

Hair Transplantation in Advanced Male Pattern Alopecia

The Role of Incisional Slit Grafting

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The technique of incisional slit grafting is described and discussed. The results of the use of this technique for hair transplantation in patients with Norwood Type VII or advanced alopecia are reported. J Dermatol Surg Oncol 1991;17:567-573.

The alopecia classification of Norwood Type VII is reserved for those male patients who present with the most severe degree of male-pattern balding¹ (Figure 1). These patients present particular difficulties in any attempt to achieve acceptable cosmetic results from standard round graft hair transplantation. With few exceptions, Norwood Type VII patients have generally not been considered good candidates for hair replacement.

The advent of incisional slit grafting in addition to micrografting has made it possible to perform hair transplantation on these patients with surprisingly good results. Incisional slit grafting is the terminology given by the authors to define a technique in which no tissue is removed from the recipient site. Thus, all grafts are placed into sites produced by a single stab incision. To accomplish this, no round grafts are used; only quarter grafts are utilized. These are produced by quartering a 4.75-mm round graft. The goal of transplantation in these patients is not to restore them to the appearance they possessed prior to the onset of hair loss, but rather to frame their faces and design and execute a pattern compatible with mild to moderate male-pattern alopecia. A key factor in achieving this goal is the creation of a wide anterior frontal zone comprised of single hair grafts.

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Patients transplanted in the above manner are thereby endowed with the natural appearance of early to moderate thinning, a dramatic improvement over their initial state of advanced alopecia and, moreover, one that will not progress.

There are two previously treated groups of patients who were in large part responsible for our understanding of incisional slit grafting in hair transplantation. The results obtained in these patients led in turn to the clinical trial of the strategy of using incisional slit grafting by utilizing quarter grafts and micrografts exclusively, ie, to the exclusion of round grafts, in patients with advanced male-pattern alopecia.

The first group of previously treated patients were women with moderate to severe androgenetic alopecia. These women displayed diffuse hair loss involving much of the scalp, with some sparing of the occipital region. The use of the technique of incisional slit grafting coupled with micrografting yielded good to excellent cosmetic results in these patients.

The second group of patients were men with crown alopecia. In this group, quarter grafts were used to transplant the crown region. The observed results were excellent, with no stalking or noticeable scarring or cobblestoning.

The observation of good to excellent results in these groups of patients led to the trial of transplantation in patients with extreme, Norwood Type VII, alopecia. The technique for this approach is described below.

Materials and Methods

The transplantation process is divided into a minimum of four sessions. In the first session, a high, mature frontal hairline is drawn between 8.5 and 9.5 cm from the midglabellar line. This will establish the pattern and ensure consistent and accurate placement of the quarter grafts and the micrografts. Round grafts that are 4.75 mm in

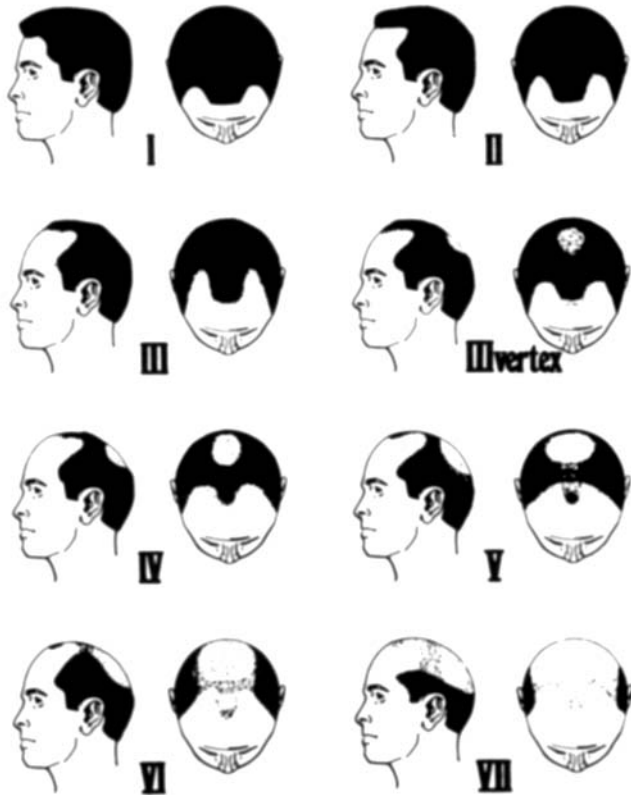


Figure 1. Standards of classification of most common types of male pattern baldness. (Reprinted with permission from Ref. 1.)

