Scalp micro pigmentation (SMP) is a permanent cosmetic "tattoo" that mimics the short hairs of a closely shaved scalp. SMP offers a new treatment option for patients who are not hair transplant candidates and are willing to keep their hair very short or shave their hair to scalp level. There are a few medical conditions that may have clear applicability to this procedure including patients with alopecia areata, alopecia totalis, and a variety of scarring types of alopecia. SMP also offers excellent camouflage with a short hair style for patients who have old plugs, have had scalp reductions, or have scars from hair transplant surgeries that are disfiguring or not amenable to the individual's styling needs. There is a segment of regular hair transplant patients who would like to cut their hair short but are limited due to hair transplant scars from various harvesting techniques. SMP also offers an alternative to men who do not want a hair transplant surgery.

Since 2010, we have been offering SMP to a select group of patients who are not hair transplant candidates or for those who have had disappointing hair transplant results from failed hair transplant procedures. The following are case presentations of such individuals and their personal stories.

Case 1 is a healthy male in his mid-30s who had been diagnosed with scarring alopecia in his teens. He is not a hair transplant candidate. SMP addressed the scarring by blending in the hypopigmented areas with the adjacent shaved scalp.

Case 2 is a 30-year-old male who has had alopecia totalis since his teens. He always wore hats (indoors and out) and the condition has significantly hampered his self-esteem and social life. SMP gave this patient a frame to his face and the look of a shaved scalp. While it may be a subtle look to others, this was a life-changing event for him.

Case 3 is a 55-year-old male, Norwood V, who had the 1980's plugs with a series of scalp reduction surgeries. His donor area was limited. He gave up on corrective surgeries as he had a hard time trusting hair transplant surgeons altogether. After 25 years of wearing a hair system, he wanted the freedom of a shaved scalp. SMP filled in the hypo-pigmented plug scars and redefined a new normal hairline. He is considering a limited FUE by removing some of the remaining plugs on the front of his scalp and spreading those hairs in the bald area to create stubble that he can feel and others can see.

Case 4 is a 32-year-old male, Norwood V, with thin-quality brown hair who wanted to wear his hair short and wanted more fullness to the front, top and crown areas of his scalp. His donor laxity was not good and his donor density was low. His goal was to cut his hair short and keep his budget under control. An FUE solution would
SMP

Case 4

have been outside his budget and it may not have adequately addressed his highly visible scar from two past FUT procedures. SMP addressed the scar and the thinning of the crown, and it smoothed out a hairline that he only dreamed about before.

Case 5

Case 5 is a 22-year-old male, Norwood IIIb, with medium-quality brown hair. He had an FUE procedure believing it to be a scar-less surgery. His logic was that if the surgery did not give him the results he was promised by the doctor or if he continued to lose his hair, that he could just shave his scalp and accept his balding fate. He did not expect the FUE to produce hypo-pigmented scars nor the ridging on the front corners of the recipient sites. SMP addressed the hypo-pigmented scars as well as the visibility of the ridging in the front corners. This photo was taken immediately after the first SMP session so you can note the slight redness of the scalp, which usually lasts 2-3 days following the completion of the procedure.

Case 6

Case 6 is a 45-year-old, Norwood VI, who always shaved his head. He hated the shadow that gave the classic Norwood class VII/VII look. He was very clear that he did not want to undergo hair transplant surgery. SMP provided the patient with a non-balding hairline and an overall look of a clean shaved head.

The above patients all have their unique story and reason for choosing SMP. They all accepted the fact that SMP is not a substitute for real hair or a complete solution for their hair loss issues; however, for these individuals, the benefits of SMP outweigh its limitations.

