BACKGROUND

There are two ways to make recipient sites that will accommodate follicular-unit grafts: “pre-made sites”, in which the surgeon makes all the sites before graft insertion, and the “stick-and-place” technique, in which grafts are placed one at a time into each site as it is made. Regardless of the technique that the surgeon uses, there is no reliable method of making sites that ensures a consistent density of the incisions in the recipient zone. It has always been my impression that surgeons tend to overestimate the number of sites per square centimeter they are creating. When a surgeon says that the recipient-site density is 30 /cm², this claim implies an objective measurement. In reality, it is usually a subjective and rough approximation since the vast majority of hair-transplant surgeons rely on experience and visual assessment. However, the density of the sites made in the recipient area is of utmost importance, since it will have a direct impact on the final result. To address this need, I developed a simple and objective method based on the use of “stamp templates”, which are painted onto the patient’s scalp skin before making the incisions (Jiménez and Sosa-Cabrera, 2012).

TECHNIQUE

I will briefly discuss the process of making the templates and the stamps. Using photo-editing software (we used Corel Draw, Corel Corp., Ottawa, Canada), a variety of templates were made with dot patterns at different densities. Since in the majority of patients the goal is to produce a hair-transplant density of between 25 and 40 follicular units per square centimeter, I developed templates with 25, 30, 35 and 40 dots/cm². Template selection is then made according to the clinical situation (Fig. 9.1). Learning how to make dot patterns using photo-editing software is beyond the scope of this chapter, and numerous tutorials can be found on the internet. I designed the dot patterns following a triangular distribution, which is...
the pattern that most closely approximates the natural distribution of human scalp hair (Jiménez and Ruifernández, 1999). When the dot patterns are stamped onto the recipient scalp, each dot serves as a guide for the surgeon to create a site where a follicular-unit graft will be later inserted. A pattern with a density of 30 dots/cm² will obviously have more distance between the dots (inter-follicular unit distance) than a pattern with 35 or 40 dots/cm².

Once the dot-pattern templates have been made on the computer, they are sent to the stamp manufacturer who proceeds to make “clear stamps”, which are photopolymers normally used in rapid prototyping, stereo lithography, and 3D-printing processes. The process is as follows: first, a negative is obtained from the template that was created using the photo-editing software. The negative is covered by the photopolymer, which is a resin sensitive to ultraviolet light. The light illuminates only the photopolymer below the transparent areas, and it reacts, solidifying the pattern. Once these clear stamps have been made, they are attached to transparent blocks that are used in order to facilitate the stamping of the dot pattern onto the patient’s skin (Fig. 9.2). Although the polymer stamps stick to the block without any additional adhesive, I prefer to stick the stamps to the blocks with double-sided transparent tape. This easy-to-remove tape avoids any possible damage when removing the stamp from the transparent acrylic block for sterilization.

**Operative Considerations**

The use of template stamps can be used in any recipient area with minimal to no hair. For example, good candidates would be patients with Norwood types III and
IV with localized areas of baldness, patients with Norwood types V or VI, patients whose frontal hairline is going to be lowered, or localized areas of scarring alopecia. The only situation in which the stamps cannot be used is in areas of existing hair, in which the sites need to be made between the hairs rather than according to the pattern created by the stamp.

The surgeon has to decide which stamp to use according to the desired density. In patients with recipient areas larger than 100 cm$^2$, I normally use a stamp with a density of 25 or 30 dots/cm$^2$. In smaller areas, I tend to use stamps with higher densities of 35 or 40 dots/cm$^2$. I rarely use stamps higher than 40 dots/cm$^2$. Just before using the stamp, it is stained with the use of a paint-roller (Fig. 9.3). Gentian violet 1% solution or methylene blue 1% aqueous solution can be used for this purpose since many surgeons already use both products to highlight the recipient sites (Rashid, 2005). I use the paint-roller rather than dipping the stamp into the staining solution to avoid staining the base of the stamp. Immediately after staining the stamp, I press the stamp onto the patient’s recipient area, and the resulting pattern of dots accurately reproduces the desired specific density (Fig. 9.4).

Once the recipient area is anesthetized, the incisions are made through the dots using the surgeon’s preferred instrument (Fig. 9.5). I have found it is better when using the stamps to make all the sites first (“pre-made sites”). As a general rule, I use 1-mm blades or 19G needles for making the sites for 2- and 3-hair follicular units when using the 25-, 30-, or 35-type templates, 0.9-mm blades or 20G needles when using the 40-type templates for 2-hair follicular units, and 0.7-mm or 21G needles when using the 40-type template for 1-hair follicular units. Once the sites
are made, the area is thoroughly cleaned with saline, but the sites retain the gentian violet or the methylene blue at the skin surface, an additional benefit of this method that helps tremendously in identifying the recipient sites (Fig. 9.6). If the surgeon uses the stick-and-place technique or uses implanters, there is a danger that the dot pattern painted on the scalp will be smudged and become useless. To avoid this outcome, I would suggest first marking the dots using a fine-caliber needle, e.g., a 25G needle. This should be enough to keep the dot pattern visible.

**THOUGHTS AND PEARLS**

In my opinion, the main advantage of the “template-stamp method” is that it serves as a guide for the surgeon to create recipient sites in order to achieve a specific density, avoiding reliance on subjective estimations. An additional advantage is that the staining process helps staff to visualize the recipient sites, facilitating the process of graft insertion.

I have also found that the use of template stamps is a great learning tool for the surgeon. The template stamps can be used by the surgeons to practice on artificial models, improving their perception of the distance between the follicular units at different densities (Fig. 9.7). Template stamps can also be very useful in hair-density research studies for creating accurate densities in a reproducible manner. I have also realized that the dot-pattern drawings help patients to understand the surgical process and to see how close the follicular-unit grafts need to be implanted in order to achieve a desired density.
FURTHER READING