diameter are harvested from the occipital region (Figure 2). The donor site is closed primarily as a single incision, with 3.0 prolene in a continuous running suture. Each 4.75-mm graft is then quartered (Figure 3). This is achieved by bisection of a 4.75-mm round graft and subsequent bisection of each half graft. The quarter grafts are placed into recipient sites produced by a single stab incision with a #10A round blade (Figures 4 and 5). This

Figure 2. Donor site. Donor hair is harvested in the form of 4.75-mm round grafts using a Bell hand engine.

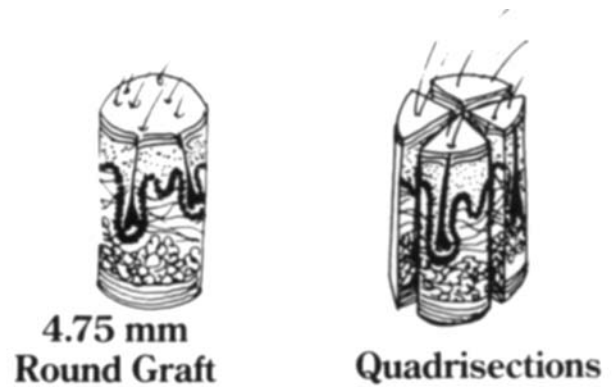


Figure 3. Graft prep. Using a #15 scalpel blade, each round graft is quadrisectioned.

creates a nearly perfect fit for the quarter grafts. No recipient tissue is removed. The recipient sites are placed perpendicular to the drawn hairline and are approximately 2-4 mm apart.

Micrografts (one or two hair grafts) are individually dissected from quarter grafts. The recipient sites for the micrografts are then made with 18-gauge needles. The 18-gauge needles are inserted into a wide feathering zone extending 2-3 cm in front of the quarter grafts. The needles are left in place 10-15 minutes prior to their removal (Figure 6), and in this manner act as dilators. Both the quarter grafts and the micrografts are inserted into their recipient sites with the use of jewelers forceps (Figure 5). During the first session, a minimum of 120 quarter grafts and 60 micrografts are used (Figure 6).

Figure 4. Site prep. A single stab incision is made with a #10A scalpel blade to create a perfect recipient bed for each quarter graft.



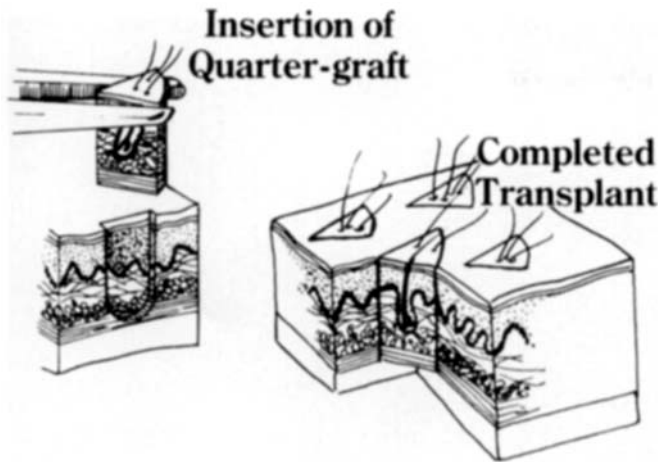


Figure 5. Grafting. Jeweler's forceps are used to insert each quarter graft into its respective stab incision.

Session two is performed 1 month after session one. As in session one, approximately 120–150 quarter grafts and 60–90 micrografts are used. After the frontal zone is created, the quarter grafts are again placed in a radial pattern. The grafts are allowed to grow for approximately 4 months before beginning session three, which is performed essentially in the same manner as the first two sessions.

Session four is accomplished 3–4 months after session three. Again, approximately the same number of grafts are used, but occasionally we employ up to 200 quarter grafts and 100 micrografts per session. Experience with this technique has shown that in order to achieve sufficient density, the number of quarter grafts employed each session should be 120 or more.

It is extremely important to create an ill-defined frontal hairline. The frontal hair should not be as dense as the temporal hair. In addition, it is essential to create an anterior-posterior density gradation in the front zone of 2–3 cm where only micrografts are used.

