

Easier and More Efficient Implanting: A Two-Handed Technique for Faster and Less Traumatic Graft Placement

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For more than 50 years, forceps have been the primary tool for graft implantation in hair restoration surgery. To place a graft, this tried-and-true device requires the use of the dominant hand. The surgeon's (or assistant's) other hand, consequently, would remain idle throughout the graft placement phase of the operation. At best, his or her other hand could be a platform for holding grafts that awaited placement.

With this new method of implantation and the aid of Shiao micro-implanters (Figure 1), we can now involve both hands in graft placement, resulting in faster and less traumatic implantations. *Two hands are faster and more efficient than one.* In this two-handed technique, the dominant hand continues to hold the forceps for adjusting the implanted grafts, the other hand, however, instead of remaining idle, now places grafts using the Shiao micro-implanter (Figure 2).

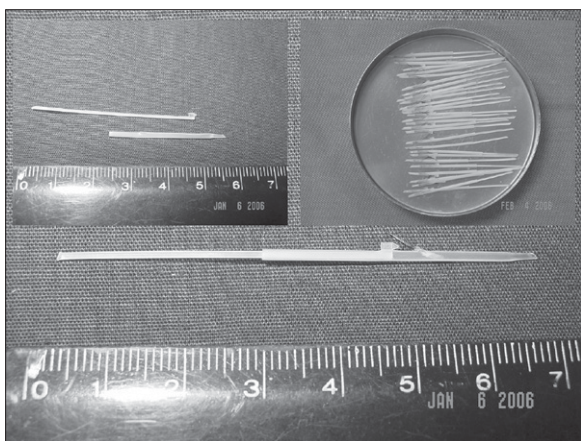


Figure 1. The Shiao micro-implanter has only two parts: a small plastic tube with a tapered end and a longitudinal slit going from the tapered end to the middle of the tube, plus an inner pushrod with a stopper at its tip to prevent the graft from being inserted too deep into a site.

In the past year, we have refined this technique through close to a 100 densely-packed ($30 + \text{FU}/\text{cm}^2$) mega-sessions (2,000 FUs). In our experience, this two-handed technique using forceps and Shiao micro-implanters lessens the time it takes to complete the implantation phase by 25%. In order to verify what we have experienced, we designed a simple study to compare the rate of placement by the traditional method and our new method.

Methods

Eight patients, all male, ethnic Chinese, with a mean age of 35, were included in this study. No specific selection criteria were used. These 8 patients represented 8 consecutive patients who came to our clinic for hair restoration surgery.

For this study, we employed the medium bore Shiao micro-implanters and 18-gauge needles. We trimmed the grafts of excess adipose tissue for better fit inside the implanters. The graft sites were pre-made with 18-gauge needles and the sites were stained using gentian violet.

We compared the time necessary for each patient to receive 72 grafts by the two-handed technique (forceps + micro-implanters) and 72 grafts by forceps alone. Two assistants with similar skill levels simultaneously placed these grafts on opposing halves of the patient. One used forceps alone while the other used forceps and micro-implanters. After each assistant placed half of the grafts (36), they switched their methods of placement to help remove potential data bias from the skill level of the assistants and the different sides of the head.

Results

From the eight subjects, the average rate of placement using forceps alone was 6.88 ± 1.82 FU/minute. The average rate of placement using the two-handed technique was 9.00 ± 2.19 FU/minutes, a 30.8% improvement in speed.



Figure 2. In this two-handed technique, the forceps remains in the dominant hand for adjusting implanted grafts when necessary, the Shiao micro-implanter on the other hand does the actual graft insertion.

With the small sample size and the same two surgical procedures on each patient, the data was analyzed by paired t-test. The mean of the differences 2.12 ± 1.11 produced a t-value of 5.43 and a $p < 0.001$, suggesting the difference as statistically significant.

Discussion

The implantation phase has traditionally been the most challenging and time-consuming part of hair restoration surgery. It is challenging because of the high degree of manual dexterity needed to place a tiny follicular unit into a very small incision site. It is time-consuming not only because it is difficult but also because only two people can place grafts at the same time. Like with basketball players, some assistants possess the natural talent in placing while others do not. At the tips of their forceps, inexperienced or untalented assistants have sacrificed more than a few follicles and buried them in the scalp. Such massacre has left many painful memories for surgeons who start new hair restoration sur-

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gery clinics, or who have lost key assistants. Because of the difficulty involved, even a talented assistant may require four to six months to train.

In our attempt to address these issues in placing grafts, we developed the two-handed technique utilizing our micro-implanters and forceps. To put this technique into practice, we typically employ 4 assistants and 30–40 micro-implanters for each placing session.

During a placing session, the surgeon first makes sites before placing. The loader then loads the grafts into micro-implanters, and the transporter takes the loaded implanters to the two placers. After the placers have placed the grafts into pre-made sites, the transporter resets the empty micro-implanters and takes them back to the loader where the process is repeated.

The many challenges are addressed in the following ways: by using two hands instead of one, this technique allows faster and more efficient placing; by utilizing micro-implanters, this method reduces potential trauma to grafts and makes placing easier; by adding a loader and a transporter, more people work on the implantation process concurrently to speed the procedure.

One key aspect of this two-handed technique is the utilization of the Shiao micro-implanters. In addition to easier placement, the micro-implanters potentially reduce trauma to the follicular units in two ways. First, containing the graft inside an enclosed chamber of the micro-implanter reduces desiccation. Second, because forceps handle neither the bulb nor the bulge of the graft during initial implantation, we can reduce the risk of crush injury by the forceps.

Because the micro-implanter takes away the most difficult and destructive part of placing, an added benefit of this technique is the significant reduction of the learning curve for new assistants and the equalization of performance from existing assistants. Prior to the adoption of this two-handed technique combining forceps and micro-implanters, only two

assistants in our team were skilled enough to place grafts. Now, with this easy-to-learn method, all six of our assistants are able to place 6–10 grafts per minute.

Conclusion

Our results show a statistically significant 30% improvement in the rate of graft placement when we use the two-handed technique combining forceps with the Shiao micro-implanters. Because this technique relies on the use of micro-implanters, additional staff to load the grafts into the micro-implanters is necessary. To support two assistants placing grafts simultaneously, we designate a loader and a transporter who resets the implanters and carries the micro-implanters between the loading station and the patient. Proper trimming of the grafts is also crucial. For clinics with four or five assistants, this poses no problems. It becomes an issue only for clinics with fewer than four assistants. This issue aside, the many advantages of this technique include:

1. *Faster graft placement.* Assistants reported preference over using forceps alone, especially in difficult-to-place patients.
2. *Almost no trauma to follicular units during placement.* Micro-implanter decreased dehydration of grafts, and forceps never touched the bulb or the bulge of a follicular unit during initial implantation by micro-implanter.
3. *Short learning curve for graft placement.* Our assistants became comfortable with the two-handed technique after about five cases (one week).
4. *Equalize competency in graft placement.* Using this technique, every assistant could place grafts without difficulty, reducing the dependency on select graft-placement assistants in a clinic. ♦

Editor's Note:

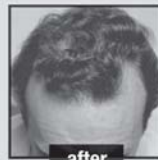
Apparently, in the Shiao clinic, the "slow" technique resulted in planting grafts at a rate over 400 grafts per hour per assistant, which is quite fast. If indeed these implanters allow placement as fast as 600 grafts per hour, I'm certainly interested in trying the device. —RSH

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