African, Asian, and Caucasian⁶⁻⁸; older descriptions of hair texture also included terms such as *straight*, *wavy*, *curly*, and *kinky*.⁶ However, defining hair texture should be based on an approach that is more

objective than an inaccurate ethnicity-based classification or the use of subjective, ill-defined, and overlapping descriptive terms.⁷ The segmentation tree analysis method (STAM) is an objective classification system that, when applied to hair, yields 8 curl-type groups (I=straight; VIII=tightly curly) based on curve diameter, curl index, number of waves, and twists.⁶⁻⁹ (We discuss the “tightly coiled” [group VII] through “tight, interwoven small curls” [group VIII] groups in the STAM classification of hair.)

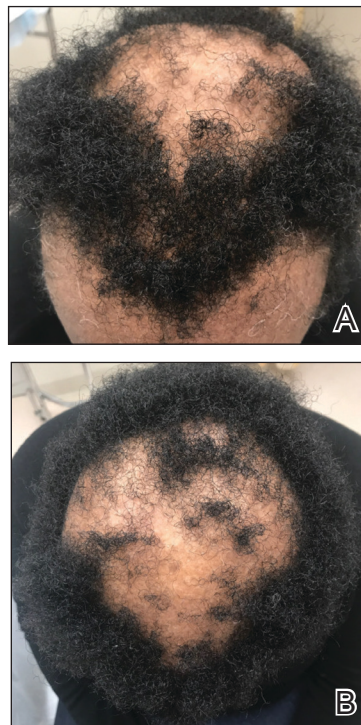


FIGURE 1. A and B, Central centrifugal cicatricial alopecia presenting as a shiny smooth patch of hair loss over the vertex of the scalp.

Ms. Geisler is from The CUNY School of Medicine, New York, New York. Drs. Oyerinde and Scott are from the Department of Dermatology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts.

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Correspondence: Amaris N. Geisler, BS, The CUNY School of Medicine, 160 Convent Ave, New York, NY 10031 (ageisle000@citymail.cuny.edu). doi:10.12788/cutis.0444



FIGURE 2. A, Fringe sign in traction alopecia. B, Clinical presentation of traction alopecia.

Highly textured hair has been found to be more susceptible to breakage than other hair types because of an increased percentage of spirals and relatively fewer elastic fibers anchoring hair follicles to the dermis.^{1-4,10,11} In a cross-section, the hair shaft of individuals of African descent tends to be more elliptical and kidney shaped than the hair shaft of Asian individuals, which is round and has a large diameter, and the hair shaft of Caucasian individuals, which structurally lies between African and Asian hair.^{1,2,4,11} This axial asymmetry and section size contributes to points of lower tensile strength and increased fragility, which are exacerbated by everyday combing and grooming. Curvature of the hair follicle leads to the characteristic curly and spiral nature of African hair, which can lead to increased knotting.^{2,4}

Practice Gap

Among women of African descent, a variety of hairstyles and hair treatments frequently are employed to allow for ease of management and self-expression.¹ Many of these practices have been implicated as risk factors for alopecia. Simply advising patients to avoid tight hairstyles is ineffective because tension is subjective and difficult to quantify.⁵ Furthermore, it might be unreasonable to ask a patient to discontinue a hairstyle or treatment when they are unaware of less damaging alternatives.^{3,5}

We provide an overview of hairstyles for patients who have highly textured hair so that physicians can better identify high-risk hairstyles and provide individualized recommendations for safer alternatives.^{1,3,5}

Techniques for Hair Straightening

Traditional thermal straightening uses a hot comb or flat iron^{1,2,4,12} to temporarily disrupt hydrogen bonds within the hair shafts, which is reversible with exposure to moisture.^{1,2,4,5} Patients repeat this process every 1 or 2 weeks to offset the effects of normal perspiration and environmental humidity.^{5,12} Thermal straightening techniques can lead to increased fragility of the hair shaft and loss of tensile strength.¹¹

Alternate methods of hair straightening use lye (sodium hydroxide) or nonlye (lithium and guanidine hydroxide) “relaxers” to permanently disrupt hydrogen and disulfide bonds in the hair shaft, which can damage and weaken hair.^{1-5,11,12} Touch-ups to the roots often are performed every 6 to 8 weeks.^{1,2}

