Management of Alopecia
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• The average scalp contains 90000-140000 terminal coarse, medullated & pigmented hairs and many more vellus and indeterminate fine hypopigmented unmedullated hairs.

• At any time approximately 90% of terminal hairs are in the anagen (growing phase) lasting around 1000 days up to 7 yrs and the rest is in the catagen (regression) phase lasting typically 2-3 weeks ending the formation of a club hair which is shed in the third phase telogen (resting) phase lasting 3-4 months.

• The shedding of around 100 hairs daily is normal
Anagen: Active Growth Phase
2-6 Years

Catagen: Transition Phase
1-2 Weeks

Telogen: Resting Phase
5-6 Weeks

Return to Anagen

Dermal Papilla Separated from Follicle

Hair Matrix Forming New Hair
Causes of Alopecia

Non Cicatricial Alopecia
- Androgenic Alopecia
- Cicatricial Alopecia
  - Alopecia Areata (or Totalis)
  - Telogen effluvium
  - Hair Abuse: Traction Alopecia, Chemicals & Heat
  - Trichotillomania (Trichotillosis)
- Medical Causes
  - Drugs & Irradiation
  - Hypervitaminosis A

Cicatricial Alopecia

Secondary Burns, Trauma, Scalp Infections

Primary

With Lymphocytic Infiltration
Lichen planopilaris, Frontal fibrosing alopecia, Central centrifugal alopecia & Pseudopelade (Brocq)

With Neutrophilic Infiltration
Folliculitis decalvans, Tufted folliculitis & Dissecting cellulitis

With Mixed Infiltration
Folliculitis keloidalis
Management of Cicatricial Alopecia

**Random Flaps**
- Rotational Flaps
- Transposition Flaps
- Bipedicled Flaps
- Expanded Flaps (BAT & TAT Flaps)

**Axial Flaps**
- Juri Flap

**Scalp reduction & Scalp lifting procedure**

**Scalp Extension**

**Tissue Expanders**
- BAT & TAT Flaps

**Free Flaps**

**Hair Transplantation**
Scalp Extension

Alopecia Reduction

Alopecia Reduction With Expansion

Scalp Lift

Scalp Flaps
Androgenetic alopecia remains the main cause of male pattern baldness (MPB) & female pattern baldness (FPB).

Both types of alopecia are caused by dihydrotestosterone (DHT) which is the metabolite of testosterone produced by 5-a reductase enzyme. DHT acts on androgen binding receptors on the genetically susceptible hair follicles.

Although the genetic basis of androgenetic baldness is confirmed, the relatively strong concordance of the degree of baldness in fathers and sons is not consistent with simple Mendelian trait and a polygenic basis is therefore most likely.
Norwood’s Classification of Male Pattern Alopecia
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Norwood's Classification of Male Pattern Alopecia

I
II
IIa
III
IIIa
IIIvertex
IV
IVA
V
VI
VII
Va
Diffuse Alopecia
Patterned (DPA) & Un-patterned (DUPA)
Ludwig’s Classification of FPB
Management

• **Hormonal**
  - Finasteride *(Propecia, Proscar)*
  - Spironolactone

• **Topical +/- Scalp Roller**
  - Minoxidil *(Rogaine & Performa)*
  - Propecia??
  - Caffeine *(Alpecin)*
  - Combinations

• **Mesotherapy +/- Scalp Roller**
  - Biotin, Pyridoxine, Azelaic Acid, Zinc, D-Panthenol & Ginkgo Biloba *(Keractive / MesoActive / Hairactive / Andropecia)*
  - 5AR inhibitors Dutasteride / Finasteride *(Mesohair / Mesopecia)*
  - Minoxidil *(MesoAge)*
  - **STEM CELLS??**

• **Hopeful Research**
  - **Hair Cloning:** Stem Cell organ replacement
  - WNT protein, Grateloupia elliptica, Prostaglandin D2, L-Carnitine-Tartrate

