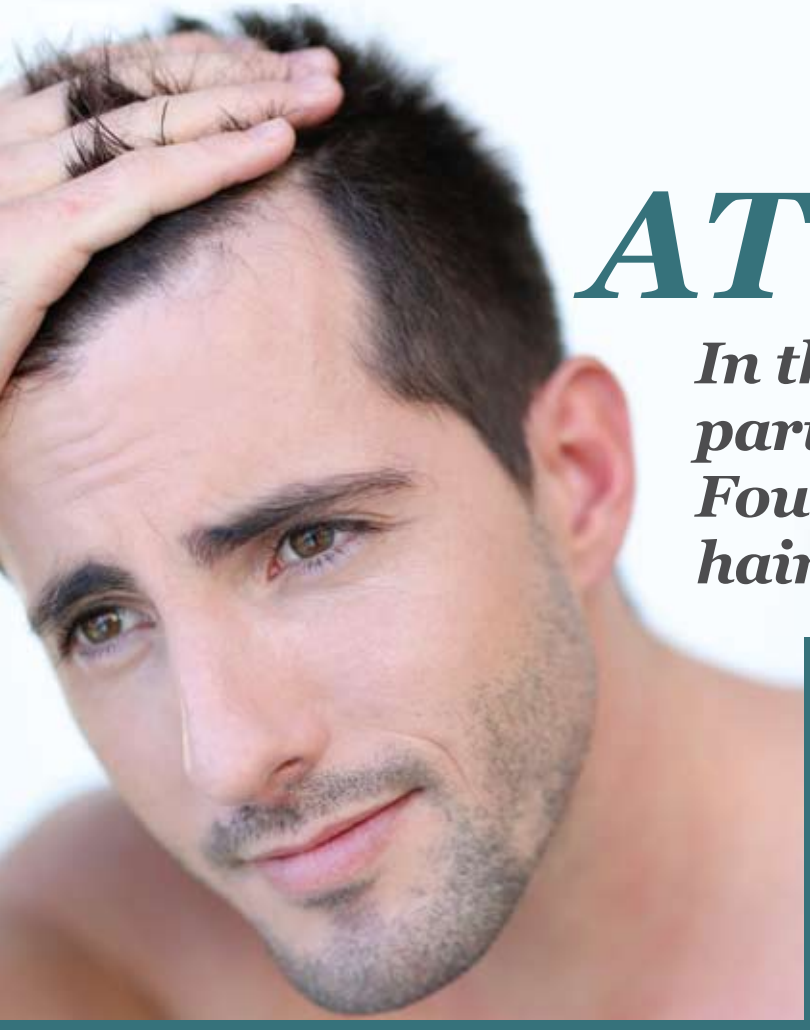

AT A LOSS?

In the first of a two part article, Dr Sotirios Foutsizoglou looks at hair loss treatments

Dr Sotirios Foutsizoglou is a member of the Royal College of Surgeons of England and performs hair transplant surgery in Harley Street, London. He is also a member of the International Society of Hair Restoration Surgery and the founder of SFMedica. He specialises in cosmetic surgery and aesthetic medicine with numerous publications in UK journals, magazines and newspapers. He is also one of the senior trainers in non-surgical procedureswithKT-TrainingMedicalAesthetics.

Hair loss can be a devastating problem for both men and women. Although genetically programmed hair loss or androgenetic alopecia cannot be classified as 'disease' or 'illness', doctors of all specialties should be able to recognise the negative impact it has on people's psychological well-being. People's concerns regarding their thinning scalp hair should never be disregarded or overlooked.

Hair loss is not just a male problem. It is estimated that one in five women will experience some degree of hair thinning. The psychological toll of hair loss is often underestimated. Studies have shown that hair loss can significantly impair quality of life by causing increased anxiety, depression and low self-esteem. Poor self-image and confidence, not infrequently encountered in hair loss sufferers, can profoundly affect how a person relates to others in their social and professional environment.

In advanced alopecia hair restoration surgery is the only effective and long lasting answer to the problem. In the past hair transplant had received bad press making people hold back from opting for a surgical solution to their balding appearance. Nowadays with advancements in technology and better understanding of the anatomy and pathophysiology of hair, hair restoration surgery has made huge strides and the results can be natural looking and permanent.

