# Scarring Alopecia in Psoriasis

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**Scalp biopsies were taken from 3 patients with a scarring alopecia associated with severe scalp psoriasis. The histological findings in each case showed inflammatory destruction of the infundibular region of the hair follicle. The similarity of these changes in each case strongly suggests an association with the psoriasis.** ***Key words: Scalp folliculitis; Horizontal sections.***

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Loss of scalp hair is a recognized feature of various forms of psoriasis, particularly acute erythrodermic psoriasis, and chronic plaque psoriasis in childhood (1). In the majority of such cases hair regrows once the psoriasis is in remission. However, one report suggests that psoriasis may also cause a destructive alopecia though only brief mention is made of the histological changes in these cases (2). We have seen 3 adults with scalp psoriasis and scarring alopecia. The clinical and histological features in these cases are described.

## CASE REPORTS

In each case an elliptical skin biopsy was taken through the edge of an area of hair loss. This was bisected longitudinally and processed routinely for light microscopy. One half was sectioned in the standard way, that is vertically with respect to the skin surface. The other half was subjected to serial horizontal sectioning.

*Case 1*

A 24-year-old male with a 19-year history of psoriasis which had never been pustular or erythrodermic presented with a 1-year history of worsening of psoriasis on the scalp. Examination revealed the psoriasis to be localized to the scalp with areas of severe crusting and some pustule formation. There was an area of alopecia approximately 5 cm in diameter over the vertex (Fig. 1). A swab from this area produced a moderate growth of *Staphylococcus aureus*. No fungi were seen in a wet preparation or grown on culture.

*Fig. 1.* Case 1: Scarred alopecia.

A biopsy through the edge of an area of hair loss showed almost total loss of hair follicles within the bald area. In the dermis there was a chronic inflammatory infiltrate surrounding the upper permanent infundibular portion of the surviving hair follicles. Some follicles also showed features of an acute folliculitis with collections of neutrophils in the pilosebaceous duct which in places invaded through the infundibular wall (Fig. 2). These inflammatory changes were associated with progressive destruction of the follicular epithelium. Changes were patchy in nature, severely damaged hair follicles being found adjacent to apparently normal ones (Fig. 3). The epidermis between the hair follicles showed changes of psoriasis.

*Fig. 2.* Case 1: Hair follicle infundibulum showing acute folliculitis. H&E, ×200.

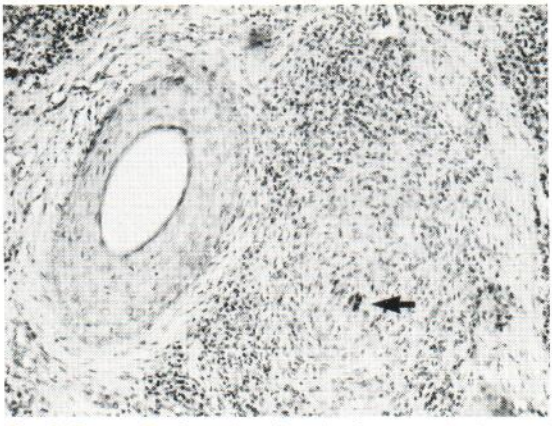

*Fig. 3.* Case 1: Horizontal section showing severely damaged hair follicle (→) in close proximity to a normal follicle. H&E, ×200.

He was treated with coconut oil, tar shampoo and oral flucloxacillin. Follow-up examination at 3 months revealed no scaling or inflammation of the scalp. The area of alopecia remained unchanged.

*Case 2*

A 78-year-old female presented with a 50-year history of psoriasis which had never been pustular or erythrodermic. She had required four hospital admissions for treatment. Her scalp had been severely affected at times. Examination revealed chronic stable plaque psoriasis on the limbs and trunk. There was scaling around the scalp margin, but otherwise no

*Fig. 4.* Case 2: Patchy scarred alopecia.

