Androgenetic Alopecia: Combining Medical and Surgical Treatments

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BACKGROUND. Medical treatment or surgical reconstruction is used separately to treat androgenetic alopecia. Two drug molecules (5% minoxidil solution and oral finasteride 1 mg) have proven efficacy to stabilize hair loss and promote hair regrowth. Microtransplant of one to three hair follicular unit grafts can provide a definitive hair restoration with a natural appearance.

OBJECTIVES. Aesthetic results can be optimized with a combination of drugs and transplantation of follicular unit grafts. The Dynamic Multifactorial Classification is used to select suitable candidates for this combined approach and also to assess follow-up results.

RESULTS. Dynamic Multifactorial Classification assists the evaluation of the natural history of androgenetic alopecia evolution and also the effects of treatment. Regression of male androgenetic alopecia from Hamilton type V to type III can be achieved by combining drugs with hair grafts.

CONCLUSION. Improvement of investigative methods and especially the Dynamic Multifactorial Classification makes it easier for a patient to follow the results of treatment adapted to their case.

P. BOUHANNA, MD HAS INDICATED NO SIGNIFICANT INTEREST WITH COMMERCIAL SUPPORTERS.

Pathophysiology of Androgenetic Alopecia

Androgenetic alopecia is an androgen-induced hair-loss phenomenon in genetically predetermined individuals. It affects persons between 18 and 40 years and is of multigenic inheritance.

Male hormone dihydrotestosterone acts on androgenic receptors of hair follicles to activate genes responsible for the progressive transformation of terminal hairs into intermediate then vellus hairs.

This miniaturization process affecting hair length and hair diameter characterizes androgenetic alopecia. However, we should know that the number of hair follicles per unit area on bald scalp remains unchanged.

The androgenetic enzyme 5α-reductase converts the male hormone testosterone into a more potent one called dihydrotestosterone. The 5α-reductase enzyme is of two types (type I and type II) at the level of scalp.

Young men or women with androgenetic alopecia show levels of 5α-reductase and androgenic receptors and decreased cytochrome P450 aromatase more in the frontal bald area than in the normal occipital area. The permanent growth of implanted hairs is explained by the difference in receptors between the occipital area and the other remaining areas of scalp (Figure 1a,b). Male or female androgenetic alopecia can be classified according either to a static classification such as those of Hamilton and Ludwig or to a more precise one called Dynamic Multifactorial
Figure 1. (a) Levels of androgenetic enzymes on frontal and occipital region of male scalp (courtesy of Sawaya ME and Price VH). (b) Sketch of donor area in male.

Classification\(^7,8\) (Figure 2a,b). Therefore, it is common sense to integrate the multiple-hair parameters of every patient into a dynamic classification. These parameters include size of bald and hairy areas in relationship to fixed landmarks of the face, scalp laxity, and scalp thickness as well as hair coverage according to density, diameter or caliber, shape, length, growth rate, and color of hair. These data can be processed in order to characterize each patient alone. The goal of this multifactorial classification is to give a better understanding of male or female androgenetic alopecia evolution either spontaneously or under treatment.

Newest Medical Treatments

The goal of medical treatment for androgenetic alopecia is to increase hair coverage and to retard thinning. The use of oral finasteride at a dose of 1 mg/day\(^9\) and of 5% minoxidil solution\(^10,11\) has proven efficacy on male androgenetic alopecia. Two-percent minoxidil solution should be prescribed for female androgenetic alopecia and as a first choice treatment for males.

Trichogenous effect of these drug molecules varies according to single individuals. Good candidates to this therapy are those who have a great amount of miniaturized hairs. For patients who respond well to 5% minoxidil solution, hair loss stabilization occurs around the 3rd or 4th week after all telogen hairs have fallen out. Hair regrowth occurs after 2nd or 3rd month of treatment. Finasteride potentiates both stabilizing and hair regrowth effects induced by minoxidil.

Hair coverage generally occurs after 6 to 12 months of treatment. Benefit obtained can be maintained if treatment is continued. If treatment is interrupted, thinning process starts back in 6 to 12 months. No effect can be expected on completely bald areas.

