CHAPTER 3

Hair and Scalp Conditions

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Numbered citations in parentheses refer to the list in Chapter 10: References.

Can Tight Hairstyles Cause Hair Loss (Traction Alopecia)?

Each week, Dr. Stuart and I see many women for hair loss who have tight hairstyles and are unaware that this can be a common cause or contributing factor to alopecia. **Tight hairstyles can cause a form of hair loss called traction alopecia,** which develops when **repeated or prolonged pulling places excessive tension on the hair follicles**. Tight ponytails, buns, braids, cornrows, weaves, and hair extensions can all contribute, particularly when worn frequently or secured tightly. Thinning is often most noticeable along the frontal hairline and temples, although other areas of the scalp may be affected depending on where the tension occurs. Patients may notice broken hairs, tenderness, itching, or small bumps around the involved follicles. Early traction alopecia may improve when the pulling is stopped, but continued tension can eventually damage the follicles and cause scarring and permanent hair loss. [40]

How Is Traction Alopecia Diagnosed?

Dr. Stuart and I begin by asking about the patient's hairstyling habits, when the thinning began, and whether there has been scalp discomfort or repeated pulling on the affected areas. We examine the

distribution of hair loss and use a dermoscope, **which magnifies the scalp and hair follicles, to look for broken hairs, irritation, and other signs of traction-related damage**. We also assess whether the follicular openings—the small openings where hairs emerge from the scalp—are still visible, since their loss may suggest scarring. The history and examination help us distinguish traction alopecia from female pattern hair loss and other conditions that can affect the hairline. If the diagnosis remains uncertain or another form of scarring hair loss is suspected, a small scalp biopsy may be needed. [40]

How We Treat Traction Alopecia

The first and most obvious treatment is to **stop or reduce the pulling from tight hairstyles, extensions, or weaves**. [40] The use of oral or topical minoxidil may improve hair growth over several months. [40, 43] We typically follow patients every 3–6 months and measure hair follicle recovery with medical-grade photography and HairMetrix, an AI-assisted, noninvasive system used to objectively measure and track changes in hair growth. [42] The outcome can be unpredictable because some hair follicles may have already undergone permanent scarring. [40]

One of the most common questions patients ask us is whether their hair will grow back after they stop wearing tight hairstyles. In early traction alopecia, **regrowth is often possible once the repeated pulling is stopped**. [40] The potential for recovery depends on how long the tension has continued and whether permanent damage to the hair follicles has occurred. Once the follicles have been destroyed and replaced by scar tissue, they will not grow back. [40] This is why we emphasize early evaluation and changes in hairstyling habits before the hair loss becomes permanent. In patients with permanent hair loss, hair transplantation may be the ultimate solution to replace the damaged follicles. [40, 43]

What Is Alopecia Areata?

Although much less common than female pattern hair loss, alopecia areata (AA) is still one of the more common causes of hair loss. AA is an **autoimmune type of hair loss in which the body's own immune system attacks normal hair follicles**. However, unlike scarring alopecia, **the follicle is not permanently destroyed, so hair regrowth is still possible**. The areas of hair loss usually appear as patches that are smooth and circular or oval. Hair loss may also involve eyebrows, beard, and other body areas. In more extensive forms, there may be complete loss of scalp hair called alopecia totalis or loss of both scalp and body hair called alopecia universalis. Unlike scarring alopecia, the affected skin looks relatively normal in appearance without redness or scaling. [44]

How Is Alopecia Areata Diagnosed?

Sudden onset of hair loss is common in AA, and patients **often notice one or more patches over a relatively short period of time**. The affected areas of the scalp are usually smooth, often with short hairs seen around the periphery. Nail changes can occasionally occur, including small pits or surface irregularities. [44]

We examine the scalp carefully with a special non-invasive device called a dermoscope, which illuminates and magnifies the skin. When dermoscopy is used to examine the scalp and hair, it is called trichoscopy. Trichoscopy will often show characteristic signs of AA, including the classic "exclamation point hairs," which taper or narrow as they approach the scalp and resemble an exclamation point. Other findings may include yellow dots, black dots, and broken hairs. [45]

Trichoscopic appearance of AA. The red circle shows an "exclamation point hair." The blue circle shows yellow dots.

Trichoscopy is especially helpful in **distinguishing AA from other causes of patchy hair loss**, including trichotillomania, tinea capitis, traction alopecia, and early scarring alopecia. We can usually make the diagnosis using the clinical examination and trichoscopy, but occasionally a small scalp biopsy is necessary. The biopsy is then evaluated by our dermatopathologists to help confirm the diagnosis. [44, 45]

How Is Alopecia Areata Treated?