Chemical relaxers historically have been associated with CCCA but have not been definitively implicated as causative.^{2,3,4,13} Most studies have not demonstrated a statistically significant association between chemical relaxers and CCCA because, with a few exceptions,¹³ studies have either been based on surveys or have not employed trichoscopy or scalp biopsy. In one of those studies, patients with CCCA were determined to be 12.37 times more likely to have used a chemical relaxer in the past ($P < .001$).¹³ In another study of 39 women in Nigeria, those who had frequent and prolonged use of a chemical relaxer developed scarring alopecia more often than those who did not use a chemical relaxer ($P < .0001$). However, it is now known that the pathogenesis of CCCA may be related to an upregulation in genes implicated in fibroproliferative disorders (FPDs), a group of conditions characterized by aberrant wound healing, low-grade inflammation and irritation, and excessive fibrosis.¹⁴ They include systemic sclerosis, keloids, atherosclerosis, and uterine fibroids. The risk for certain FPDs is increased in individuals of African descent, and this increased risk is thought to be secondary to the protective effect that profibrotic alleles offer against helminths found in sub-Saharan Africa. A study of 5 patients with biopsy-proven CCCA found that there was increased expression of platelet-derived growth factor gene, *PDGF*; collagen I gene, *COL I*; collagen III gene, *COL III*; matrix metalloproteinase 1 gene, *MMP1*; matrix metalloproteinase 2 gene, *MMP2*; matrix metalloproteinase 7 gene, *MMP7*; and matrix metalloproteinase 9 gene, *MMP9*, in an affected scalp compared with an unaffected scalp.¹⁴ Still, chemical relaxers weaken the hair shaft and follicle structure, increasing the possibility of hair breakage and allowing for inflammation and trauma to render negative follicular effects.^{3,13}

The following interventions can be recommended to patients who thermally or chemically treat their hair to prevent hair damage:

- Decrease the frequency of thermal straightening.
- Use lower heat settings on flat irons and blow-dryers.
- Thermally straighten only clean dry hair.
- Regularly trim split ends.
- Use moisturizing shampoos and conditioners.
- Have a trained professional apply a chemical relaxer, if affordable.

- Consider decreasing (1) the frequency of chemical relaxer touch-up (to every 8 to 10 weeks) and (2) the overall manipulation of hair. There is a fine balance between not treating often enough and treating too often: The transition point between chemically processed hair and grown-out roots is a high-tension breakage point.

- Apply a thick protective emollient (known as scalp basing) to the scalp before applying a relaxer^{1,5}; this protects the scalp from irritation.

Techniques for Braids, Weaves, and Twists

Braids and cornrows, sewn-in or glued-on extensions and weaves, and twists are popular hairstyles. When applied improperly, however, they also can lead to alopecia.^{1-5,11,12} When braids are too tight, the patient might complain of headache. Characteristic tenting—hair pulled so tight that the scalp is raised—might be observed.^{3,5} Twists are achieved by interlocking 2 pieces of hair, which are held together by styling gel.^{1,4} When twists remain over many months, hair eventually knots or tangles into a permanent locking pattern (also known as dreadlocks, dreads, or locs).^{1,2,4} In some cases, the persistent weight of dreadlocks results in hair breakage.^{1,3,5}

The following recommendations can be made to patients who style their hair with braids or cornrows, extensions or weaves, twists, or dreadlocks:

- Apply these styles with as little traction as possible.
- Change the direction in which braids and cornrows are styled frequently to avoid constant tension over the same areas.
- Opt for larger-diameter braids and twists.
- Leave these styles in place no longer than 2 or 3 months; consider removing extensions and weaves every 3 or 4 weeks.
- Remove extensions and weaves if they cause pain or irritation.
- Avoid the use of glue; opt for loosely sewn-in extensions and weaves.
- Consider the alternative of crochet braiding; this is a protective way to apply extensions to hair and can be worn straight, curly, braided, or twisted.^{5,12}

Techniques for Other Hairstyling Practices

Low-hanging ponytails or buns, wigs, and natural hairstyles generally are considered safe when applied correctly.^{1,5} The following recommendations can be made to patients who have a low-hanging ponytail, bun, wig, or other natural hairstyle:

- Before a wig is applied, hold the hair against the scalp with a cotton, nylon, or satin wig cap and with clips, tapes, or bonds. Because satin does not cause constant friction or absorb moisture, it is the safest material for a wig cap.⁵
- Achieve a natural hairstyle by cutting off chemically processed hair and allowing hair to grow out.⁵
- Hair that has not been thermally or chemically processed better withstands the stresses of traction, pulling, and brushing.⁵

- For women with natural hair, wash hair at least every 2 weeks and moisturize frequently.^{5,12}

- Caution patients that adding synthetic or human hair (ie, extensions, weaves) to any hairstyle to increase volume or length using glue or sewing techniques^{1-4,11} can cause problems. The extra weight and tension of extensions and weaves can lead to alopecia. Glue can trigger an irritant or allergic reaction, especially in women who have a latex allergy.^{1,4,5,11}

Practice Implications

Women of African descent might be more susceptible to alopecia because of the distinctive structural properties of their hair and the various hair treatments and styles they often employ. Physicians should be knowledgeable when counseling these patients on their hair care practices. It also is important to understand that it might not be feasible for a patient to completely discontinue a hair treatment or style. In that situation, be prepared to make recommendations for safer hairstyling practices.

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