

Lichen Simplex Chronicus on the Scalp: Broom Fibers on Dermoscopy; Gear Wheel Sign and Hamburger Sign on Histopathology

Abstract

Lichen simplex chronicus (LSC) is characterized by lichenification of the skin because of primary excessive scratching. Herein, we present two cases of scalp LSC with a patch showing localized hair loss and paroxysmal severely itching on that area. Dermoscopy examined the presence of broom hair fibers while histopathological examination revealed gear wheel sign, hair shafts split in two (the hamburger sign), and decrease in the size of the sebaceous glands.

Keywords: *Broom fibers, gear wheel sign, hamburger sign, Lichen simplex chronicus*

Introduction

Lichen simplex chronicus (LSC) is characterized by a lichenified, often hyperpigmented plaque usually surrounded by lichenoid papules. The most common sites are the neck, ankles, scalp, vulva, pubis, scrotum, and extensor forearms.^[1] LSC on the scalp presents as a single or several irregular, oval, or polycyclic demarcated lesions with possible scaling, hair loss, or hair breakage.^[2,3] It can often be confused with trichotillomania, psoriasis, tinea capitis, or chronic folliculitis. In the current study, we present a useful tool to diagnose LSC on the basis of trichoscopic and histopathological findings.

Case Report

Case 1

A 30-year-old man presented with a patch of hair loss at vertex region of the scalp. He had a history of paroxysmal severe itching over the area for 6 months. There was no history of hair pulling or depression. The patient was a pharmacologist and reported workplace stress. On examination, an oval patch of size 3 cm × 2 cm with localized hair loss was observed. Within the patch, multiple small broken hairs of about 1-2 mm length were visible. Many of these hairs were found to have a grey tip resembling burning joss stick. [Figure 1a] Dermoscopic examination (Dino-Lite

AM4113TTM) revealed hair shafts with a distal split of the hair tips into two-three tiny hair endings. This hair shaft abnormality has been described as broom hair fibers. [Figure 1b and c]^[4-6] Histopathological examination in the horizontal section at the level of infundibulum showed the splitting of hair shaft into two parts, known as hamburger sign [Figure 1d]. Based on clinical, dermoscopic, and histopathological correlation a diagnosis of LSC was made.

Case 2

A 23-year-old man presented with localized paroxysmal severely itchy lesion over the scalp for 3 years. There was no history of hair pulling or depression or stress. On examination, there was a hyperpigmented plaque, approximately 1 × 1.5 cm in size, with mild scaling, noted over the occipital area. The hair on the lesion was broken [Figure 2a]. Dermoscopic examination (Heine NC1[®] polarized light) revealed hair shafts with a distal split of the hair tips into two to three tiny hair endings (broom hair fibers). Moreover, there was mild perifollicular scaling with hyperpigmentation. [Figure 2b]^[4-6]

Histopathological examination in horizontal sections at the level of the infundibulum and isthmus showed the outer root sheath forming jagged acanthotic projections, which together with the hair canal in

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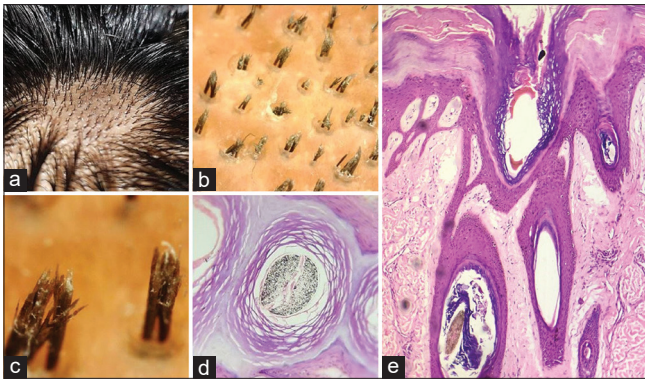


Figure 1: (a) A patch of localized alopecia at vertex area of scalp showing multiple small broken hairs of 1-2 mm in length with a grey tip resembling burning joss stick. (b) Hair shafts with a distal split of the hair tips into two-three tiny hair endings. This hair shaft abnormality has been described as broom hair fibers. (50 × Dino-Lite AM4113T™). (c) Broom fibers at higher magnification (200×, Dino-Lite AM4113T™). (d) Histopathological examination of skin biopsy in the horizontal section at the level of infundibulum showed the splitting of hair shaft into two parts, known as hamburger sign (40×). (e) Histopathological examination of skin biopsy in vertical section shows hyperkeratosis, hyperplasia, and scanty lymphocytic infiltrate in inter follicular area. (10×)

the middle resembled a gear wheel [Figure 2c]. The infundibular ostium showed hyperkeratosis with hair shafts split in two (the hamburger sign) [Figure 2d].^[4,5,7] At isthmus level, there was preserved follicular architecture with a normal number of terminal follicles and preserved terminal to vellus ratio. The interfollicular epidermis showed epidermal hyperplasia and hypergranulosis. The sebaceous glands were diminished in size and number. Further diagnosis of LSC was made.

Discussion

Lichen simplex chronicus is a cutaneous disorder characterized by lichenification of the skin as a result of intense excoriation secondary to excessive primary pruritus, becoming a self-perpetuating mechanism.^[1,8] It mostly affects female patients, with a peak incidence between ages 35 and 50 years.^[6] However, both of our cases were males.

