

Long Hair Grafts: 20 Years of Experience

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Twenty years ago, we set out the technique of long hair grafting based on a logical approach supported by repetitive observations and the discovery of new surgical techniques. This technique was developed in combination with the use of peri-operative use of minoxidil.

A study was conducted on 16 male subjects aged between 25 and 52, displaying a male androgenetic alopecia, type III–VI, according to Hamilton's classification. These patients were candidates for a 4mm in diameter cylindrical autograft transplantation and applied 1 ml of 2% minoxidil solution twice a day, one month before and three months after the surgery. This hair counts technique, using the phototrichogram I published, allowed me to do a practical approach and an objective follow-up of hair graft evolution whether spontaneously or after the application of minoxidil 2% solution.

This treatment was momentarily interrupted over a 3-week period following the hair transplant surgery.

Typically, scabs fell off between 2–4 weeks after the surgery, along with shafts of the grafted hairs being of a dystrophic, anagen type instead of a telogen type, as was previously mentioned in the literature. This hair loss, although transitory and followed by a regrowth within 3 months, was aesthetically embarrassing. A macrophotographic control of 64 grafts, taken in a group of 4 from each patient and marked with a tattoo, was done over 3 months. It showed a continuous growth of part of or the whole hair graft 4 weeks after transplantation for 71% of the patients. Moreover, hair loss was less than 50% for 31% of the grafts. This study suggests that minoxidil treatment helps to maintain the transplanted hairs in the anagen stage.

In 1986, our intent was to take advantage of minoxidil's efficiency on grafts in order to set up a technique using long hair grafts. A 2% minoxidil lotion is applied over the grafts as mentioned above. A strip of scalp containing long hairs was carefully harvested from the occipital donor area and was then cut into different size segments, some not larger than 1- to 2-haired micrografts or 3- to 4-haired minigrafts, others measuring up to 4mm wide. We called this procedure "long hair grafting" and believed it had numerous benefits. Even if the persistent growth of hair grafted in conjunction with the application of minoxidil did not always succeed, it nevertheless helped the patient to momentarily hide for 3 weeks the scabs formed over the grafts.

The 2% topical minoxidil solution applied before and after surgery helped to avoid, in most of the cases, the post-operative hair effluvium. Combining this local treatment and grafts with long hairs, we were able to develop a methodology to achieve an immediate reconstruction of baldness.

In 1993, the long hair graft technique was described and fully detailed in the chapter "Newer techniques in hair replacement," in Roenigk's textbook *Surgical Dermatology* (Dunitz, ed., pp. 527–533). It is also described in my book "Hair Replacement Surgery," (Springer Verlag, eds., 1996; pp. 106–114).

Today, the present technique of long hair grafts consists

of obtaining a strip of scalp with long hairs, whose length varies from 10–25cm according to the numbers of needed grafts (Figure 1), that is harvested on the occipital donor area, which will be closed with sutures or staples. The strip is then thoroughly cut into 1–3 long hair micrografts or long hair follicular units grafts under a stereomicroscope to preserve the integrity of the harvested hairs (Figures 2 and 3).



Figure 1. Strip of scalp is first obtained with long hairs.

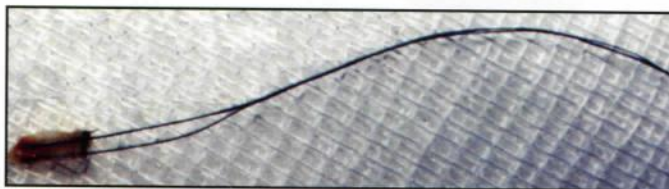


Figure 2. Strip is cut into 1–3 long hair micrografts or long hair FUGs.

