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The role of Scalp micro-pigmentation treatment in Follicular Unit Transplantation

Dr Sotirios Foutsizoglou and Anouska Cassano explain how micro-pigmentation can be used as a complementary treatment to hair restoration

Although the first hair restoration procedures of intact hair follicles were described by Japanese physicians Okuda and Tamura in the 1930s, modern hair grafting can be divided into three major periods.[1]

- The plug era
- A transition period of progressively smaller unit minigrafting and micrografting
- A final period of follicular unit transplantation (FUT)

Many hair transplant surgeons participated in the process of the reduction of graft size to minigrafts, culminating in large sessions of the use of very small minigrafts. The last and current stage of FUT, utilising the natural growth pattern of human scalp hair, was initiated in 1988 by Dr Bobby Limmer and the methodology of strip donor harvest, microscopic dissection of individual units of one to four hairs, and implantation of these grafts into needle tunnel recipient sites was reported in 1994[2]. Today, FUT constitutes the primary method of hair restoration technique performed worldwide.

Strip Method, or FUT, is the hair transplant technique whereby the surgeon applies local anaesthetic to the donor area s/he wants to take the hair from, usually the occipital 'permanent' zone. A thin strip of hair-bearing skin is then removed, which is subsequently slivered under the microscope into follicular grafts. These follicular unit grafts are then placed into pinprick incisions in the recipient area.

Strip Method: A) during donor strip harvesting and B) immediately after a two-layer closure of the resulting scalp defect

DEALING WITH THE AESTHETIC COMPLICATIONS ASSOCIATED WITH FUT

Visible scarring in the donor area (usually the parieto-occipital fringe or 'permanent area') is the most common patient complication encountered in hair transplantation using the FUT technique[3]. Visibility is predominantly influenced by the width of scar, the number of scars and the follicular density of the donor area; a large scar might be easily hidden within the middle of the dense donor area, whereas even a fine one might be obvious in sparse hair at the periphery of the donor region. Whilst prevention (Table 1) is the key to limiting scar visibility, a range of corrective measures are available to treat unsightly scarring. If there are multiple scars, one way to improve the appearance is by simultaneously excising two closely spaced scars, thus converting them into a single scar. A different option is to surgically revise individual scars that are atypically wide. Implicit in this approach is the belief that a meticulous surgical technique, with a focus on reducing wound tension, will result in a finer scar. Interestingly, botulinum toxin has also been used to decrease scarring by reducing the wound tension created from multiple muscular vectors[4].

TABLE 1.
KEY POINTS TO OBTAIN MINIMAL DONOR SCARS

- Close the wound with minimal tension
- A long and narrow strip usually heals much better than a short and wide strip
- Try to preserve as many blood vessels and nerves as possible
- Choose a slightly higher donor zone within the 'permanent' donor rim, rather than one near the nape of the neck.
- Use two-layered closure in strips wider than 1cm, in scalps with minimal laxity, in repeat excisions, and in patients with hyperelasticity of the scalp
- Wide strips (>1.2cm) should only be made by experienced surgeons
- In subsequent procedures when the former scar is removed, the width of the donor strip should usually be slightly reduced to prevent widening of the new scar
- Use trichophytic closure

If wide scarring persists despite the above measures, then an entirely different approach is to place follicular units within the scar. These can be obtained from strip excision, or from scalp or body FUE. A final option, if the aforementioned fails too, or if the patient is unwilling to go through another procedure, is to tattoo the skin to match the colour of the hair.

SCALP MICRO-PIGMENTATION

Scalp micro-pigmentation, or scalp tattooing, is a semi-permanent micro-pigmenting technique that offers an alternative option for both men and women suffering from hair loss, who are not appropriate candidates for hair transplant surgery or who do not want it. However, scalp micro-pigmentation is increasingly being used as a complementary treatment to hair restoration surgery, either to add the illusion of additional density and enhance the overall result of the

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patient's surgical procedure, or to camouflage existing scarring from older transplant surgeries where the patient has declined the option of a scar revision procedure.