• **Surgery**
Mesotherapy for Hair Loss

- **Minoxidil**: Vasodilator that lengthens the Anagen phase by increasing Blood supply to the follicles
- **Dutasteride or Finasteride**: 5-AR inhibitor
- **Azelaic Acid**: 5-AR inhibitor
- **Zinc**: 5-AR inhibitor
- **Pyridoxine**: Vit B6 which potentates Zinc inhibitory Effect
- **D-Panthenol**: Vit B5 increases energy production in the follicles
- **Biotin**: Vit B7 or Vit H increases production of Fatty acids
- **Ginkgo Biloba**: Increases blood supply to follicles
Mesotherapy for Hair Loss

Biotin, Pyridoxine, Azelaic Acid, Zinc, D-Panthenol & Ginkgo Biloba *(Keractive / MesoActive / Hairactive / Andropecia)*

+/-

5AR inhibitors Dutasteride / Finasteride *(Mesohair / Mesopecia)*

Minoxidil *(MesoAge)*
Scalp Roller

- Creates tiny channels through stratum corneum which facilitate the passage and absorption of Minoxidil into the dermis to maximize its absorption by the hair follicles.
- Stimulates blood flow to the hair follicles via direct scalp massage.
- Gently exfoliate excess skin cells which accumulate in the hair follicles, contributing to hair follicle malnutrition.
Surgical Treatment

1-HAIR TRANSPLANTATION

2-Alopecia *(Scalp)* Reduction (AR)
- Simple AR
- Major AR *(Scalp Lifting)*
- *With* Prior Scalp Expansion
- *With* Prior Scalp Extension
- *With* Intraoperative Stretching

3-Scalp Flaps
- Rotational
- Transposition
- TPO Juri Flap
- Others
Scalp Extension

Alopecia Reduction

Alopecia Reduction With Expansion

Scalp Lift

Scalp Flaps
Surgical Treatment

HAIR TRANSPLANTATION

Natural Hair

- Follicular Unit Transfer (FUT)
- Follicular Unit Extraction (FUE)

Artificial Hair *BIOFIBRE*
Surgical Treatment

Safe Donor Area (SDA)

- SDA is on the average 25% of Scalp area. Half of it can be harvested without affecting the appearance of donor area so 12.5% of scalp is harvestable.
- 2-3 cm should be left below superior border to cover resulting scar.
- 2-3 cm should be left above posterior hair line.

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Surgical Treatment

HAIR TRANSPLANTATION

- Density
- Coverage
- Angle Control
- Naturalness
Follicular Unit Transfer (FUT)
Follicular Unit Transfer (FUT)
Follicular Unit Transfer (FUT)

Patient selection

• Age
• Expectations
• Chronic Sun Exposure
• Medical Conditions: DM, Bleeding Tendencies, HIV & Hepatitis C, Anticoagulant treatment, Arrhythmias
• Psychological Factors & Diseases

&

Patient Assessment

• Donor Area Assessment
• Recipient Area demand
• Size of Strip Needed
Follicular Unit Transfer (FUT)

Donor Area Assessment

Alopecia Assessment: Diffuse Patterned Alopecia *DPA* & Diffuse Un-Patterned Alopecia *DUPA*

Hair Characteristics: Colour, Texture, Curliness & Hair/Scalp Contrast

Scalp Assessment: Laxity & Thickness

Donor Reserves: Previous FUT &/or Scalp Scarring

Donor Density
Follicular Unit Transfer (FUT)

Donor Density Assessment

**Hair Density**: Number of hairs/mm²

**Follicular Unit Density (FUD)**: Number of Follicular Units/mm²

**Calculated Density**: Number of hairs/Follicular Unit

Density measured in 3 *Reference Points*: Occipital Protuberance, 3 cm above Helix and a point half way between both

The Rassman Hair Densitometer  Micro-VID Digital Hand Held Microscope
Follicular Unit Transfer (FUT)

Recipient Area Demand

Balance present and future needs with present and future donor availability

Farjo calculates recipient area size by dividing it into geometrical shapes

• Hairline design (Shape & Position)
• Graft Distribution
Follicular Unit Transfer (FUT)

Stop Smoking for at least a week

Stop any medication that enhances bleeding

If scalp is tight or patient had a prior session, he can do scalp relaxing exercises

Position 1 - palms in back of scalp with thumbs overlapping

Position 2 - palms on sides of scalp with thumbs touching in the back

Position 3 - palms and thumbs on the sides of the scalp
Harvesting a Longitudinal Strip from The Scalp

From Mid-part of the permanent zone

The strip should be Just above the occipital protuberance:

A lower harvest has a greater risk of scarring from the wound stretching, since it is too close to the muscles of the neck.