There are mainly two types of hair restoration techniques used for cosmetic improvement of the thinning scalp, the traditional strip surgery (FUT) and the follicle extraction technique or FUE.

Pathophysiology of hair loss

Human hair grows in tiny bundles called follicular units. There are several definitions of the follicular unit (FU) but most hair specialists agree that any grouping of hairs consisting of more than one terminal follicles, usually between one and five, along with a couple of vellus hairs, as well as the associated sebaceous glands and arrector pili muscle (Fig.1) can be termed a follicular unit. In terms of hair restoration surgery, it is generally accepted that a FU refers to a graft that has kept intact the natural cluster of hairs as seen on the surface of the scalp.

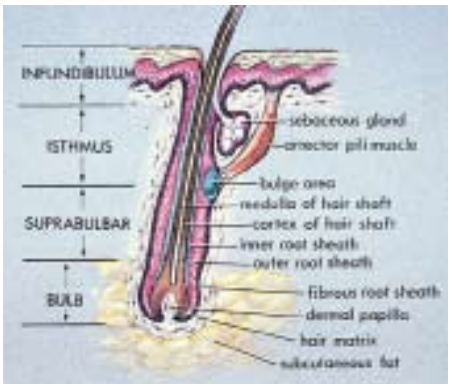

Fig.1. Hair Anatomy

FU density on the scalp averages between 70 to 120 FU/cm2. Variations in density and hair life span are found at different locations on the scalp and in different ethnic groups. For instance, even in a man with severe hair loss, he will still have a horseshoe pattern of permanent hair at the back of the head (i.e. occipital fringe) which can potentially become a donor area for a surgical redistribution of the existing hair. Only a very small percentage of men ever develop hair loss that is more severe than Type VI MPB (Fig.2).

Fig.2. Classification of Male Pattern Baldness (MPB)

Normal hair has a growing anagen phase of two to six years, an involutional catagen phase of two to three weeks, and a resting telogen phase of two to three months during which some hair is shed. In hair loss there is a progressively shortening anagen phase associated with hairs becoming shorter and finer until the affected follicles (or bulbs) produce no more hairs. This process is called hair miniaturisation whereby thick, pigmented terminal hairs are replaced by fine vellus hairs and eventually no hairs. In men, hair loss is more patterned, whereas in women it usually presents as diffuse thinning involving most of the scalp hairs.

However unpatterned hair loss can be seen in both men and women in cicatricial alopecias whereby hair follicle damage is associated with atrophy and scarring of the scalp skin. Acne, fungal infections, herpes simplex, inflammatory diseases such as lichen planopilaris, folliculitis decalvans and pseudopelade of Brocq are the most common causes of scarring alopecia. The mainstay of therapy is early intervention with a combination of antibiotics and intralesional steroid injections to prevent disease progression and permanent hair loss.

Men

The mode of inheritance of male pattern baldness is presently unclear, however, it is most likely polygenic with an androgen-dependent pathogenesis. The actions of androgens are regulated by the androgen receptor that modulates the transcription of androgen responsive genes thought to play a major role in the process of follicular miniaturisation and androgenetic alopecia. Recent work has suggested that frontal scalp of balding men has higher expression of androgen receptors compared to the occipital scalp. This is thought to be a major contributing factor to the site-specific miniaturisation seen in androgenetic alopecia.

The role of androgens in hair loss has been considered since the ancient Greeks when Hippocrates and Aristotle observed the absence of baldness in eunuchs. Although the influence of androgens in female pattern hair loss (FPHL) is not as pronounced as in male pattern hair loss (MPHL) it is worth mentioning that women with clinical hyperandrogenism often develop a pattern of hair loss similar to what is seen in men, with bitemporal recession and vertex thinning. Nowadays we know that a metabolite of testosterone, not the testosterone itself, 5α -dihydroxytestosterone (DHT) is the principal causative agent of hair loss in men. The tissue active androgen DHT shortens the anagen cycle from years of growth to months. The metabolism of testosterone to DHT is catalyzed by the enzyme 5α-reductase, which exists as two isoenzymes: Type I and Type II. Inhibitors of 5α-reductase such as Finasteride and Dutasteride, which are the most effective pharmacological treatments to date, target the type II and type I & II isoenzymes respectively.

