

Dermatologic surgery

Shaved hair style scalp medical tattooing technique for treatment of advanced male pattern baldness patients

Jae Hyun Park, MD, PhD, Seung Hyun You, MD, and Narae Kim, MD

Dana Plastic Surgery Clinic, Seoul, Korea

Correspondence

Jae Hyun Park, MD, PhD
Dana Plastic Surgery Clinic
Samju Building 10F
Gangnamdaero 606
Gangnam-gu
Seoul 06038
Korea
Tel: +82-10-4948-7887
Fax: +82-2-512-0942
E-mail: Jay8384@naver.com

Disclosure: The authors have no conflicts of interest to declare.

doi: 10.1111/ijd.14295

Abstract

Background The most infallible approach to male pattern baldness (MPB) is hair transplantation in the thinning area in parallel to medical treatment to prevent further alopecia progression. For an individual with advanced stage hair loss, a megasession surgery is recommended to meet the high donor hair requirement. Yet a most effective therapeutic regimen for alopecia, hair transplantation inevitably has its advantages and disadvantages for it is done with the expense of donor hair sacrifice, intraoperative and postoperative pain, and unavoidable scars. Also, with poor donor condition, surgery may not even be an option. Nowadays, more patients with such limitations are undergoing shaved style scalp medical tattoo (SMT).

Objective To assess the effectiveness of SMT technique for shaved hair style.

Methods and materials A total of 80 patients who were included in the study underwent SMT for shaved hair style between June 2014 and June 2017 and were followed for at least 6 months afterward. Patients and the surgeon completed a survey about donor and recipient site surgical results using a 5-point Likert scale.

Results The average satisfaction scores of patients and surgeon were 4.8 and 4.9, respectively.

Conclusion Shaved style SMT can be considered one of the most effective treatment methods for patients with advanced stage hair loss.

Level of evidence IV.

Introduction

Irrespective of sex and age, hair thinning tends to impart an aged and unattractive look. Recently hair transplantation surgery with medication has been acknowledged as a standard therapeutic regimen for male pattern baldness (MPB).¹

A remarkable progress has been made in techniques involving hair transplantation. Lately, large sessions, transplanting more than 3,000 grafts in a single session, are often conducted. However, such megasession surgery mandates a good donor condition.² Also, there exists circumstances where hair transplantation surgery is avoided. Those in advanced stages of alopecia may believe that significant recipient coverage seems unfeasible. Those with disappointing results or donor depletion from previous hair transplantation, with surgery phobia, or with an experience of drug adverse effects, may also hesitate to choose from options of hair transplantation and medical therapeutic regimens.

Also, Asians are characterized by flatter skull shapes, lower scalp laxity, and higher scarring tendency.³ Follicles are located at a deeper depth and tend to be thicker in caliber. Furthermore, donor hair is available in smaller quantity, and scalp

skin-to-hair color contrast is greater. Therefore, in comparison to Caucasians, Asian patients are more prone to donor depletion. Follicular density of the donor area is lower in Asian yet amount of required donor hair for same recipient coverage is similar, thus raising the possibility of donor depletion.⁴ Consequently, many patients are good candidates of shaved hair style scalp medical tattoo (SMT).

The authors have accumulated cases with excellent outcome following shaved hair style SMT, thus reporting our results with the review of literature.

Materials and methods

Study participants included 80 patients who visited authors' clinic from June 2014 to June 2017 and were observed for more than 6 months after undergoing shaved hair style SMT procedure. The average age was 42 years old (ranged from 30 to 65). Thirteen reported of prior history of hair transplantation; three patients had undergone surgery by follicular unit extraction (FUE) method once, one patient by FUE and follicular unit transplantation (FUT) combo technique once, one patient twice by FUT method and once by FUE method, six by FUT, and two

patients twice by FUT only. All patients were dissatisfied with their surgical results and had decided to wear a shaved hair style. Those with less than 6 months of observation or suffering from alopecia owing to reasons other than androgenetic alopecia (alopecia totalis, etc.) were excluded from the study.

Satisfaction survey

Satisfaction survey was conducted in patients for more than 6 months after the procedure. Informed consent was received from the patients beforehand. Medical charts and photographs were reviewed retrospectively. Patients and the surgeon scored the results in terms of satisfaction using a 5-point Likert scale (1 point: very dissatisfied; 2 points: dissatisfied; 3 points: neither satisfied nor dissatisfied; 4 points: satisfied; 5 points: very satisfied).

Questions were as follows: (i) How great is your overall satisfaction in terms of the surgical results? (ii) How natural do you think the result looks? (iii) Have you been told that the micropigmentation is noticeable by others unaware of having undergone the procedure?