Emotional stress in predisposed subjects may play a key role in inducing itch, thus provoking scratch. This itch-scratch cycle can lead to the development of LSC or prurigo nodularis. LSC which is also known as circumscribed neurodermatitis; is characterized by a central lichenified plaque thickened and often hyperpigmented plaques, usually surrounded by lichenoid papules and, along the borders with surrounding normal skin, by an indefinite zone of slight thickening.^[1] The scalp is one of the common sites for LSC.^[2] LSC on the scalp presents as a single or several irregular, oval, or polycyclic demarcated lesions with possible scaling, hair loss, or hair breakage.^[2,3] The most striking difference in the scalp, however, is the marked scaliness. These patches are usually thickly covered with fine, adherent, greyish scales so that the underlying color is hardly seen.

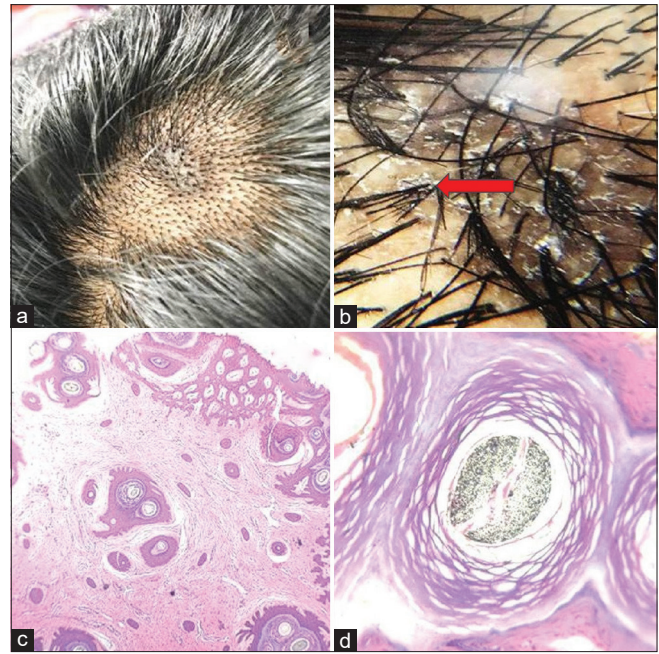


Figure 2: (a) A hyperpigmented plaque, approximately 1 × 1.5 cm in size, with mild scaling over the occipital area. The hair on the lesion is broken. (b) Dermoscopic examination showing broom hair fibers (Red Arrow) and mild perifollicular scaling (10×, Heine NC1® polarized light). (c) Histopathological examination of skin biopsy showing the outer root sheath forming jagged acanthotic projections, which together with the hair canal in the middle resemble a gear wheel (10×, horizontal sections at the level of the infundibulum and isthmus). (d) The hamburger sign (40×)

Blood crusts are seldom seen, in spite of the intensity of the itching as described by the patient.^[2] Dermoscopy of the scalp affected by lichen simplex chronicus shows erythema and scaling associated with shaft breakage, at the level of the scalp, into two or three shafts, hence appearing as short hair emerging from the single follicular unit. Such an abnormality is described as “broom fibers.”^[4,6] The present reports revealed broom fibers as well as erythema and perifollicular scaling. The broom hairs identified on dermoscopy have been reported in trichotillomania.^[5] The presence of broken hairs at different lengths, amorphous hair residues and black dots, irregular coiled hairs and yellow dots^[5,9] as well as the absence of lichenification distinguishes trichotillomania from LSC.^[10] Histopathological features of LSC include epidermal hyperplasia, orthokeratosis, and hypergranulosis with regular lengthening of the papillary ridges. Perivascular infiltration of lymphocytes and eventually macrophages can also be seen.^[8] In scalp lesions, preservation of follicle architecture, with a normal number of terminal follicles but with a decrease in size and number of sebaceous glands is there. At the infundibulum level, the outer root sheath forms acanthotic jagged projections, termed “gear wheels.” The infundibular ostium shows hyperkeratosis with hair shaft split into two segments by a layer of erythrocytes, called the “hamburger sign.”^[4] On pathological examination, the broom hair fibers correspond to hair shafts split into two

or rarely into three pieces at the level of infundibulum, which resembles a hamburger.^[4] The hamburger sign was originally reported in trichotillomania as an auxiliary diagnostic finding.^[7] In the present case reports, we observed the hamburger sign, the gear-wheel sign, preserved a follicular architecture with a normal number of terminal follicles, and decrease in size and number of sebaceous glands. For treatment, high-potency topical or intralesional corticosteroids are usually used. Capsaicin topical and tacrolimus are also helpful. Psychotherapy is recommended as an adjuvant treatment.^[1,8]

Conclusion

Lichen simplex chronicus (LSC) is a cutaneous disorder characterized by lichenification of the skin as a result of intense excoriation. Emotional tensions in predisposed subjects may play a key role in inducing itch, thus provoking scratch orientation secondary to excessive primary pruritus, becoming a self-perpetuating mechanism. LSC can be diagnosed bedside by simple dermoscopic examination showing broom hair sign. In addition, biopsy findings and signs such as gear wheel sign will help in confirmation of diagnosis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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