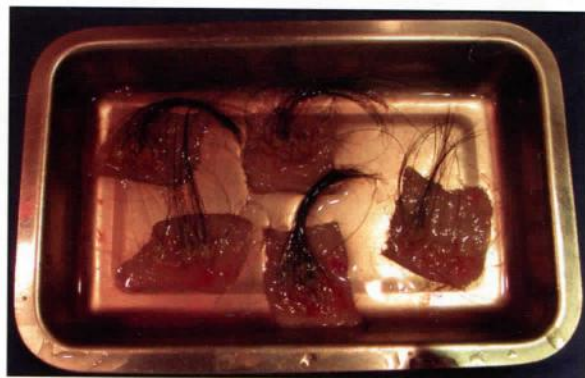


Figure 3. Long hair grafts are placed on moistened pads prior to placement.

The long hair graft technique achieves an aesthetic natural look of hairs due to:

1. A fine implantation on the balding area with surgical needles and jewelers forceps allowing the good choice of hair emergence angle, hair orientation, and obliquity.
2. The performance of a fine and irregular "one-by-one" frontal hairline.
3. A good implantation of 2,000–3,000 hairs in each session.
4. A homogeneous distribution of many more micrografts and follicular units grafts.

Indications for Long Hair Micrografts

- In male androgenetic alopecia (MAGA): In MAGA, hair thinning appears to follow and evolve according to a particular pattern.

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Improving the Revascularization

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Conclusion

It is well known that the up regulation of VEGF and FGF-7 via cAMP signalling, and the up-regulation of specific amino acids receptors in DPC and ORS can stimulate perifollicular vessel permeability, the anagen phase, the hair follicle growth rate, and hair follicle diameter.

Furthermore, we think that a post-operative topical treatment that can stimulate the up-regulation of VEGF, FGF-7, ornithine, and taurine receptors in ORS after a hair transplant can improve surgical results, reducing ischemia reperfusion injury, increasing the rate of hair growth, and stimulating anagen phase in transplanted hair. ♦

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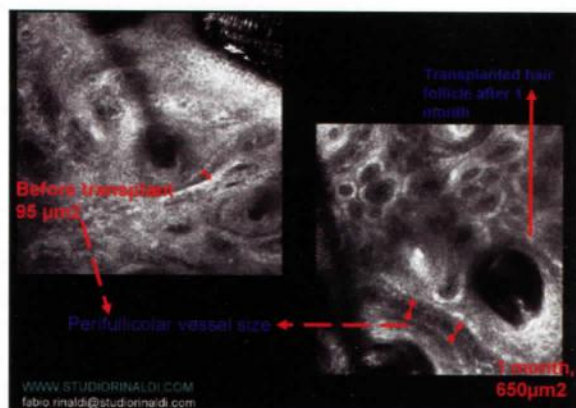


Figure 5. The diameter of perifollicular vessels is significantly bigger 1 month after the hair transplant in the 1-3-Atodine group ($650 \mu\text{m}^2$) versus placebo group ($95 \mu\text{m}^2$). The diameter of the hair follicle is bigger, too.

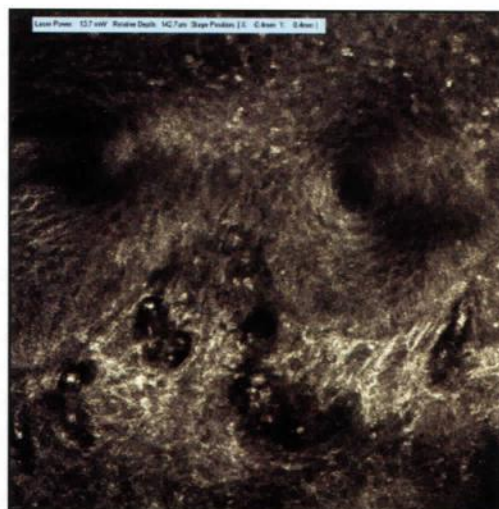


Figure 6. Perifollicular capillary loops after up regulation of VEGF: The white spots inside the vessels are circulating red blood cells.

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