These four sessions will provide the minimal number of grafts essential to the framing of the face and for a cosmetically acceptable final result. Many patients request additional sessions. When accession to this request is indicated, the same procedures are used, and grafts are interspersed between those of the first four sessions in the same orientation. Based on experience with six patients, a minimum of 400 quarter grafts and 200 micrografts are essential for a successful result.

The results of the use of incisional slit grafting in Norwood Type VII alopecia are shown in photographs of four patients taken before and after transplantation procedures (Figures 7–18). None of these patients underwent

scalp reductions. Similar results were seen in three other patients for whom photographs were not available.

Discussion

Many men with long-standing Norwood Type VII alopecia lack sufficient donor hair to achieve acceptable cosmetic results from transplantation using only standard round grafts. These individuals have been treated with a variety of alternative techniques, which have included large hair-bearing flaps,² multiple scalp reductions, or combinations of these. In the past, there has existed a general consensus that these patients were not good candidates for hair transplantation.

Unger states that males with Norwood Type VII alopecia "should generally not have transplants."³ He does, however, cite exceptions. Individuals with laxed scalps may sometimes be considered candidates for scalp reductions and transplantation. Unger suggests that such patients are most suitably treated with quarter grafts and micrografts.

Norwood and Shiell state that those individuals with Norwood Type VII alopecia "should generally be rejected."¹ These authors also state that "these subjects can occasionally have hair transplants, but they should be advised of the severe limitation." An article by Norwood and Taylor⁴ addresses the problem of hair transplantation in males with severe alopecia and suggests various patterns of restoration. One salient feature of this report to note here is its declaration that complete restoration was not the transplant objective.

The scaling back of the complete restoration objective in hair transplantation in general is a realistic and welcome development. It has grown more prominent with the emergence of new techniques, notably incisional slit grafting, which operates on the scaled back principle and also produces a more natural appearance in the final result. The key principle behind incisional slit grafting is that no tissue is removed from the recipient site prior to transplantation. This approach, because it is more efficient and effective in the use of donor hair, is now allowing successful transplantation in a much broader range of alopecia patterns, eg, the diffuse alopecia of women, and the severe alopecia of Norwood Type VII class as reported in this article can now be included in the range of transplant-treatable alopecia patterns.

Although difficult to quantify, it has been repeatedly observed that the yield of growing hairs from grafts placed in incisional slit recipient sites is greater than that from traditional round grafts, perhaps by as much as a factor of 2. We believed that even very small round grafts, those approaching micrograft size, so long as they are placed in a recipient site prepared with a punch that re-

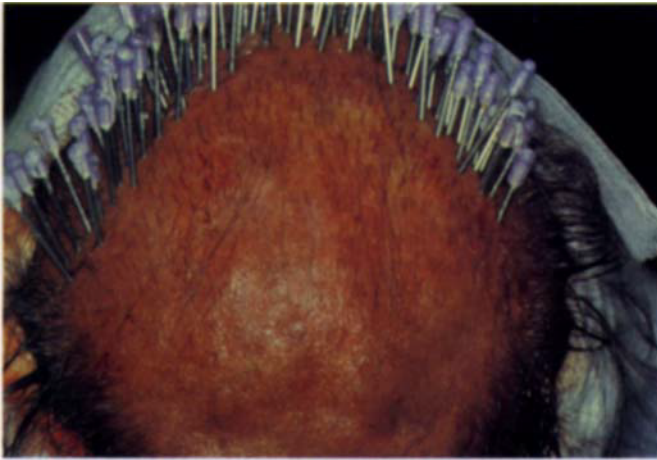


Figure 6. 18-gauge needles are inserted in front of the quarter grafts.



Figure 7. Patient number one. Before transplantation.

moves a plug of tissue, will suffer a relative loss of growth ability and a relative loss of yield as compared with the same volume of tissue containing the same number of hairs but placed in an incisional slit site from which no tissue has been removed.

Even without quantification, it seems obvious that this difference in yield must be related to the difference in the degree of vascular insult posed to the subcutaneous layer. Any interference with its interlocking network of arteries, veins, lymphatic vessels, and nerves represents a physiologic challenge that must be overcome before a new graft can be nourished. The interference generated by the removal of plugs of tissue, of any size whatsoever, enlarges

Figure 8. Patient number one. Note the radial pattern of the incisional slit recipient sites. The quarter grafts will be placed into these slits.

