PERSONAL PRACTICE

Hair loss in children

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There are many causes of hair loss in children and I shall mention some of these (table), but I will deal in more detail with alopecia areata and with children who pull their hair.

Normal hair growth in children has been reviewed recently.¹

Aplasia cutis and other scarring alopecias

Congenital absence of skin (aplasia cutis) presents on the scalp as one or more non-inflammatory well defined oval or circular ulcers, crusted areas (fig 1) or as scars. Lesions usually occur over the vertex in or adjacent to the midline and may involve skin only or occasionally may extend deeply to bone and dura. Complications include secondary infection, bleeding, and meningitis with deeper lesions. Occasionally other developmental defects are present and there may be a family history of aplasia cutis.²

PROGNOSIS AND MANAGEMENT

Most lesions are superficial and heal over a period of many weeks, leaving an area of scarring alopecia and this is how they often present. Larger defects may require excision and use of tissue expanders before closing the deficit. Before plastic surgery use of protective helmets and rubber skull caps will protect the aplastic area.

Other causes of scarring alopecia include physical injuries such as burns or uncommonly after prolonged localised scalp pressure as at

Causes of hair loss in children

Aplasia cutis/other scarring alopecias
Sebaceous naevus
Hereditary
Telogen effluvium
Chemical
Endocrine
Nutritional
Ringworm
Alopecia areata
Trauma:
Traction
Loose anagen
Shaft defects
Pulled hair

surgical operation, severe bacterial, viral, or fungal infections and uncommon conditions such as chronic folliculitis, sarcoidosis, or frontoparietal morphea.

Sebaceous naevus

This is an uncommon, usually small, congenital lesion containing both epidermal and dermal elements. Most common over the scalp and usually single, it appears as a smooth slightly raised hairless waxy plaque, yellow orange in colour and linear or slightly oval in shape. It becomes thickened and more raised during late childhood and adolescence (fig 2). Benign or malignant transformation, particularly basal cell carcinoma, is not uncommon in these lesions and usually occurs from the fourth decade: excision is thus advised in adolescence or early adult life.

Hereditary hair loss

When occurring as an isolated finding, hair loss

Figure 1 Aplasia cutis. Figure shows a 3 week old infant with crusted area. Local infection responded to topical applications. The boy also had congenital heart disease. Ten years on he is fine after scalp and cardiac surgery. He has a cousin with minor aplasia cutis as an isolated finding.

Figure 2 Sebaceous naevus. Figure shows a raised hairless scalp naevus in a 17 year old male.

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Figure 3 Hypohidrotic ectodermal dysplasia. Figure shows a 14 month old boy with sparse fair hair and characteristic profile.

is usually an autosomal dominant trait and eyebrows and eyelashes may be affected as well as the scalp and loss is usually permanent. However, sparse hair is most commonly just one component in many genodermatoses such as hypohidrotic (fig 3) (X linked recessive) and hidrotic (autosomal dominant) ectodermal dysplasia, Rothmund-Thomson syndrome (autosomal recessive), focal dermal hypoplasia (X linked dominant – affected individuals may also get aplasia cutis), and acrodermatitis enteropathica (autosomal recessive).

Telogen effluvium

Any severe physical (for example febrile illness, surgery) or mental stress (for example depression) may induce hair loss. Typically, diffuse hair loss occurs 3–4 months after the stress because of premature conversion of growing (anagen) hairs to the resting phase (telogen): loss continues for a few months but regrowth follows.

The temporary diffuse loss of hair in infants during the first few months of life and maternal postpartum hair loss are other examples of telogen effluvium but both head movement and pressure also contribute to the common occipital hair loss in infants.

Chemical hair loss

Toxic hair loss is seen with antimetabolites, alkylating agents, and mitotic inhibitors all of which inhibit synthesis of hair in growing (anagen) follicles and hair is lost (anagen effluvium). Regrowth usually recurs when drug administration is discontinued: irradiation can similarly cause temporary or permanent scalp hair fall.

Hypervitaminosis A, synthetic retinoids, anti-

thyroid drugs, anticoagulants, and sodium valproate may cause hair loss and many other drugs have been reported as causing alopecia but incriminating evidence and mode of causation are not always clear.

Endocrine causes

Hair loss may be seen in hypopituitarism, hypothyroidism and hyperthyroidism,³ hypoparathyroidism, and in poorly controlled diabetes mellitus.

Nutritional deficiency

Hair loss may occur with deficiencies of iron, biotin, zinc, and essential fatty acids and, of course, in marasmus. Diffuse alopecia is one of the features of anorexia nervosa.⁴

Scalp ringworm

Ringworm affecting the scalp (tinea capitis) is primarily a disease of children.⁵ Organisms invade the hair shaft and stratum corneum of the epidermis.

