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Pigmented Hair-Thickening Fibers: A Camouflage Technique for Alopecia in Patients with Epidermolysis Bullosa

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Dear Sir,

Scarring alopecia is a known consequence of epidermolysis bullosa (EB), a heterogeneous group of rare heritable skin fragility disorders caused by mutations in genes encoding adhesion proteins within the skin [1, 2]. Alopecia is well known to cause reduced quality of life [3, 4], further potentiating the morbidity associated with EB [5]. Treatment of alopecia in patients with EB poses a unique challenge because of fragile skin, blistering and wounds, with surgical treatments potentially making alopecia worse. To the best of our knowledge, no specific technique to improve the appearance of scalp alopecia in patients with EB has been published in the medical literature. We therefore aimed to explore the utility of pigmented hair-thickening fibers for the treatment of scalp alopecia in patients with EB.

Patients with EB and scalp alopecia were recruited at routine multidisciplinary EB patient visits. After consent for treatment and

publication of case notes and photographs, the patients' hair color was matched to a specific colored hair-thickening fiber which was then applied topically. The fibers were sprinkled on areas of alopecia using an applicator akin to a saltshaker and then combed through the hair to facilitate distribution. Patients were educated about the use of the pigmented hair-thickening fibers and asked to use them for 1 month, after which they were contacted to report any adverse events.

Three patients with alopecia and EB were recruited for the study. Patient 1, a 41-year-old Caucasian woman with generalized intermediate junctional EB (JEB) had light brown hair. She had a combination of diffuse scarring alopecia and traction alopecia. Patient 2, a 41-year-old Caucasian man, also with generalized intermediate JEB, had dark brown hair. He had a combination of scarring and androgenic alopecia. Patient 3, a 47-year-old Asian woman with recessive dystrophic EB (RDEB) inversa had black hair. Her alopecia was primarily due to scarring.

Immediately after the application, all patients had a notable improvement in the appearance of their alopecia (fig. 1–3). At the end of the 1-month follow-up period, the 2 patients with JEB continued to use the hair-thickening fibers, but the patient with RDEB stopped because of scalp pruritus due to the fibers. Of note, this patient had a prior history of sensitivity to hair products leading to secondary inflammation.

Hair-thickening fibers are one of many new ways to conceal alopecia [6], and Cossman et al. [7] have recently published a study about the effectiveness of hair-thickening fibers in camouflaging areas affected by androgenic alopecia. Hair-thickening fibers work by bonding to the hair by static electricity to make it appear thicker and fuller as well as by sitting on top of the scalp to provide direct



Fig. 1. Patient 1, a 41-year old woman with generalized intermediate JEB and scalp alopecia before and after the topical application of pigmented hair-thickening fibers.



Fig. 2. Patient 2, a 41-year old man with generalized intermediate JEB and scalp alopecia before and after the topical application of pigmented hair-thickening fibers.

Color version available online

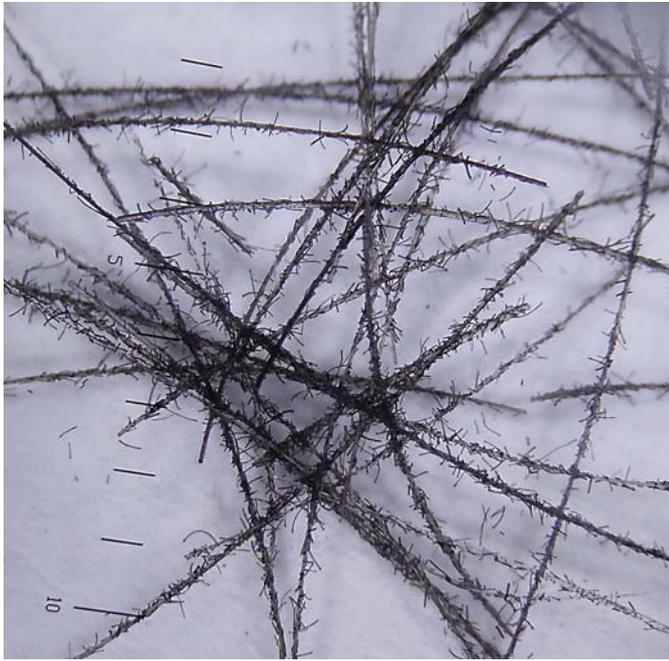


Fig. 3. Patient 3, a 47-year old woman with RDEB inversa and scalp alopecia before and after the topical application of pigmented hair-thickening fibers.

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camouflage (fig. 4) [8]. The hair-bonding property is a major benefit over other camouflaging techniques but has limited utility in areas of complete hair loss such as in patients with alopecia areata. Hair-thickening fibers tend to be made from either keratin or plant materials, which are dyed in a range of colors to match the patient's hair color. Manufacturers report irritation to be low, and some advocate for a fixative spray to be applied on top of the fibers to improve stability. In our group of patients, we did not use a fixative spray because of concerns about skin irritation. We would also advise against applying hair-thickening fibers to areas of blistered skin or wounds as this could lead to sensitization and future contact allergy to dyes within the fibers.

Patients with all subtypes of EB can get alopecia, although cicatricial alopecia predominantly affects patients with the severe subtypes of EB, generalized severe RDEB and generalized severe JEB [2]. This is because the affected proteins are present within hair follicles, leading to blistering, scarring and the destruction of hair follicles and subsequent alopecia [9, 10]. Patients with EB may develop other common causes of alopecia, including androgenic alopecia, telogen effluvium and traction alopecia [2]. Traction alopecia is particularly prevalent in female patients with severe EB due to hair and skin fragility combined with the trauma of tying the hair into a ponytail to cover existing areas of alopecia [2].



Color version available online

Fig. 4. Hair-thickening fibers selected to match black hair shown magnified through the dermatoscope.

Pigmented hair-thickening fibers may therefore be useful to camouflage areas of alopecia of the scalp in some patients with EB, but they need to be used with caution as they could cause pruritus leading to increased blistering.

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Statement of Ethics

The authors have no ethical conflicts to disclose.

Disclosures Statement

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