Specificity of Female Treatments

In moderate androgenetic alopecia, minoxidil 2% solution and certain types of antiandrogens can be prescribed either alone or in association. Finasteride is contraindicated in women.\(^12,13\)

In severe androgenetic alopecia, the same medical treatments can be prescribed as mentioned previously
here, except in very severe cases, where they have very little effect.

Most of the time, the choice of therapy will be guided by the patient's own esthetic wish going from the covering ability of a hair prosthetic or of masking products to the definitive solution given by minimicrografts transplantation.

**Newest Micrografting Techniques**

Minimicrografts or follicular units transplantation has greatly improved over the past decade and is widely used by the entire international hair societies.

Advances in minimicrografts techniques have been specially obtained via the following:

1. Preoperative physical examination with the determination of scalp parameters and of possible contraindications
2. Local anesthesia with topical anesthetizing cream and nerve block (this rendered hair transplant quite painless)
3. Minimicrograft harvesting from occipital donor area (a fine linear, horizontal, and almost invisible scar is obtained after closure with sutures or staples)
4. The minute preparation of minimicrografts and of one to three hair follicular units under stereomicroscope (this fine graft cut contributes to avoiding the unaesthetic "doll's hair appearance") (Figure 3a, b)
5. The fine implantation of micrografts on bald areas with microsurgical needles and forceps (this is obtained through the adequate choice of hair emergence, hair orientation, and angling, especially in the anterior frontal line and the crown hair whirl)

**Figure 3.** (a) Micrografts cut under stereomicroscope. (b) Micrograft aspect before implantation.

**Figure 4.** (a) Anterior frontal line reconstruction with micrografts and persistence of few intermediate hairs. (b) Reconstruction of anterior frontal line with micrografts alone.
6. The fine and irregular reconstruction of the anterior frontal line with one hair grafts (Figure 4a,b)
7. The high amount of approximately 1000 to 3000 transplanted hairs in one session, performed by a well-trained team of three to five assistants
8. A homogeneous distribution of minimicrografts and of follicular units on large bald areas
9. Good postoperative results (superficial implantation of minimicrografts gives a rapid and painless wound-healing process and patient resumes work 24 to 48 hours later)
10. Implanted hairs that will fall out around day 15 to grow again between month 2 to 4.

How do you optimize quality of results treatment?

1. A surgeon must select candidates with respect to their psychological profile and surgical limitations and in accordance with their aesthetic wishes, particularly for young men or women under the age of 30.
2. A surgeon must warn patients less than 30 years old about the possible evolution of androgenetic alopecia.
3. A surgeon must know how to combine minimicrografts with local 5% minoxidil solution and oral finasteride 1 mg for men or local application of 2% minoxidil alone, in order (Figure 5a,b) to slow down the evolutive thinning process, to stop probable loss of preexisting hairs in between grafts, to decrease the transient hair loss of grafted hairs that may occur at day 15, to increase regrowth of grafted hairs and of preexisting hairs that may have transiently fallen out after surgery.
4. A surgeon must provide a good quality control of minimicrografts cleansing with an antiseptic shampoo during the 8 days after surgery.
5. A surgeon must adapt instruments and transplant techniques to the individual scalp and hair according to ethnic background (Blacks, Asians, etc.) and to women (Figure 6a,b).

![Figure 5](image1)

![Figure 6](image2)

**Figure 5.** (a and b) Male androgenetic alopecia treated with combination of Minoxidil 5%, Finasteride, and one session of micrografts.

**Figure 6.** (a and b) Female androgenetic alopecia treated with one session of minimicrografts and Minoxidil 2%.
We should point out that all attempts made so far with automatic implanters or with laser implantation have not shown better results than with conventional hair transplant technique.

**Conclusion**

It is henceforth possible to raise efficient medical treatment and surgical therapy with definitive and natural aesthetic results. Evaluation of different hair and scalp parameters helps to establish a patient's profile and a long- and short-term plan of treatment.

Nowadays, patients can be fully informed about the most suitable treatment adapted to them. Therefore, they will be able to follow more effectively the positive effects given by their own individual treatment.

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**References**