With a higher harvest, the hair may not be permanent and may fall out as the baldness progresses.
Harvesting a Longitudinal Strip from The Scalp

Tumescent Technique
Double-bladed or Multi-bladed Knife
Dissection should include a layer of fat below hair follicles
Closure by Staplers or a running suture

Trichophytic Closure
Harvesting a Longitudinal Strip from The Scalp

Trichophytic Closure

Step 1 - Excise Donor

Step 2 - Trim upper border

Step 2 - Photo of trimming upper border

Step 3 - Suture with upper hairs directed through lower edge
Graft Dissection

- Vertical Sectioning
- Mini/Micrografting Technique
- Slivering Technique
Single Hair Follicular Units - used primarily for the hairline area to create a softer more natural appearance. (14%)

Single Follicular Units - Usually consists of 2-3 hairs. Used right behind the hairline to create a more dense appearance. (53%)

Modified Follicular Units - Usually consists of about 3-4 hairs and are primarily for adding density to the recipient area. (33%)
Grafts are cooled and perfused with saline
Graft Insertion

Vertical or Lateral Slit Technique??
Stick & place or pre-made incisions
Graft Insertion

Lateral (Coronal or Horizontal) slit technique

Follows normal follicle arrangement and allows fanning of hair
More Control on Angle & Depth
More Superficial Slit = Less trauma to Scalp vascularity
Less Mutual Pressure Allows for More Dense Packing
Graft Insertion

Choi Needle
Follicular Unit Extraction (FUE)

NO SCAR IN DONNOR AREA

FOX test

Sharp Punch

• Fox technique
• FIT Technique

Safe System (Blunt Punch)

• Sharp Scoring incision by a sharp punch then Blunt punch
• Single Serrated dull punch
• Powered Safe System (Blunt Punch)

Robotic FUE (ARTAS system)
Follicular Unit Extraction (FUE)
Follicular Unit Extraction (FUE)

FUT is still the golden standard for hair restoration

Better Graft Yield
- Minimal division of hair follicles
- Proper dissection of a layer of fat around the follicles
- Rapid Harvesting allows a larger graft number

Better Graft Take
- Better Graft Quality
- Rapid Harvesting allows Faster Graft Insertion

More Permanent result
- Allows maximum utilization of mid-permanent zone donor Area

Better Donor area scar concealment with multiple sessions
- No additive scarring with subsequent sessions
- Donor scar remains hidden whatever the degree of baldness reached

Less Expensive

Mega-sessions need limited preoperative Hair trimming
Follicular Unit Extraction (FUE)

Unlike FUE, FUT is restricted to the safe mid-permanent Zone.
Follicular Unit Extraction (FUE)

Who is Candidate for FUE?

Patient who wants to cut hair very short
Athletes and muscular patients
Patients who needs to return to work next day

Very Tight or Very Loose Scalp
Previous FUT sessions
To conceal the scar of previous surgeries

To refine hairline

Body Hair Transfer
Follicular Unit Extraction (FUE)

ROBOTIC FUE (ARTAS System)
Follicular Unit Extraction (FUE)

ROBOTIC FUE (ARTAS System)
The Post-Operative Period

- 1 day Bandage
- Gentle shampooing from the next day
- Refrain from strenuous activity for a week
- Avoid Prolonged exposure to sun
- Stop smoking for at least a week
- Careful combing of hair
- Wait for crusts to fall out

Grafted hair is likely to be shed off
Grafted hair will enter into a resting phase
Hair will start to grow within 3-6 Months

Minoxidil and/or Propecia
THANK YOU