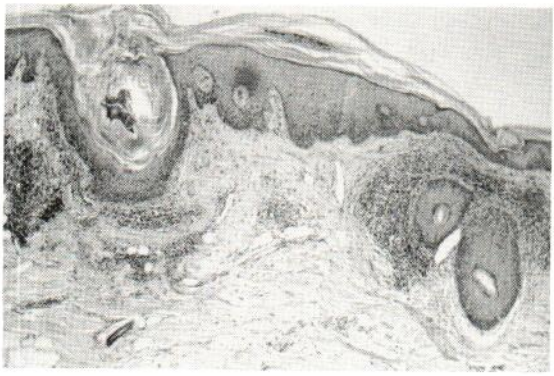

*Fig. 5.* Case 2: Lymphocytic infiltrate around surviving hair follicles in the upper dermis. H&E, ×200.

scalp involvement. There was an area of patchy alopecia over the vertex (Fig. 4).

The scalp biopsy showed very sparse hair follicles. Sebaceous glands were completely absent. A patchy lymphocytic infiltrate was present in the upper dermis which was localized around surviving hair follicles (Fig. 5). There was extensive liquefactive degeneration of the basal layer of the infundibular epithelium. In places the infiltrate was invading the follicle wall. Hair follicles were much easier to visualize in horizontal sections. Changes were again patchy in nature, affected and normal hair follicles being found in close proximity to each other (Fig. 6). Deeper sections showed absence of the infiltrate around the lower portion of the hair follicles.

Her psoriasis cleared following standard treatment with dithranol. Follow-up examination at 3 months showed no change in the appearance of the scalp.

*Case 3*

A 31-year-old female presented with a 20-year history of psoriasis which had never been pustular or erythrodermic. She had required hospital admission on three occasions. Her scalp was often the worst affected site. She had received PUVA therapy for a 5-month period 10 years previously but

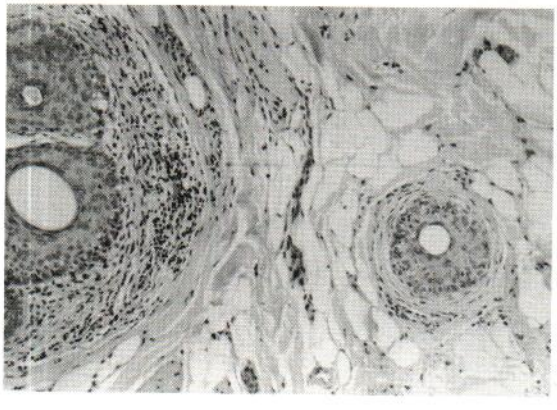

*Fig. 6.* Case 2: Horizontal section demonstrating patchy nature of changes. H&E, ×200.

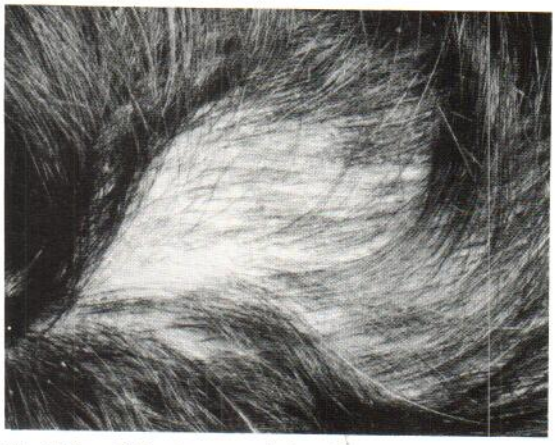

*Fig. 7.* Case 3: Patchy scarred alopecia.

otherwise treatment had always been with topical agents. Examination showed moderately extensive stable plaque psoriasis on the trunk and limbs. There was severe scaling with adherent crust formation on the scalp. Over the vertex there was a patchy alopecia (Fig. 7).