One specific technique, Hair microPigmentation Treatment (HPT), involves the use of a digitally controlled needle that applies medical grade hypoallergenic colour pigment into the scalp. Unlike a traditional tattoo that would use ink, HPT is performed using specially designed pigments that will not have the colour change or migration that is commonly seen with a body art tattoo. The pigments used for HPT are of a pharmaceutical quality and fulfil the most demanding quality and security regulations, complying with category 1 of EU Cosmetics Directive and European Directive ResAp 2008[1]. The pigments are dermatologically and microbiologically tested and contain high quality mineral pigments. Additionally, they are sterile, hypoallergenic and do not contain any kind of artificial preservatives, aromatic amines or heavy metals.

Although it may appear to be a similar technique to body art tattooing, tattoo inks are not subject to the same stringent testing and regulations as the pigments used in HPT. In addition tattoo needles and treatment depth into the skin are very different. Both techniques use needles to implant colour, but that is where the similarity ends. Traditional body art tattoos have the tendency to change colour. If it was black to start with, very often they will turn blue as a result of migration due to the type of ink used and the tissue level at which the tattoo was implanted. HPT is not implanted at a deep level on the scalp; the simulated hair follicles are implanted in the very top layers of the epidermis.

For general scalp micro-pigmentation treatments, we would expect HPT to last between one and three years. After this, the patient will require some minor maintenance or touch ups to ensure their treatment is kept looking its best. However, it is impossible to predict the exact length of time the treatment will last, as each patient's biology is different and lifestyle choices and other variables can affect the longevity of the treatment. The pigments used for HPT are designed to fade over time. This makes it possible to adjust the tone and colour of the implanted 'hair follicles' and change the hairline, if applicable, to be more 'age appropriate' for patients as they mature. HPT is a multi-treatment procedure that usually requires two to three sessions to complete. Depending on the size of the area to be treated and the extent of a patient's hair loss or scarring, each session will take two to four hours. The treatment in itself is not painful, as the pigment is implanted only in the epidermis. However, no longer than four-hour sessions are recommended as there is a residual build up of 'irritation' that can eventually make the patient's scalp feel sore. We have used HPT effectively to help a number of patients camouflage their transplant scarring, which is either strip scarring, or hole punch or plug marks left after older hair transplant surgery techniques. For successful scar camouflage procedures it is important to understand how to assess the scar. The first step is to examine the scar and decide whether micro-pigmentation is suitable, or if another treatment such as excision or laser is more appropriate. It is of paramount importance to understand the different types of scars and how they have been created in order to decide the best HPT technique to treat them.Depending on the age or severity of the scar(s) we may need to improve the texture and flatten these scars with micro-needling, mesotherapy or PRP prior to referring the patient to a micro-pigmentation specialist. HPT is only appropriate for the treatment of scars that are more than a year old and are fully healed. Hypertrophic scars present as raised scars within the border of the trauma or incision. Hypertrophic scarring will almost always need a medical treatment prior to HPT. Keloid scarring presents as raised scar tissue outside the border of the trauma site or incision and is a contraindication to HPT as there is a high risk of precipitating further scarring[5].

The aim of re-pigmenting a scar is to blend in the damaged skin and reduce the contrast between the scar and the healthy scalp and surrounding hair. However, as highlighted previously, scars by their very nature are unpredictable to work on. Unlike healthy undamaged skin, the scar area may grab the pigment resulting in possible migration or occasionally it may reject the pigment and push the colour out.

SUMMARY

Many of the aesthetic and medical complications in hair restoration surgery are preventable through conservative planning and careful surgical technique. However in the relatively short list of potential aesthetic complications following a FUT procedure, scar widening or unsightly scarring in the donor site is the most frequently encountered complication even in the hands of the best hair transplant surgeon.

HPT has been added to our armamentarium to help us achieve a satisfactory outcome when all the medical and surgical measures to reduce visible scarring have failed, or in cases where patients are unwilling to undergo a scar revision procedure. Patients who fall in the aforementioned category are potentially good candidates for HPT and can be referred to experienced micro-pigmentation practitioners specialising in the areas of scalp micro-pigmentation and scar camouflage. The key benefit of HPT Scalp microPigmentation is that the treatment will give the patient almost instant results whilst still leaving options open for other treatments should the patient wish to explore alternatives in the future.

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Anouska Cassano is a highly experienced micro-pigmentation practitioner specialising in areas such as scalp micro-pigmentation, aesthetic permanent makeup and medical reconstruction. She is the technical expert of the Confederation of International Beauty Therapy and Cosmetology.

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