Women

In women, there appears to be two main peaks of onset of hair loss: 3rd and 5th decades. Similarly to men, those women with an earlier onset tend to develop more severe degrees of hair loss.

Hair loss in women is often linked with ageing or menopause as falling levels of the female hormones oestrogen and progesterone allow testosterone – which is also produced by women to a lesser degree - to have a greater impact on the hair follicles.

A review of a female patient's medical background is of paramount importance, since comorbid medical conditions and a large number of medications can cause telogen effluvium and permanent hair loss.

In some cases, not routinely, appropriate laboratory investigations, microscopic evaluation of the hair shaft, and scalp biopsy may be indicated in order to establish a diagnosis.

Polycystic ovary syndrome (PCOS), hypothyroidism, iron deficiency, metabolic disorders such as diabetes, nutritional deficiencies (e.g. protein, zinc, magnesium, biotin), dermatological conditions such as alopecia areata, severe stress, neoplasm, radiation, and autoimmune diseases (e.g. discoid lupus) can all potentially cause alopecia in women.

Finally, non-medical causes of hair loss in women, include trichotillomania and direct trauma to the hair (e.g. perming, bleaching, straightening, etc).

Pharmacotherapy

Most of the drug treatments for FPHL and MPHL are not prescribable on the NHS. Doctors who are involved in hair loss treatments must be fully aware of the indications and contraindications of drug treatments along with the mechanism of action, side effects, limitations and expected results.

Minoxidil (Regaine) 2% is the only licensed drug for FPHL in the UK. It has been shown to increase the ratio of anagen to telogen hairs. However its exact mechanism is not clearly understood. Minoxidil 5% foam is recommended for MPHL. Minoxidil is usually stopped 2 or 3 days before surgery to reduce intraoperative bleeding due to vasodilation.

Finasteride (Propecia) 1mg daily, a type II isoenzyme inhibitor, is licensed for men only. However doctors with experience in the treatment of FPHL have used it in post-menopausal women with some degree of success.

Dutasteride inhibits both type I & II 5α -reductase isoenzymes. Evidence suggests that dutasteride is three times more effective than finasteride. Dutasteride can decrease serum DHT by more than 90% whereas finasteride reduces it by about 70%. Dutateride dose can vary between 0.5mg and 2.5mg daily or weekly but that needs to be discussed on an individual basis.

Anti-androgens (e.g. spironolactone, cyproterone) and oral contraceptives are used to suppress the ovarian androgen output in PCOS.

Ketoconazole, an imidazole antifungal, has anti-inflammatory properties and is associated with reduction of Malassezia colonization of the skin found in seborrheic dermatitis. It has also been implicated in the disruption of DHT pathway. Therefore 2% ketoconazole shampoo can be used in both men and women in conjunction with Finasteride and/or Minoxidil.

Finally I would also like to mention non-pharmacological treatments that I have used, with various degrees of success, in earlier stages of hair loss such mesotherapy and PRP. These treatments can also be combined with drug treatments and/or hair restoration surgery for better results.

Hair Mesotherapy is the practice of using a combination of hair follicle targeting specific microinjections of compounded homeopathic agents and plant extracts such as vitamins (e.g. Biotin), sulphur amino acids, essential minerals (e.g. Zinc), dexpanthenol (the biologically active form of panthenol), ginkgo biloba and organic silicon in order to cause an increase in blood circulation to the scalp and stimulate the follicles to produce better quality and thicker hair.

PRP therapy causes activated platelets to release growth factors. These growth factors promote bio cellular regeneration which in the case of hair loss is translated as prolongation of the anagen phase and follicular stimulation to produce better quality hairs.

Next month the article continues with hair transplant surgery.

References: Ref 1 – 'Harries MJ, Sun J. Management of alopecia areata. BMJ 2010; 341:209-258. Ref 2 – Patel M. And Sinclair R. Epigenetic modifications may explain the relative protection of occipital hair follicles from androgenetic alopecia in men. Hair Transplant Forum International. Vol. 4. July/August 2011. Ref 3 – Unger WP et al. Hair Transplantation. 5th Edition. Informa Healthcare 2011.