Hair transplantation

By Rahul Nanda, MD, and Thusanth Thuraisingam, MD, PhD, FAAD

Hair transplant – Basic concepts

1. The **theory of donor dominance:** Transplanted hairs will maintain the properties of where they were harvested (therefore, areas that are relatively resistant to androgen-mediated miniaturization, such as the occipital and temporal scalp, are preferred).

2. In hair transplantation, there is no net increase in the number of new hairs. Instead, there is a **redistribution** of the **pre-existing hairs from the patient's donor site to the recipient zone.**

3. The follicular unit is the main structure used for hair transplantation. It is composed of an average 2.5-3 terminal follicles* and associated adnexal/supportive tissue.

4. The **bulge** (located at the insertion of arrector papilla muscle) and the **dermal papillae** (located at the inferior portion of follicle) are the two main units involved in hair regeneration; recognizing their location is imperative to preserve integrity.

*Variable based on race, scalp zone, and patient characteristics

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Alopecia – Suitability for hair transplantation

Suitable conditions	Not suitable conditions
Male and female pattern hair loss (androgenetic alopecia)**	Primary scarring alopecias (lichen planopilaris, frontal fibrosing alopecia, folliculitis decalvans, discoid lupus)
End stage of primary scarring alopecia***	Alopecia areata
Secondary scarring alopecia (burns, radiotherapy, morphea, post-surgery)	Active trichotillomania
Advancement of frontal hairline in congenital hairlines and traction alopecia	Telogen effluvium
Eyebrow hair loss (plucking, trauma, post-surgery)	Unreasonable expectations/ body dysmorphic disorder
Eyelash, beard, pubic hair loss	Active infection of the scalp
Temporal triangular alopecia	Young adults (<25 years of age with androgenetic alopecia)****

** Less suitable for cases of diffuse unpatterned androgenetic alopecia or if rapidly progressive.

*** There must be no active inflammation for at least 1-2 years. Patient must be aware of the risk of potential reactivation of the scarring alopecia and loss of the transplanted hairs.

**** Young patients may not fully understand progressive nature of alopecia and the need for future sessions. Hair loss stabilization with medical treatment prior to transplantation is advised in these patients.

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Techniques for harvesting follicular grafts

	Follicular unit extraction	Strip excision
Prevalence of technique	Most commonly used technique (considered 'less invasive')	Less commonly used
Method	Punch removal of follicular units using manual, motorized, or robotic tools (micropunch)	Obtained through the microscopic dissection of a strip excised from the donor scalp, then grafts divided from the strip
Time required for harvest	Longer surgical time	Shorter surgical time
Demands on the surgeon	Long learning curve, physical stamina, higher than average hand-eye coordination and manual dexterity	Shorter learning curve in an physician with relatively good surgical skills
Harvest site	Can use both scalp or non-scalp hair (i.e., beard, torso) as donor	Uses posterior scalp hair as donor
Scarring	Less visible scarring	Linear scar at posterior scalp (more visible if hair cut short)
Healing time	Quicker healing time	Longer healing time

Complications

- Inherent to surgery: Edema of the forehead postoperatively (resolves within 1-2 weeks), folliculitis, pruritus, ingrown hairs, cyst formation, numbness/paresthesia (usually resolves within a few weeks), telogen effluvium (2-3 weeks post-surgery, self-limited), hypertrophic scar and keloids (especially in patients of African, Asian, or Latin American descent).
- Common (due to poor technique): Poor growth*****, unnatural look of hair (distribution, hairline design, angle of growth), donor depletion.
- Rare: Infection, necrosis, keloids (in donor area), lidocaine toxicity, traumatic AV fistula, permanent paresthesia, or dysesthesia.

*****Poor growth can happen for various reasons including excessive hair graft transection, graft dehydration, improper graft handling in the implantation process, and excessive trauma at the recipient site.

References

1. Alikhan, A., & H., H. T. L. (2017). *Review of dermatology.* Elsevier, Inc.
2. Donovan, Dr. J. (2020, July 16). *Contraindications to hair transplantation: When is hair transplant surgery not an option?* Donovan Hair Clinic. https://donovanmedical.com/hair-blog/contraindications-to-hair-transplantation
3. Jimenez, Francisco, et al. "CME Article Part I: Hair Transplantation: Basic Overview." Journal of the American Academy of Dermatology, vol. 85, no. 4, 2021, pp. 803–814, https://doi.org/10.1016/j.jaad.2021.03.124.
4. Jimenez, Francisco, James E. Vogel, et al. "CME Article Part II. Hair Transplantation: Surgical Technique." *Journal of the American Academy of Dermatology*, vol. 85, no. 4, 2021, pp. 818–829, https://doi.org/10.1016/j.jaad.2021.04.063.
5. True, Robert H. "Is Every Patient of Hair Loss a Candidate for Hair Transplant?-Deciding Surgical Candidacy in Pattern Hair Loss." *Indian Journal of Plastic Surgery: Official Publication of the Association of Plastic Surgeons of India*, 20 Dec. 2021, www.ncbi.nlm.nih.gov/pmc/articles/PMC8719975/.

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