



Follicular Unit Transplantation Megasections

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Possibly no other term recently introduced to hair transplantation has been more poorly understood or misused than the term "Megasection." Many doctors have marketed that they perform "megasections" to suggest that what they are doing is the most advanced state-of-the-art technique. The reality is that performing large numbers of grafts, beyond the capacity of the surgical team, or with a technique that does not allow the body to "support" such a large number of grafts will actually be detrimental to the outcome of the surgery and will risk poor graft growth.

At NHI we use large sessions routinely as part of our normal surgical planning when it is appropriate for our patients. Follicular Unit Transplantation technology allows for the use of large numbers of grafts because of the very small recipient wounds. The skill of our surgical team ensures that follicular units are handled in a way that will maximize their growth.

A Megasection (giant session) implies that the number of grafts used "pushes the envelope," so that the procedure borders on upper limit of what is safe. For this reason, we prefer to simply talk about the number of grafts used in the procedure. With 1500 grafts being our average session, and our normal range from 600 to 2800, we arbitrarily refer to sessions over 1500 as being "larger," but we would like to stress that we only plan procedures that are well within the capabilities of our staff, so that maximum growth will be assured.

The following chart illustrates the number of follicular unit grafts that we commonly transplant in the first session arranged according to specific Norwood classifications.

| Norwood Class | Follicular Units |
|---------------|------------------|
| 3 | 800-1100 |
| 3 Vertex | 800-1300 |
| 3A | 1300-1600 |
| 4 | 1100-1800 |
| 4A | 1700-2100 |
| 5 | 1500-2300 |
| 5A | 1800-2400 |
| 6 | 2000-2600 |
| 7 | 2000-2800 |

In patients who have Norwood Class 3 Vertex, 4, 5, 6 or 7 hair loss patterns, the numbers will vary depending upon whether crown coverage (either partial or full) is planned. The numbers in the upper part of the range generally represent at least some light coverage into the crown. The number of follicular grafts planned will also depend upon the patient's scalp laxity, density and a number of other important individual variables that are determined at the time of consultation.

It is interesting to compare the above chart with the one published in 1995 in our original article on Follicular Transplantation. The recommended number of follicular unit grafts in the lower ranges is identical. However, in the upper ranges the numbers of grafts that we now recommend are considerably less. The reason is that when the 1995 article was written we were using a multi-bladed knife to harvest the donor strip and loop magnification for the dissection. This caused considerable loss of follicles and a larger number of grafts were needed to achieve a satisfactory degree of fullness.

With Single Strip Harvesting and Microscopic Dissection, the follicular units are preserved and transection of follicles is minimized, so that the same degree of fullness can be achieved with a significantly smaller number of grafts. Please click on these sections to learn more about these important components of the Follicular Unit Transplantation procedure.

As discussed, hair transplant sessions using large numbers of grafts (>1500) are possible when the recipient sites are kept very small because the total trauma to the scalp is kept to a minimum. But in order for grafts to fit into these small sites, they must also be kept small. The use of individual follicular units always insures that the maximum amount of hair can fit into the smallest possible site (by avoiding the transplantation of unnecessary tissue). In this way not only will the

wounds be kept small, but you will get the maximum cosmetic benefit from each graft.

But what specifically are the advantages of performing large sessions? After all, they are time consuming, require a larger staff, and are more expensive for the patient (at least in the first procedure). There are a number of very important reasons to transplant in large sessions. Some of them are specifically related to the use of follicular units and some to hair transplantation in general, but all significantly affect our patient's wellbeing. They may be summarized as follows:

- Social reasons (see Fast Track)
- Planning for telogen effluvium
- Economizing the donor supply
- Enhancing the "complexion" of the follicular units

Planning for Telogen Effluvium

Balding is a progressive process by which full-thickness terminal hairs gradually decrease in length and diameter in a process called miniaturization. This is a consequence of both the shortening of the anagen (growing) phase of the hair cycle and the shrinking of the germinative (growth) parts of the follicle. Miniaturization is a universal aspect of androgenetic alopecia and accounts for most of the early cosmetic changes in hair loss. In other words, early in balding, the "thinning" that one notes is really due to thinning (i.e. miniaturization) of the hair shafts, rather than the actual loss of hair itself.

In spite of phony claims by some doctors, regardless of the technique, an inevitable aspect of hair transplant surgery is that the patient's existing hair in, and around, the transplanted area has a chance of being shed as a result of the procedure. The hair that is at greatest risk of being lost is the hair that has already begun the process of miniaturization. If this hair is near the end of its normal life span it may not return.

Often this shedding is mild and insignificant, but at times it can be substantial enough to leave the patient with a thinner look after the procedure than before he started. The reason is that in some patients (especially those that are younger and in very active stages of hair loss) large amounts of hair can be undergoing this process of miniaturization. Identifying those patients especially at risk, educating all patients that this process can occur, and planning for it surgically are thus integral parts of hair transplantation.