The scalp biopsy showed a patchy lymphocytic infiltrate around hair follicles in the upper dermis. In some areas there was complete destruction of the upper permanent part of the hair follicle (Fig. 8). Where follicle epithelium had been completely destroyed, naked hair shafts could be seen lying free in the dermis. These were surrounded by a granulomatous infiltrate consisting of macrophages and foreign body giant cells (Fig. 9). Horizontal sectioning again revealed the patchy nature of the inflammatory changes around the hair follicles with thinning of the follicular epithelium.

The scalp was treated with coconut oil, topical steroids and tar shampoo. Follow-up at 3 months revealed considerable improvement in the psoriasis, but no change in the hair loss.

*Fig. 8.* Case 3: Remnants of hair follicle epithelium (→) with associated lymphocytic infiltrate in the upper dermis. H&E, ×200.

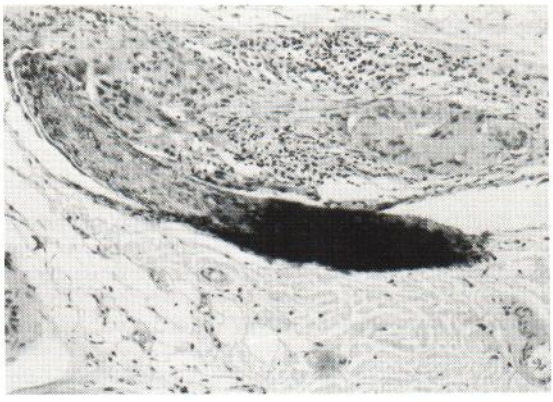

*Fig. 9.* Case 3: Naked hair shaft in dermis with surrounding granulomatous infiltrate. Hair follicle epithelium has been completely destroyed. H&E, ×200.

## DISCUSSION

Each of our cases showed similar histological features. The most consistent change was an accumulation of chronic inflammatory cells around the infundibular region of the hair follicle. This was associated with progressive destruction of the follicular epithelium and loss of sebaceous glands. Complete destruction of follicular epithelium sometimes resulted in keratinized hair shafts lying free in the dermis and provoking a granulomatous reaction. Case 1 also showed features of an acute folliculitis, possibly due to superimposed staphylococcal infection.

The use of horizontal sectioning to study hair follicle pathology has been advocated by Headington (3). Combining serial horizontal sectioning with routine vertical sectioning has a number of advantages. Where there is a decrease in the number of hair follicles, these are much easier to visualize in horizontal sections. Inflammatory changes, particularly if patchy, may be missed in vertical sections and are best assessed in horizontal sections, as was the case in each of the 3 subjects studied here. Serial step sectioning also allows the depth of involvement of the inflammatory changes to be readily assessed.

The histological changes noted are not specific for psoriasis. Indeed, in our experience, destruction of the upper permanent portion of the hair follicle is a feature common to all scarring alopecias. Naked hair shafts in the dermis provoking a foreign body reaction are also frequently found, particularly if transverse sectioning is used. This is in contrast to the non-destructive changes of alopecia areata where inflammation occurs around the lower transient portion of the hair follicle.

It is possible that the alopecia in the 3 patients reported here was due to causes unrelated to their psoriasis. However, the similarity of the changes in each case, the long history of severe scalp involvement and the absence of any other causes for the alopecia strongly suggests an association with the psoriasis. The clinical and pathological classification of scarring alopecias is difficult and controversial. The correct diagnosis may be apparent if specific histological features are present or if typical skin lesions (e.g. lichen planus) are present elsewhere on the skin. Frequently, however, such signs are lacking. Various inflammatory diseases affecting the scalp may cause follicular destruction, e.g. kerion, folliculitis decalvans (4), severe seborrheic eczema (5), probably as a non-specific secondary phenomenon. We feel that psoriasis should be included in this group, and that severe psoriasis of the scalp may cause inflammatory changes which result in a scarring alopecia.

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