For patients with limited, patchy areas of hair loss, we can often use **intralesional steroid injections into the scalp**, which may be repeated every 4–6 weeks if necessary. Spontaneous regrowth can also occur, especially in patients with limited disease. [44, 46] However, **more extensive or rapidly progressive AA may require systemic therapy such as JAK inhibitors**, newer oral medications that reduce specific immune signals involved in attacking the hair follicles. These medications can produce significant hair regrowth in some patients but require careful patient selection and medical monitoring. [44]

What Is Trichotillomania?

Trichotillomania is a type of hair loss that occurs **when a patient repeatedly pulls out her own hair, often without fully realizing how frequently she is doing it**. It most often involves the scalp but can also affect the eyebrows and eyelashes. The hair loss usually appears as irregular patches rather than the smooth, round patches seen with alopecia areata. A characteristic finding is the presence of hairs broken at many different lengths within the affected areas. [47]

How Is Trichotillomania Diagnosed?

A trichotillomania diagnosis is **based on the pattern of hair loss, careful scalp examination including trichoscopy, and a thorough history**. Trichoscopy can demonstrate broken hairs at many different lengths, coiled hairs, flame hairs, and V-sign hairs. It is also helpful in distinguishing trichotillomania from alopecia areata, tinea capitis, traction alopecia, and early scarring alopecia. [47] Patients may not always recognize or disclose the hair-pulling behavior, so careful examination of the hair and scalp can be particularly important in establishing the diagnosis. A scalp biopsy may occasionally be useful when the diagnosis remains uncertain. We discuss this diagnosis without judgment. Trichotillomania is a behavioral disorder, and patients may need help controlling the pulling.

How Is Trichotillomania Treated?

Treatments for trichotillomania are directed at reducing the hair-pulling behavior and addressing associated anxiety, obsessive-compulsive features, or stress when present. Habit-reversal training and behavioral therapy are the primary treatments, which are usually administered under the direction of a psychologist or psychiatrist. [48] It is important to stop the hair pulling before it results in permanent follicular damage, as **hair regrowth is often possible if there has not been permanent scarring of the follicles**. Hair-loss medications may also be helpful when another associated hair-loss disorder is present.

Can a Fungal Infection of the Scalp Cause Hair Loss?

To answer the question: yes, **a fungal infection of your scalp can lead to hair loss**. The medical term is tinea capitis, or "scalp ringworm," which is a fungal infection of the scalp and hair shafts that can cause patchy hair loss. It is much more common in children but can also occur in adults, especially older women. Unlike alopecia areata, the affected areas of the scalp often show scaling, redness, and broken hairs rather than smooth skin. [49]

Trichoscopy is not diagnostic for tinea capitis, but findings such as comma hairs and corkscrew hairs can increase suspicion. [50] Fungal testing is usually required to establish the diagnosis, including a potassium hydroxide (KOH) examination of scalp scale or affected hairs to look for fungal elements under the microscope. Fungal culture may also be **indicated to identify the organism and help guide treatment**. [49, 51] Treatment requires oral antifungal medication **because topical agents alone do not adequately treat infection involving the hair shaft**. [49]

In more inflammatory cases, tinea capitis can produce a tender, swollen mass called a kerion, which may have pustules or drainage and carries a greater risk of scarring and permanent hair loss. Because of this, early diagnosis and prompt treatment are crucial for preventing progression and irreversible follicular damage. [49]

What Is Scarring Alopecia (Cicatricial Alopecia)?

Scarring alopecia, also called cicatricial alopecia, refers to a **group of inflammatory hair-loss disorders in which the hair follicle is progressively damaged and replaced by scar tissue**. Unlike many other forms of hair loss, once the hair follicle has been

destroyed, **the hair loss is permanent**. Early diagnosis is therefore particularly important because treatment is directed at stopping or slowing the inflammatory process before additional hair follicles are damaged. Women may notice progressive thinning in certain areas of the scalp, and may also experience itching, burning, tenderness, redness, scaling, or small bumps around individual hairs. Some women have few or no symptoms, which can make scarring alopecia more difficult to recognize in its early stages. [52, 53]

The appearance and location of the hair loss **depend upon the specific type of scarring alopecia**. Lichen planopilaris, frontal fibrosing alopecia, and central centrifugal cicatricial alopecia are important forms of scarring alopecia that affect women. Examination of the scalp with a dermatoscope or trichoscope can show characteristic changes, including loss of the normal follicular openings and inflammation around the remaining hair follicles. Scalp biopsy may be necessary to confirm the diagnosis and determine the specific type of scarring alopecia. [52, 53]

What Is Lichen Planopilaris (LPP)?