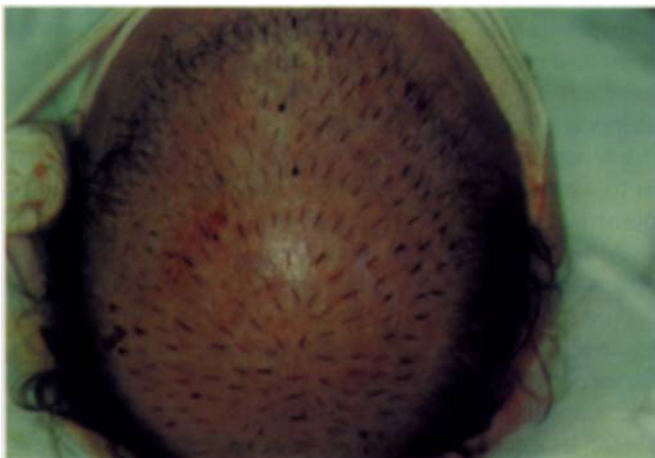


Figure 9. Patient number one. After four sessions and a total of 1,457 quarter grafts and 378 micrografts. No scalp reductions were utilized.

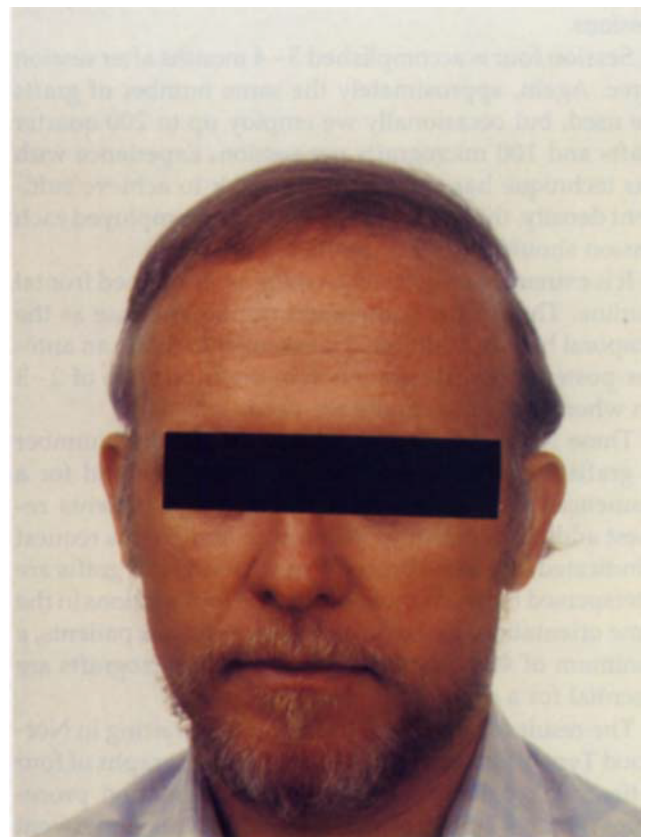




Figure 10. Patient number one. Note the purposeful ill-defined frontal hair zone.



Figure 11. A top view of patient number one after incisional slit grafting.

Figure 12. Patient number two. Before transplantation.

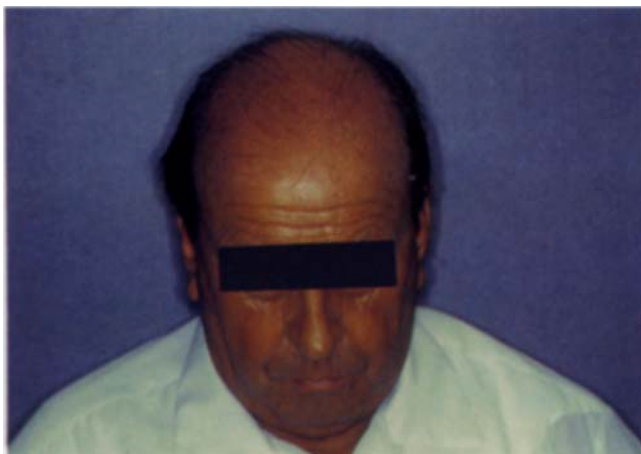


Figure 13. Patient number two. After transplantation and a total of 530 quarter grafts and 300 micrografts. No scalp reductions were utilized.





