

Total Micrografting Hair Transplantation Using a New Hair Implanter

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Background : Hair transplantation is a continuously evolving era towards a more natural style and micrografting in greater quantities is becoming an unmistakable trend.

Objective : A rapid, simple method to make a micrograft implanter with low cost and a case of total micrografting using this new hair implanter are presented.

Methods : We devised a simple method to make a micrograft hair implanter using a spinal tapping needle and did total micrografting with this device 3 times on 1 patient.

Results : Cosmetically, hair transplantation using our device produces hair that is slightly less dense in a normal individual. However, our technique gives a good balance in distribution of hair with no scarring which contribute to a natural style appearance.

Conclusion : Total Micrografting with our new implanter produces a natural appearance without the artificial look and scars typical of the minigrafts or punch grafts in Koreans. So we consider this device as a another alternative device in hair transplantation.

(Ann Dermatol 9:(3) 177~181, 1997).

Key Words : Hair transplantation, Micrograft hair implanter

Hair transplantation is currently the most frequently performed cosmetic procedure for men and it has evolved over the past several decades.¹ The advent of mini- and micrografting to create a more natural and refined hair line can be regarded now as the single most important development in hair replacement surgery in the past two decades.² Today, the implantation of micro- and minigrafts is accomplished in different ways³⁻¹⁷.

In Korean men, the round punch graft or minigraft has been disappointing in its end results; because the hair of the scalp is coarse, straight and black in color, plugginess and tufting are common prob-

lems¹⁸. Scarring like a cobble-stone is also a big cosmetic problem. The above problems can be eliminated by micrografting using small sized grafts.

Total micrografting or micrografting in extensive quantities is a procedure that newly developed method in the limited alopecia and is particularly useful in patients who still have hair in the recipient area¹⁰. Because of its advantage and effectiveness in Koreans, we considered our patient as a good candidate for total micrografting. Unfortunately, there are several disadvantages in the micrografting procedure. The most prominent drawback is the laborious process of preparing and implanting these tiny grafts one at a time. The second problem is the density of recipient sites. The cost reduction of hair transplantation surgery is also of great importance and any improvement in cost reduction is very desirable.

We devised an instrument with low cost that would easily implant micrografts and remain affordable. We found an easy way to make a micrograft

Received October 30, 1996.

Accepted for publication March 18, 1997.

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hair implanter and designed a new micrograft hair implanter. This device is easily prepared in any office with a spinal tapping needle. The relevance of this device in Korean androgenetic alopecia patients was evaluated by total micrografting hair transplantation 3 times on 1 patient.

MATERIALS AND METHODS

1. To make a micrograft hair implanter

The standard 14,15,16,18-gauges spinal tapping needles are placed on a needle holder or vice, with care being taken not to compress the lumen. Any hand engine, such as those used for dermabrasion, with a 0.25-mm carborundum disc at 15000-20000

rpm will easily cut the tip and make a new bevel and fashion the "slot" in the needle shaft (Fig. 1). The slot should be approximately 10mm long and 1mm width. And the spring is inserted into the stylet. The holder portion of stylet was formed by segmenting with the same disc (Fig. 2B, 2C).

2. Surgical procedure or technique

Preparation of micrografts has been well described.^{2,3,5,12,13,15,18,20} We use the multi-blade scalpel for donor harvesting and we divide the strip using a number 20 scalpel blade into microsegments for micrografts. Great care must be taken in the excision of the ellipse to incise parallel to the hair shafts to minimize marginal loss of follicles. It is very useful and less time consuming in preparation for micrografts.

Once the micrograft is prepared, the micrograft is ready to be placed into the needle of the new hair implanter depending on the graft size (Fig. 2A). We generally do not remove or retract the stylet, it is automatically retracted. The needle is then inserted into the recipient site the stylet is compressed, the entire device is removed, leaving the graft implanted (Fig. 3).

To further facilitate the transplantation process, we routinely use the step by step operation and two teams of two personnel. The first and second member prepares the mini- and micrografts, the third member loads the grafts into the hair implanter, and the fourth implants the graft as the

Fig. 1. Sixteen gauge spinal tapping needle held by needle holder. Hand engine with disc attachment. 10 mm-long slot was formed.