DIAGNOSIS

Infection is acquired from other humans (that is anthropophilic) or animals (that is zoophilic) and clinical appearances depend on infecting species and host inflammatory response. The most marked presentation with swollen pustular areas is known as kerion and is usually caused by a zoophilic species. Infection from cats and dogs (due to *Microsporum canis*) is characterised by hair loss and broken off hairs with a varying degree of scalp erythema and scaling. Hairs infected with *Microsporum audouinii* (an anthropophilic fungus) or *M canis* fluoresce green under a Wood's light and this is a useful mass screening procedure. *M canis* predominates as a cause of tinea capitis in the UK, and *Trichophyton tonsurans* dominates in the USA mainly affecting the black population. *Trichophyton violaceum* is the most common cause in India, Kenya, and parts of North Africa and *Trichophyton soudanense* (fig 4) is important in Central and West Africa. Immigrants can bring such species into Britain but even when born in Britain such children may be infected by fungi endemic in their countries of origin.

A diagnosis of ringworm can be confirmed by observing fungal elements in microscopic preparations softened with potassium hydroxide, but culture is required to identify the particular fungus concerned.

MANAGEMENT

With anthropophilic infections children should be kept away from school for a short period if practical, until they are non-infective and after contacts have been screened, because of the risk of spreading infection to other children. In treating scalp ringworm oral griseofulvin (10 mg/kg body weight/day) is prescribed for 4–6 weeks in addition to a topical imidazole antifungal and a medicated shampoo.

Figure 4 Scalp ringworm (*T soudanense*). Patchy scalp hair fall appeared in these 6 year old Nigerian twin girls four months after arriving in Liverpool. Affected areas showed mild inflammation and scaling.

Alopecia areata⁶

Alopecia areata has been recognised since antiquity and is recorded in the Papyrus Ebers with suggested remedies.⁷ It is the most common form of hair loss in children but an onset before 2 years is unusual. No specific cause has been found but it is likely that an immune mechanism is involved. A small percentage of affected individuals show an increased frequency of organ specific autoantibodies directed against various tissues. Up to one third of patients have a family history of the condition (fig 5). Stress has a possible precipitating role in some cases.

The initial event in alopecia areata is premature entry of anagen follicles into telogen, although some follicles survive for a time in a dystrophic anagen state.⁸

Figure 5 Alopecia areata. Patch of hair fall occurred at the same time in father (aged 24) and son (aged 4).

DIAGNOSIS

One or more sharply defined oval or round patches of complete hair loss produce an egg shell appearance over the scalp, although any hair bearing area may be affected. Early patches may show an irregular outline. The disorder is characteristically asymptomatic. In the active phase, pathognomonic club hairs, with broken off tips, so called exclamation mark hairs, may be seen, particularly at the margin of the area of hair loss. Regrowing hair initially tends to be fine and unpigmented.

MANAGEMENT

I explain the condition in simple terms to parents and older children emphasising the good prognosis with scanty patches and being more wary about widespread or recurrent loss.

Because of the likelihood of spontaneous regrowth, I commonly prescribe a shampoo, and a mild cream such as sulphur 2%, salicylic acid 2% in aqueous cream BP. For more extensive loss I often prescribe dithranol, usually in the form of a cream; initially 0.1% is applied for 10–30 minutes at night, and then washed off with soap and water or shampoo; the cream may stain the skin and concentration should not be increased if irritation is at all marked; however, irritation is not a prerequisite for hair regrowth with dithranol. I have no personal experience of the use of topical immunotherapy⁹ and I do not normally prescribe corticosteroids in any form. I recommend a wig for alopecia totalis in the preschool child but the older child may be more embarrassed wearing one than not doing so. A wig is indicated for extensive alopecia areata in Down's syndrome, a disorder associated with an increased frequency of the condition.

Figure 6 Trichotillomania. Girl aged 9 years showing bizarre distribution of hair loss.

PROGNOSIS

The prognosis is generally good when there are few patches of hair loss, with likely regrowth in 6–12 months. However, the condition may recur. The more extensive the loss, the more guarded should be the prognosis. Occipital patches tend to regrow very slowly. When associated with atopy prognosis also tends to be poor. Nail changes including pitting and distortion of the nail plate, sometimes occur, particularly with extensive alopecia. Rarely, all scalp hair (alopecia totalis) or all body hair (alopecia universalis) may be lost and this tendency seems to be greater in children than adults.

Traumatic hair loss

Traction alopecia can be caused by accidental trauma such as various ethnic hair styles, pony tails and other trendy styles, tight rollers, and hot combing. Hair loss may occur in atopic dermatitis due to persistent rubbing and in scalp psoriasis where loosened hair may be lost.

Loose anagen syndrome is a recently described entity¹⁰ in which the hair is not fragile but is easily and painlessly plucked: it seems to occur more commonly in fair haired young children and improves with time. Some familial cases have been reported.¹¹

Structural defects of the hair shaft (visible microscopically) may be associated with *increased fragility* and may present spontaneously as hair loss or as loss after mild trauma. Such defects include the most common one *trichorrhexis nodosa* (nodes easily fracturing with trauma) and the autosomal dominant *pili torti* (twisting of hair that appears spangled). These defects may occur as isolated findings or in conditions such as the sex linked recessive Menkes' (kinky hair) syndrome and the autosomal recessive Netherton's syndrome, although a bamboo-like hair defect (*trichorrhexis invaginata*) is more characteristic of Netherton's syndrome.¹² *Trichorrhexis nodosa* may occur in the dominant hereditary woolly hair. *Monilethrix* (beaded hair) is another shaft defect, inherited as a dominant trait.¹³ *Trichothiodystrophy* describes brittle hair with a low sulphur content¹⁴; it is inherited as an autosomal recessive trait.