Lichen planopilaris (LPP) is an immune-mediated **inflammatory form of scarring alopecia that primarily affects the upper portion of the hair follicle, including the area where important hair follicle stem cells are located**. The resulting inflammation can progressively damage and eventually destroy the affected hair follicles, leading to permanent hair loss if the process is not controlled. [54]

LPP most commonly affects adult women, although it can occur in men as well. [55] The pattern of hair loss can be patchy or irregular, and may involve different areas of the scalp. Patients may notice itching, burning, tenderness, pain, redness, or scaling of the scalp, although some patients have few or no symptoms. On examination,

inflammation and scale are often seen around individual hair follicles, particularly at the active edge of the affected area. As the disease progresses, normal follicular openings may disappear, and the scalp may develop smooth areas of permanent hair loss. [54, 55]

The figure on the left is a clinical example of LPP showing patchy areas of hair loss. The figure on the right is a trichoscopic image demonstrating perifollicular scaling, erythema, and blue-gray dots.

Trichoscopy can be particularly helpful in identifying areas of active inflammation in lichen planopilaris. One of the characteristic findings is peripilar or perifollicular scaling, in which **scale or keratin forms a tubular or cylindrical cast around the hair shaft**. These are often referred to as peripilar casts. Perifollicular redness or erythema around individual hair follicles is another important sign of active inflammation. Blue-gray dots arranged around the hair follicle in a target-like pattern may also be seen and reflect pigment released as a result of the inflammatory process. As the disease becomes more advanced, there is progressive loss of the normal follicular openings, together with fibrotic white dots or smooth white areas representing scarring and permanent destruction of the hair follicles. [56]

A scalp biopsy is often helpful, and in some cases necessary, to confirm the diagnosis and distinguish LPP from other forms of scarring alopecia. [54] The primary goal of treatment is to **suppress the inflammation and prevent further follicular destruction**. Treatment generally cannot restore hair follicles that have already been permanently destroyed. Because LPP can sometimes progress despite relatively mild symptoms, early recognition and treatment are particularly important. [54, 57]

What Is Frontal Fibrosing Alopecia (FFA)?

Frontal fibrosing alopecia is also a type of scarring alopecia that is **characterized by progressive recession of the frontal and temporal hairline**. FFA is part of the lichen planopilaris spectrum because the inflammatory process and microscopic changes are closely related to those seen in LPP. [58] It occurs most often in postmenopausal women, although it can also affect premenopausal women and, less commonly, men. [58, 59] The hairline typically **recedes in a relatively smooth band across the forehead and temples**, producing a higher frontal hairline that may gradually progress over time. A loss of eyebrow hair is also quite common, sometimes developing even before elevation of the frontal hairline. Patients may also develop hair loss in other areas, including the sideburns, eyelashes, and body hair. [59, 60] Some patients notice itching, burning, tenderness, or redness along the hairline, while others have little to no discomfort. Small facial papules may also occur, particularly on the forehead and temples, and can be another clinical clue to the diagnosis of FFA. [59]

Clinical appearance of frontal fibrosing alopecia (FFA). Illustrative image showing band-like recession of the frontal and temporal hairline, eyebrow thinning, and isolated hairs remaining within the scarred frontal hairline.

Trichoscopic examinations of the scalp often demonstrate perifollicular redness, scaling, and tightly adherent peripilar casts around individual hairs near the advancing edge of the hairline. [59, 60, 61] Isolated terminal hairs may remain within the area of the receded hairline. This is often referred to as the “lonely hair sign” and is a characteristic clinical and trichoscopic finding in FFA. [59, 60, 61] Progressive loss of the normal follicular openings can also be seen. As

the disease advances, the affected areas may become smooth and shiny with permanent loss of follicular openings, indicating destruction and scarring of the hair follicles. [59, 61]

Trichoscopic appearance of frontal fibrosing alopecia (FFA) demonstrating perifollicular erythema, peripilar casts, reduced follicular density, loss of follicular openings, and isolated terminal hairs remaining within the receded frontal hairline, known as the lonely hair sign.