Figure 14. Patient number three. Before transplantation.



Figure 15. Patient number three. After transplantation and a total of 414 quarter grafts and 250 micrografts. No scalp reductions were utilized.



Figure 16. Patient number three. A top view after four sessions and no scalp reductions.

Figure 17. Patient number four prior to incisional slit grafting.

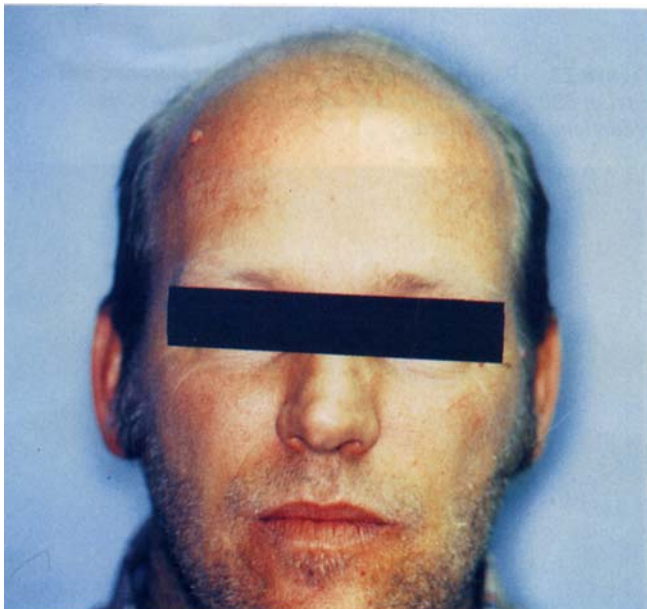
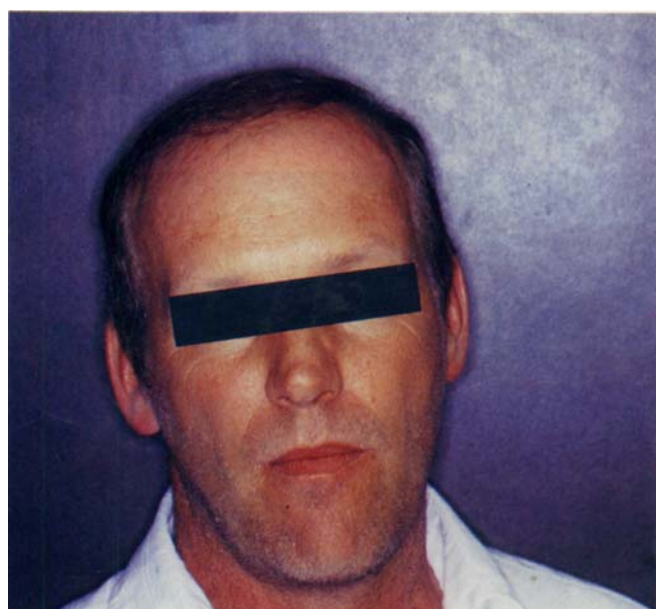


Figure 18. Patient number four after only two sessions and a total of 260 quarter grafts and 100 micrografts. Additional sessions are planned in the future.



the scope of the physiologic challenge to be overcome. On the other hand, a single stab incision followed by snug graft placement minimizes the challenge to the tissues and in all likelihood allows graft nourishment to begin immediately. Scarring is also minimized in incisional slit grafting and "donuting" is rarely seen.

The maximizing of yield that is inherent in incisional slit grafting allows the surgeon to make more efficient use of available donor hair.

Conclusion

The technique that has been described here provides a very practical and effective approach to the transplantation of individuals with advanced, Norwood Type VII, alopecia. This is especially useful in individuals who have poor hair quality. It can also be performed successfully without the adjunct of scalp reduction, and it can be completed in a minimum of four sessions.

We know of no other article that deals exclusively with the use of smaller grafts in which no recipient tissue is removed in transplanting patients with Norwood Type

VII male-pattern alopecia. By using the technique of incisional slit grafting, these patients can achieve quite acceptable cosmetic results. Our results have been rewarding and we have found that patients with long-standing, severe alopecia are very pleased with this approach. We have therefore coined the term incisional slit grafting to represent a technique in which no recipient tissue is removed and have illustrated its role in transplanting patients with Norwood Class VII male-pattern balding.

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