For objective assessment, final results were evaluated by two expert hair transplant surgeons that did not participate in the procedure of the particular patients, concerning color change, blurred margin, spreading of tattoo ink, and so on.

Results

At the start of the procedure, 13 patients were categorized into Norwood Stage 4, 15 into stage 5, 23 into stage 6, and 29 into stage 7. Those with a donor scar also received scalp medical tattoo for cicatricial alopecia concomitantly.

The average number of procedures was 4.34 times (ranging from twice to seven times). There was no adverse reaction such as folliculitis, additional hair thinning progression because of procedure and scarring, etc. Patients' subjective satisfaction score was as high as 4.8 on average, and doctor satisfaction score was 4.7.

Upon physician assessment, two patients were reported to show blurred margin of a mild degree, but the patients were satisfied with the final outcome; the result was said to be natural and unnoticed by others.

Of the enrolled patients, there was none that complained of micropigmentation being noticeable to others.

Representative cases

Case 1

A 34-year-old male patient with Norwood Stage 5 hair loss was wearing skinhead hair style with hair length less than 1 mm (Fig. 1).

Case 2

A 40-year-old male patient with advanced alopecia of Norwood stage 6 had been wearing closely shaved hair style for more than a decade (Fig. 2).

Case 3

A 43-year-old male patient who had received hair transplant surgery by FUT method twice and by FUE once with dissatisfying results underwent shaved hair style SMT with a concomitant procedure at FUT his donor scar (Fig. 3).



Figure 1 A case of a shaved hair style scalp medical tattoo in a 34-year-old male patient with Norwood stage 5 alopecia. (a) Preoperative view. (b) 6 months follow-up



Figure 2 A 40-year-old male patient, Norwood stage 6. (a) Preoperative view. (b) 6 months follow-up



Figure 3 A case of a shaved hair style scalp medical tattoo after dissatisfying results of 2 FUT surgical procedures and 1 FUE surgery. (a) Preoperative view. (b) 7 months follow-up

Discussion

Medical tattoo has been practiced for quite a long time for different reasons on various areas of the human body, including the scalp.⁵ In 2001, Traquina reported on the results of micropigmentation performed in 62 patients with scalp scars, which was the first report on application of micropigmentation on the scalp.⁶ Rassman also shared his acceptable results of scalp micropigmentation carried out on alopecia patients.⁷

Medical tattoos on the scalp have been employed under the names of dermography, medical tattoo, scalp micropigmentation (SMP™), SMT, and micropigmentation. KSHRS (Korean Society of Hair Restoration Surgery) has officially agreed upon the

term SMT to design the tattoo technique that is applied by a physician on the scalp for medical purposes.^{8–10}

Compared to those of other races, East-Asians also relatively lack body hair such as a beard, which can be utilized in case of donor depletion. Also, hair follicle is thicker and longer than Westerners, generally necessitating the use of a larger punch tip. Thereupon, a moth-eaten appearance or see-through hair of donor site can easily occur.

Thus, East-Asian patients are well qualified for shaved hair style SMT procedure. Unfortunately, there exists some cultural obstacles for closely shaved hair style since it is stereotyped in Asian cultures as to be a gangster or a criminal. One other main reason of avoiding shaved hair style SMT is the

possibility of awkward or unnatural results. However, as Eastern cultures are progressively opening up to those of Westerners, more patients are willing to receive short buzz-cut medical tattoo.

For vertex alopecia or FPHL, scalp that shows through hair is colored to simply decrease the color contrast between the showing scalp and hair. On the contrary, in performing shaved hair style scalp medical tattoo, markings delineate dots to resemble closely cut hairs.

Shaved hair style SMT mandates the highest level of expertise of all types of medical tattooing. Several thousands of small dots are made on the scalp, and even the slightest mistake, as a few dots that are much bigger or blurred, will lead to unnatural results. Such awkwardness may be concealed in case of vertex alopecia or FPHL with existing hair. For shaved hair style SMT, extra caution is necessary because there is absolutely no hair to cover the outcome which is utterly exposed just as it was performed.

Therefore, shaved hair style SMT ought to be performed only after the practitioner has gained a sufficient amount of experience and confidence in one's skills.

Additionally, one should never attempt to reach final results at one single session. The scalp varies, by patient, in thickness, nature, color, tone, hair characteristics, hair loss pattern, and the amount of ink held within the scalp. When the ink has been placed too shallow to be held by the skin, the same process can be repeated only at a deeper level during touch-up procedure. Extreme caution should be exercised to avoid deep penetration at initial sessions, which may cause the ink to spread. A practitioner should keep in mind he or she can always offer the patient's touch-up procedures if not much ink is left upon follow-up visit.