A scalp biopsy may be indicated **when the diagnosis is uncertain or when it is necessary to distinguish FFA from other causes of frontal hairline recession**. [58, 59] The primary goal of treatment is to suppress the inflammatory process and prevent or slow further recession of the frontal hairline. Hair that has been permanently lost because of follicular scarring generally cannot be restored with medical treatment, which makes early diagnosis particularly important. [58]

What Is Central Centrifugal Cicatricial Alopecia (CCCA)?

Central centrifugal cicatricial alopecia, or CCCA, is a form of scarring alopecia in which **inflammation progressively damages and destroys hair follicles, leading to permanent hair loss if the disease is not recognized and treated early**. CCCA most commonly affects women of African descent, but can also occur in women of other ethnic backgrounds. Visible signs of hair loss usually **begin at the crown or central portion of the scalp and gradually spread outward in a centrifugal pattern**, which is how the condition gets its name. [62, 63]

The earliest sign may be increased thinning at the crown, but many women may initially assume that the hair loss is caused by aging, genetics, or styling practices. Patients may also experience itching,

burning, tenderness, pain, or a tight sensation of the scalp, although some women have few or no symptoms. As the condition progresses, the affected scalp may become smooth and shiny, with loss of the normal follicular openings indicating scarring and permanent destruction of the hair follicles. Hair breakage can also occur and may make the early stages of CCCA more difficult to distinguish from other causes of hair loss. [62, 63]

Clinical appearance of central centrifugal cicatricial alopecia (CCCA), showing progressive thinning centered at the crown with centrifugal spread and reduced follicular density

Trichoscopy can be very helpful in identifying early disease, **sometimes before the scarring process is obvious on routine examination**. One of the most characteristic trichoscopic findings is a perifollicular white-gray halo surrounding affected hair follicles. Other findings can include **loss of follicular openings, reduced hair density, variations in hair shaft diameter, broken hairs, and perifollicular scaling**. [64] As CCCA progresses, **the normal follicular openings become increasingly absent as the follicles are replaced by scar tissue**. Trichoscopy can also help identify the most active area of disease, which is useful when selecting the best site for a scalp biopsy. [64, 65] Because permanent follicular destruction can occur before advanced hair loss becomes obvious, early diagnosis and treatment are important to preserve the hair follicles that remain. [62, 63]

Trichoscopic appearance of CCCA demonstrating reduced follicular openings, variation in hair shaft diameter, broken hairs, perifollicular scaling, and the characteristic perifollicular white-gray halo.

How Is Scarring Alopecia Treated in Women?

Treatment depends on the **type of scarring alopecia and whether inflammation is still active**. We try to control the inflammation before more follicles are destroyed. Once a follicle has been replaced by scar tissue, it generally cannot grow hair again. [52, 53]

Treatment options may include **topical or injectable corticosteroids, anti-inflammatory medications, and other systemic therapies**. Some patients require systemic treatment such as hydroxychloroquine, doxycycline, or other immunomodulatory medications, depending on the specific diagnosis and activity of the disease. [52, 53] For frontal fibrosing alopecia, antiandrogen therapy such as finasteride or dutasteride may be used in selected patients. Studies have shown that these medications can help stabilize progression in some patients with FFA. [60, 66] For CCCA, treatment is directed at controlling inflammation and preserving the remaining follicles. [67]

Minoxidil may be used as an adjunct **when there is associated nonscarring thinning or miniaturization of the hair follicles**, but it cannot restore follicles that have already been destroyed by scarring. [68] PRP and low-level light therapy may sometimes be considered as adjunctive treatments in selected patients; however, these treatments should not replace established anti-inflammatory therapy when active scarring alopecia is present. Evidence supporting PRP and other regenerative approaches in scarring alopecia remains limited compared with conventional anti-inflammatory treatment. [62]

As inflammation is brought under control, symptoms such as itching, burning, tenderness, pain, and redness often improve. Long-term follow-up is important because some forms of scarring alopecia can become active again after months or even years of stability. Serial photography and trichoscopy can help determine whether the disease is stable, improving, or progressing. [52]

Hair restoration procedures, including hair transplantation, should be considered only in carefully selected patients whose disease has remained inactive for a sustained period. Even when the disease appears stable, graft survival may be less predictable than in nonscarring forms of hair loss, and recurrence or reactivation of the underlying disease has been reported following transplantation. Patients should therefore understand that long-term results cannot be guaranteed. [69, 70]