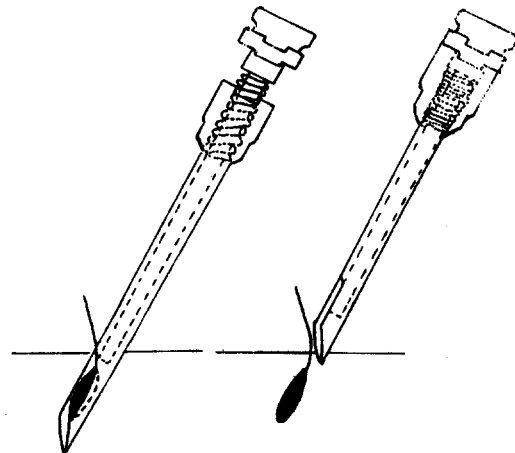


Fig. 2. A single hair is ready for placement into the micrograft hair implanter (A). The tip (B) and body (C) of the hair implanter.

Fig. 3. The micrograft hair implanter with stylet in place.

Fig. 4. Postoperative photographs of patient(left:after first session; right:after 3rd session, postop. 9 months) with Norwood Va grade androgenetic alopecia show no scarring with good hair growths.

the previous implanter is passed back for reloading.

The donor area is trimmed and anesthetized with tumescent anesthesia(0.25% lidocaine, sodium bicarbonate, epinephrine and saline infusion) and regional nerve block(1% bupivacaine). After the hair transplantation, we did not use a bandage or dressings.

Case

A 28-year-old man visited our Department of Dermatology at Korea University Hospital because of increasing loss of scalp hair. His major desire was a natural hair style without scarring. Physical examination revealed androgenetic alopecia with Norwood type Va. His father also has Norwood type VI androgenetic alopecia. His past medical history was not contributory. No other illness or laboratory abnormalities were noted.

We did total micrografting using our new micrograft hair implanter on him 3 times by 3 month intervals. We introduced the multiblade scalpel for donor harvesting and we divide the strip using a number 20 scalpel blade into microsegments for micrografts. It was very useful and less time consuming in preparation for micrografts. Once the micrograft is prepared, the micrograft is ready to be placed into the needle of the new hair im-

planter depending on the graft size(Fig. 2). We generally do not remove or retract the stylet, it is automatically retracted. The needle is then inserted into the recipient site and the stylet is compressed, after that the entire device is removed with leaving the graft implanted(Fig. 3). To further facilitate the transplantation process, we routinely use the step by step operation and two teams of two personnel. The first team prepares the micrografts, the second team loads the grafts into the hair implanter, and implants the graft as the the previous implanter is passed back for reloading. The donor area is trimmed and anesthetized with tumescent anesthesia (0.25% lidocaine, sodium bicarbonate, epinephrine and saline infusion) and regional nerve block(1% bupivacaine). We did not use a bandage or dressings postoperately.

We considered him as a good candidate for total micrografting because of its advantage and usefulness in Koreans. Cosmetic results of hair transplantation using our new micrograft hair implanter as documented by follow-up examination and photography were good(Fig. 4). However, the density of the scalp is less dense than in other procedures, so repetitive surgery to increase density is needed.

DISCUSSION

In the debate over the method of hair transplantation, total micrografting is becoming a popular trend¹⁸. Korean men (skin type III-V) in particular have coarse scalp hair and because of these factors, which is straight and black in color, the round punch graft or minigraft have been disappointing in their end results. The plugginess, tufting and scarring like a cobble-stone are common and big cosmetic problems¹⁸. These problems can be eliminated or reduced by recently developed micrografting techniques using the small sized grafts.

Micrografts, containing one or two hairs each, that have been sliced off the side of round grafts, or a strip, are obtained with a power micropunch or manual preparation. They are placed into the holes usually made with a no. 16 hypodermic needle (Nokor needle),¹¹ an Inaba 18-gauge micrograft insertion needle¹² or 14-gauge 1.5-inch needle.¹³ In addition, new devices such as Choi's hair transplanter¹⁴ and the micrograft implanter¹⁵ have been recently developed by the concept of combining two steps into one, i.e. the creation of the recipient site and insertion of a graft. Others have described the use of incisional slits for the placement of micrografts^{16,17}. Preparation of micrografts has been well described^{2,3,5,9,10,12,,14,18-20}.