The following are some of the limitations of SMP:
- The primary concern for SMP to potential patients is the potential change in the color of the pigment over time. The pigment used for SMP is chosen to match the color and tone of shaved hair underneath one's skin. Despite variation in hair color, most patients have a grayish (and greenish) tint after the hair is shaved from the dark roots of the hair showing through the layers of dermis and epidermis. Much like how blood vessels appear green under the skin, the increased absorption of the red spectrum of light gives rise to this phenomenon explained by the trichromatic theory of color vision (i.e., if you absorb red, you will perceive green). The light propagation through human tissue has also been modeled to show the greater decrease of red spectrum remission. In short, there is no true perception of black when it is deposited beneath the skin. The greater the depth of pigment deposit, the greater the potential change in color perception. Thus, one must choose the appropriate SMP pigment color and control the depth of pigment deposit.
- There is also concern about the permanence of SMP. Like all tattoos and micropigments, the color of SMP will likely fade to a lighter shade over time. Exposure to sun will accelerate changes in color as well. At this point, we do not have a sample patient population large enough to judge the time it takes for a significant color change requiring a touch-up; however, from experiences of other clients who have undergone similar process as well as the collective tattoo clients over the world, we assume the longevity of SMP should be in the order of many years. Touch-ups may be a requirement for patients in managing their pigment changes over time. The alternative of complete SMP removal through laser ablation may also be an option, but there has been no case report of this that we can find. The laser ablation of SMP only remains a theoretical solution for those individuals who want to reverse the process.
- Bleeding of pigment from one spot to another is a real problem and may be technique dependent. Too many procedures tend to lead to the bleeding of pigment into the depth of the skin.
- Finally, many SMP patients ask about the graying of their hair over time. This is an important issue that must be addressed before a patient undergoes SMP. SMP should be considered a permanent lifestyle changing process. Patients must accept that they need to keep their hair short, to an almost shaved appearance. If this primary concept is accepted, the graying of hair with age should not be an important issue as SMP is applied over the entire scalp thus blending in with any grey stubble that may arise. In addition, the dyeing option for patients always remains.

The tattooing of the scalp is not new. This technique has been attempted by tattoo artists for years and has been used by hair transplant surgeons in the past. Scalp tattooing is a well-
discussed topic on numerous hair transplant forums and it is
offered in a niche segment of the permanent makeup industry in
Asia, Europe, and the United States. In general, scalp tattooing
is shunned by most physicians and potential patients because
the results are highly variable and depend on the type of tattoo
machine used, the needle configuration and design, the ink used,
and the artistic style of the service provider. Internet chatter has
been building over the past year. We have been slowly perfecting
the SMP technique and we hope to standardize the techniques
through more experience, continuingly analyzing the results we
obtain. As the process is permanent, patient deformities resulting
from imperfect techniques by inexperienced operators who do not
understand the subtle nuances of SMP may produce significant
malpractice risks for the novice entering the field with no train-
ing. More information on this technique can be found at www.
scalpmicropigment.com.

References
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Editor's note: In the right hands, SMP is a very useful tech-
nique; but I don’t believe it’s an easy technique to get right. I
have seen a few cases where the hairline has been tattooed on,
similar to Dr. Rassman’s patient 2, but the tattoo looks artificial,
having a bluish tinge and a wide, low hairline. In another case,
the dye just would not “take” in the scarred donor area even after
several attempts. Having said this, there are many patients trying
to hide scars using cosmetics, wearing hats, etc., who can have
life-changing benefits from tattooing. But like any hair restoration
procedure, the tattooist needs to understand the concepts of hair-
line placement and design and the changes that occur to hairlines
with age. The following are a couple of tattooing complications
that I have come across.

The patient in Figures 1 and 2 is a 33-year-old woman who had tatoo-
ing that started to change colour. She went for tatoo removal that left her
with scars and hair loss to her eyebrows (Figure 1) that was worse on the left
side. We performed eyebrow restoration bilaterally with 410 single-hair
grafts (Figure 2) and she has recently had a second operation of 200 grafts
especially for the left side where the growth was less successful. You
will note in her Figure 1 that she has semi-permanent makeup to the
upper eyelids. This has also changed to a greenish-grey color but the patient copes successfully by applying
eyeliner over top (Figure 2).

The patient in Figures 3 and 4 is a 54-year-old woman with
eyebrow tattooing (semi-permanent makeup) that changed color
to a greenish-grey following laser tattoo removal. The area was
surgically removed (Figure 3) by a plastic surgeon prior to coming
to us for transplantation (Figure 4). Four hundred single-hair
grafts were placed. —NF

Figure 1. Eyebrow scarring following tattoo removal
(background shows residual tattoo).

Figure 2. Five months post-op: less growth in left
eyebrow.

Figure 3. Immediately pre-op showing bilateral surgical scars.

Figure 4. Immediately post-op.