Scalp hair fall may also be *inflicted by others*.

Children who pull their hair

Children who pull their hair are relatively common but the problem receives little or no attention in standard paediatric texts. Affected children and even their parents may sometimes be unaware that the hair loss is self inflicted. It is seven times more common in children than in adults.¹⁵ Although most affected individuals are girls, under the age of 6 years it is more common in boys.

The term 'trichotillomania' was coined by Hallopeau¹⁶ to emphasise the 'pulling', although Besnier preferred 'trichomania'. One should note that the term mania is not being used in its well defined modern sense. The *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association defines trichotillomania as an irresistible urge to pull the hair

and a sense of relief after the hair has been plucked.¹⁷

AETIOLOGY

Hair pulling may occur as an isolated habit, out of the blue, and without obvious explanation. Minor pulling and hair loss is a habit commonly associated with boredom. In children with hair loss sufficiently marked to be referred to a hospital dermatology clinic hair pulling is usually a sign of chronic social deprivation and particularly emotional deprivation in the maternal relationship; in a few of these children there may be progress to obsessive-compulsive disorder. Occasionally, neuroses such as anxiety and obsessive-compulsive disorder may be primary. Rarely, depression is the underlying cause.

DIAGNOSIS

The younger child often admits to pulling the hair but the more severely affected older child usually denies touching the hair. I do not usually ask a patient whether their loss is self inflicted at least not until I've seen him/her a few times and there is good rapport. Sometimes their comments can be revealing: one older girl who denied pulling said to me that 'as my hair regrows it feels like it is being pulled out'.

Hair is lost most frequently from a frontoparietal region but the loss can affect elsewhere. In the affected area twisted hairs and broken hairs of varying length will be visible. In more severe cases plucking may be extensive so that only a margin of hair remains. Rarely hair away from the scalp may be plucked. Although clinical diagnosis is usually straightforward with the affected area appearing bizarre and ill defined, differential diagnosis includes ringworm where the bald areas are usually scaly, and alopecia areata. In contrast to alopecia areata, histopathology in trichotillomania reveals neither inflammation of the hair bulb nor atrophic anagen hairs.¹⁸

It is quite common for hair loss due to pulling to be preceded by an episode of alopecia areata; perhaps the attention given activates an inherent susceptibility to pull in these children. The very common nail biting (onychophagia) and nail pulling (onychotillomania) may coexist with hair pulling. Bulimia nervosa has been reported to follow trichotillomania.¹⁹ Pulled hairs may sometimes be swallowed (trichophagy) and can result in intestinal obstruction caused by a hairball (trichobezoar).

Case histories

CASE 1

A 9 year old girl presented with a one month history of increasing scalp hair fall. On examination, there was marked scalp hair thinning with a margin of good hair remaining over sides and posterior scalp; the thinned area showed different lengths of stubble (fig 6). Her mother and a schoolteacher had noticed the child twisting her hair. The mother tended to push her at her studies and to direct her leisure activities, for

example no dolls. Her father was a more easy going individual and she had two brighter younger brothers. I arranged for the child to see both a paediatrician and a child psychiatrist in addition to myself. Full regrowth of hair occurred within nine months. Her mother never accepted that the hair loss was solely self inflicted.

CASE 2

A 5.5 year old boy came to clinic with a history of a patch of alopecia areata the previous year that had regrown within three months. One month after regrowth bifrontal hair loss occurred. The mother had noticed him pulling his hair and he admitted it to me also on careful questioning, and the scalp appearance was bizarre. There was a history of nail biting before the alopecia areata. It became clear that hair pulling usually occurred at school, regrowing during the holidays: he had learning difficulties at school and teacher problems. He was prescribed a bland cream to apply to the scalp and the hair regrew. The hair returned to normal over a 10 month period. However, once the hair had regrown he began biting his nails again and I told him to apply the scalp cream to the nails rather than bite them. The nail biting ceased rapidly when he became happier in school.

MANAGEMENT AND PROGNOSIS

Management depends on detecting the reason for hair pulling. If an isolated habit, behavioural management should help. If due to chronic social deprivation this has to be sorted out and improvement in the quality of child care at home and in the community must be a priority. If an anxiety state is present, family or individual psychotherapy may be helpful. Clomipramine (a serotonin reuptake blocking drug) may have a place in the severely affected older child with obsessive-compulsive disorder but advice should

be sought from a child psychiatrist. Some success has been claimed in the probably analogous conditions of compulsive feather picking in birds²⁰ and compulsive paw licking in dogs.²¹

In practice, prognosis in the young child is generally good but is more guarded in the adolescent female with marked hair loss.

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