According to the authors' assessment, no participant expressed regrets about having undergone the procedure or complaints about the outcome. Patient satisfaction score was 4.8 with the majority giving a high mark of 5 points; only a few expressed a slight discontent concerning the result but were still satisfied for the result was very natural and not too obvious to others.

One should also carefully approach patients with previous hair transplantation history or scarring within the scalp to prevent an obvious dissimilarity between cicatricial and noncicatricial tissue.

Many people are concerned about a bluish tinge of the ink on the skin. Even a few errors out of several thousand dots can be very noticeable. Pigmentation too large in size or with blurry margins will be very awkward and conspicuous. The human eyes have limitations regarding eyesight; a dot or an area needs to be larger than a certain size for us to distinguish its color whether it is black, bluish, or grayish.

Therefore, small, defined, and consistent marking is crucial. Angle between needle and scalp must always be kept at 90

degrees, and scalp traction with the aid of an assistant or the use of clinician's nondominant hand helps maintain tense skin.

Possible complications following tattoo application are bleeding, localized or systemic infection, and, in rare cases, hypertrophic scar or keloid formation. A very unusual occurrence of squamous cell carcinoma has also been reported in the past.¹¹

Patients undergoing shaved hairstyle SMT must accept that they need to keep their hair of the side and back short for a lifetime, which they should be informed of and consent during preoperative consultation. They also should be notified of pigment fading with time.⁸

Patient consent and agreement on possible consequences of the procedure are crucial because awkward results or malpractice would not be easily camouflaged with this technique.

Such shaved hairstyle SMT is more popular among Caucasian or black patients, and cases done on Asian patients have not yet been reported as of now. Further comparative studies on shaved hairstyle SMT on patients of different ethnic backgrounds may be helpful for hair surgeons performing the procedure.

Cautions

Patients should be informed that the procedure may preclude the patients for terms of their lives from wearing their hair longer.

It needs to be thoroughly explained to patients about what could happen in the future, and patients' occupation, age, condition of possible safe donor area, and family history should be reviewed. Extra caution should always be used in patients of young age.

Conclusion

Shaved hair style SMT can be considered a good treatment option for advanced stage male androgenetic alopecia.

References

- 1 Bunagan MJ, Banka N, Shapiro J. Hair transplantation update: procedural techniques, innovations, and applications. *Dermatol Clin* 2013; **31**: 141–153. <https://doi.org/10.1016/j.det.2012.08.012>. Epub 2012 Oct 5.
- 2 Gabel S. Megasections: surgical indications and technical perspectives. *Facial Plast Surg Clin North Am* 2013; **21**: 419–430. <https://doi.org/10.1016/j.fsc.2013.06.002>.
- 3 Kim S, Choi TH, Liu W, *et al.* Update on scar management: guidelines for treating Asian patients. *Plast Reconstr Surg* 2013; **132**: 1580–1589. <https://doi.org/10.1097/PRS.0b013e3182a8070c>.
- 4 Park JH. Re: FUE and donor depletion. *Hair Transplant Forum Int* 2013; **23**: 227–228.
- 5 Garg G, Thami GP. Micropigmentation: tattooing for medical purposes. *Dermatol Surg* 2005; **31**: 928–931.

- 6 Traquina AC. Micropigmentation as an adjuvant in cosmetic surgery of the scalp. *Dermatol Surg* 2001; **27**: 123–128.
- 7 Rassman WR, Pak JP, Kim J, *et al*. Scalp micropigmentation: a concealer for hair and scalp deformities. *J Clin Aesthet Dermatol* 2015; **8**: 35–42.
- 8 Park JH, Moh JS, Lee SY, *et al*. Micropigmentation: camouflaging scalp alopecia and scars in Korean patients. *Aesth Plast Surg* 2014; **38**: 199–204.
- 9 Park JH, You SH. Scalp medical tattooing technique to camouflage bifid parietal whorls. *Plast Reconstr Surg Glob Open* 2016; **4**: e671. <https://doi.org/10.1097/gox.0000000000000661>. eCollection 2016.
- 10 Park JH. Association between scalp laxity, elasticity, and glidability and donor strip scar width in hair transplantation and a new elasticity measuring method. *Dermatol Surg* 2017; **43**: 574–581. <https://doi.org/10.1097/DSS.0000000000001006>.
- 11 Ortiz A, Yamauchi PS. Rapidly growing squamous cell carcinoma from permanent makeup tattoo. *J Am Acad Dermatol* 2009; **60**: 1073–1074. <https://doi.org/10.1016/j.jaad.2008.11.902>.