Rather than not telling patients the truth about its possibility, the following is how the doctor can easily plan for telogen effluvium:

1. Defer transplanting patients who are very early in the balding process, i.e. those who are content with the way they look now but are more concerned about future hair loss. A good rule of thumb is to wait until the patient needs a minimum of approximately 600-800 follicular units before considering surgery. Often medical therapy, rather than surgery, would be appropriate for these patients.
2. When considering surgery, define the boundaries to be transplanted via densitometry as well as by gross visual inspection.
3. Transplant through (rather than around) an area that is highly miniaturized, since it is likely that this area will be lost by the time the transplant has grown in.
4. Plan to use enough follicular unit grafts so that the amount transplanted hair is greater than the amount of hair that will likely be lost from telogen effluvium.
5. In areas, of extensive miniaturization, it may be appropriate to transplant follicular units in the same density as if the area was totally bald.
6. Be certain that your doctor understands this issue and has enough experience dealing with it.

Economizing The Donor Supply

Surprisingly, the concern over the finite nature of the donor supply is a rather recent development in hair restoration surgery. But since it is the ultimate limiting factor in all hair transplants, every possible effort should be made to insure the maximum yield.

The donor supply is more sensitive to donor density than one might think. In fact, for every unit change in donor density, there is a 2-fold change in the amount of movable hair (for more details, click on Follicular Transplantation or the Logic of Follicular Unit Transplantation). Therefore, it is important for the doctor to actually measure with a densitometer, and not just "eyeball," the density when he is evaluating you. This is the only way that he can properly plan how much hair he needs to remove and the only way he can ensure that there will be an adequate supply for the long-term.

Proper harvesting techniques and precise follicular dissection are extremely important if one wants to ensure maximum donor yield. Let's speak for a moment about how using large sessions help maximize the donor supply.

Regardless of good the surgical technique, each time an incision is made in the donor area, and each time sutures are placed, hair follicles are damaged or destroyed. This damage can be greatly minimized (but not totally eliminated), by keeping the sutures very close to the wound edges so that they don't encompass much hair. In subsequent procedures any injury can also be reduced by using the previous scar as the upper or lower boarder of the new excision. In this way

the amount of distortion and possible damage to existing hair is limited to only one free edge.

There are other more subtle effects of the surgery. In all healing, even with primary intention closures, collagen is laid down and reorganized. This distorts the direction of the hair follicles and increases the risk of transection in subsequent procedures. In addition, the fibrosis makes the scalp less mobile for subsequent surgeries, thus decreasing the amount of additional donor tissue that can be harvested.

It should be clear that each time there is surgery all of these factors come into play, so that transplanting in large sessions, which minimizes the total number of individual procedures, will conserve on total donor hair. A simple rule to follow is that you should never do over two procedures what you can easily accomplish in one.

Sorting Follicular Units

A final issue regarding the use of large sessions, is their ability to enhance the complexion of the follicular units generated from the donor strip. The logic behind this is very straightforward. In follicular unit transplantation the numbers of grafts present in any given size donor strip is determined by nature, since each graft represents one follicular unit. In contrast, in mini-micrografting techniques, the numbers are determined by the surgical team who cut the grafts "to size" depending upon how many of each size the surgeon feels are needed. For example if the "mini-micrografter" needed 200 single hair-grafts, he might divide up 100 two-hair grafts to produce 200 ones. If one felt he needed 100 4-hair grafts, he might combine 200 two-hair grafts to satisfy his needs. As we have discussed in earlier sections, this is strictly "taboo" in Follicular Unit Transplantation, since the splitting of units risks damage and poor growth, and the combining of units produces unnecessarily large wounds and results that are not totally natural.

It follows that if we are to use only the naturally occurring individual units we are then limited by their normal distribution in the scalp and with larger sessions, greater numbers of each type of unit will be generated. For example, in a scalp of average hair density (2.1 hairs/mm²), a donor strip of 1 cm x 20 cm would contain approximately 2,000 follicular units of the following distribution:

| | |
|------|-----------------|
| 400 | 1 hair implants |
| 1000 | 2 hair implants |
| 500 | 3 hair implants |
| 100 | 4 hair implants |

In the same patient, a 5-cm strip of the same width would contain 500 follicular units in similar proportions yielding:

| | |
|-----|-----------------|
| 100 | 1 hair implants |
| 250 | 2 hair implants |
| 125 | 3 hair implants |
| 25 | 4 hair implants |

In the average patient, it takes approximately 250 single hairs to create the soft transition zone of the frontal hairline, so in the smaller procedure the number of single hair grafts would be inadequate if one wanted to complete the procedure in one session. At the other end of the spectrum, one might need 500 of 3- and 4-hair units placed in the "forelock" part of the scalp to give the patient a full, rather than diffusely thin look frontal. The smaller strip would only generate 250 of the larger three and four hair grafts, an inadequate number for this purpose. Clearly, then the logic of using larger procedures is that they will offer the surgeon the greatest flexibility in designing the transplant without having to combine or split follicular units.

As can be seen in the above figure, the patient's absolute hair density will greatly effect the proportion of each of the 1-, 2-, 3-, and 4-hair follicular units found in the scalp. In patient's with low hair density, a substantial proportion of follicular units will contain only a single hair and therefore the 1-hair grafts needed to construct a frontal hairline will be plentiful. In patients with high density, the higher proportion of the larger 3- and 4-hair units will provide the "natural resources" to create significant fullness in certain areas.

The larger follicular unit grafts are most commonly used in the forelock position since greater density in this area is very desirable. How the different size follicular units are utilized will greatly affect the cosmetic outcome of the transplant and deciding their density and distribution is an "art" in itself. For further reading click on Aesthetics of Follicular Transplantation.

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