Total micrografting or micrografting in extensive quantities is a procedure that has been a newly developed method in the treatment of extensive alopecia^{18,19,20}. However, the most prominent drawback has been the laborious process of preparing and implanting these tiny grafts one at a time. So we introduced a multiblade scalpel for minisegmentation and step by step procedures in micrografting and it has decreased our operative time and improved our results. It is very useful and less time consuming in preparation for micrografts. The second problem is creating subsequent holes which tends to disturb recently placed near-by grafts. This problem usually occurs with large sized needle (>15 gauge) insertions. Our experience was with 3 or 4 hair follicles for the 14, 15 gauge and single or double hair follicles for the 16,18-gauge. First we chose the 14, 15 gauge for easier placement and visualization and 3-4 hairs were implanted at a time. The smaller sized instrument causes minimal tissue damage and less interruption of the circulation. The process described above allows us to place ap-

proximately 500-600 micrografts in an about 3 hours by 3 dermatologists. The third problem is the density of recipient sites. However, surgically increasing the density with extensive total micrografting reduces the density and satisfies the patient's objectives¹⁸.

And the cost reduction of hair transplantation surgery is of great importance in relation to the popularity of this procedure and any improvement in cost reduction is very desirable. So we devised an instrument with low cost that would easily implant micrografts and remain affordable. A similar device to the our micrograft hair implanter was first described by Dr. Choi¹⁴ and is known as the Choi hair transplanter. The Choi hair transplanter is itself a 1y6,18-gauge needle. It is very useful in micrografting but it is expensive for us, and has a weak disposable device. Another similar homemade device using a 14 gauge IV catheter needle with an opening made with a Dremel tool has also been described by Dr. Pignataro.¹⁵ It is an easily prepared and economically available device but it is itself a 14-gauge catheter needle which is not suitable for single hair transplantation for Koreans.

The advantages of micrografting previously described by other authors are as follows:^{3,5,9,12,14,15,18} 1. The problem of plugginess, tufting, a corn stalk appearance of the individual grafts or cobble-stone scarring is eliminated. 2. No recipient tissue site is removed and the attention need only be directed toward maximizing density 3. Hair growth has been excellent: This is probably due to the decrease in the trauma of graft placement and minimal interruption of circulation. 4. The preservation of existing hair in cases of early androgenetic alopecia disguises very effectively the ongoing procedure. 5. The procedure can be used as an adjunct to improving the cosmetic quality of those who have had previous punch graft sessions. 6. The rapidity of healing allows most patients to continue their normal schedule of activities without disruption from the first postoperative day. 7. The uniform dispersal of small grafts gives the patient the advantages of choosing the number and timing of future procedures. 8. The ability to precisely place the hair in a natural direction.

The adjunct advantages of our new micrograft hair implanter are as follows: 1. It is easy way to make and use in the office. 2. Permanent use is possible by refining the needle. 3. Cost reduction of

hair transplantation is possible. The cost and method of making our new micrograft hair implanter is the cheapest and easiest of all other devices for micrografting. 4. A relatively formless fragment or residual fragmented hair follicles are also used in our devise, so the loss of hair in processing is minimal. 5. Our micrograft hair implanter obviates the need for other devices for the placement of micrografts or minigrafts.

The relevance of our new device in Korean androgenetic alopecia patients was evaluated by total micrografting hair transplantation 3 times on 1 patient. We considered our case as a good candidate for total micrografting because of its advantage and usefulness in Koreans.

In conclusion, as a part of the continuing evolution of micrografting, we describe a simple method to make a micrograft hair implanter and its usefulness was confirmed by the effect of total micrografting hair transplantation in our case report. As a result it provides another alternative device and advantage of producing more economic hair transplantation for both limited and extensive androgenetic alopecia. As the search for the perfect hair replacement process continues to evolve, we hope this procedure will prove helpful.

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