Hair transplanting: An important but often forgotten treatment for female pattern hair loss

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The techniques used in the early days of hair transplanting were not suitable for the treatment of a majority of women with pattern hair loss. For at least the last 10 years, changes in those techniques have resulted in a reversal of that situation. Today, many women with female pattern hair loss are suitable candidates for transplanting, however, this is not widely appreciated. This article provides potential explanations for this and demonstrates examples of the current methods. Hair transplanting should be considered as a potential treatment option for most women with pattern hair loss. (J Am Acad Dermatol 2003;49:853-60.)

More than 20 years ago, in the infancy of hair transplantation, the following was written about hair transplanting for women: "As a general rule, it is wise to reject anyone with less than 8 hairs per 4-mm round area (in the donor area). Female patients inquiring about hair transplanting for androgenetic thinning almost always fall into this group, as they tend to lose their hair diffusely rather than in the typical male pattern and therefore usually lack adequate donor sites (Rook et al, 1968). In addition, their objective is often thick hair rather than the usual 'early thinning' appearance transplanting produces."1

Later, Norwood2 wrote: "Hair transplants in diffuse patterned androgenetic alopecia and diffuse unpatterned androgenetic alopecia produce viable hairs in both men and women, but they are usually disappointing, particularly in women. The transplanted hair takes and grows similarly to that in the more common patterned types of androgenetic alopecia, but the operation causes a temporary and sometimes permanent loss of existing hair in the recipient area. . . . There are 2 reasons, in addition to the above limitations, to be careful of females: (1) One is that dense donor hair is very limited. . . . (2) The second reason is that women are frequently not satisfied with the less than normal hair density that grafts provide. . . ." The authors noted an "occasional and very limited exception" to the above advice, but even this "exceptional" woman could expect that a partial hairpiece would still be required.

The above statements were true at the time, mainly because of technique-related reasons that are described below. They were also frequently quoted and, therefore, had a profoundly negative effect on the way hair restoration surgeons (and dermatologists) viewed potential female patients. Hair transplanting has changed and our understanding of female pattern hair loss (FPHL) has evolved, so that for more than a decade the original statements have ceased to be true. However, they have remained widely accepted truths and hair transplantation is sometimes not even mentioned as a possible treatment in discussions of FPHL.3 Although not all women who have FPHL are candidates, most are now acceptable for the procedure.4-6

PATTERNS AND INCIDENCE

The 2 main peaks of onset of pattern hair loss in women occur in the third and fifth decades.5 Those
having earlier onsets tend to have more severe forms of loss develop and this should be borne in mind when a decision is made about offering hair transplanting to women in their late teens or twenties.

Three different patterns of hair loss have been identified and their incidence studied. Common to all 3 patterns is the frequent presence of small oval- or irregularly shaped lacunae of total alopecia in areas of more diffuse thinning (Fig 1). This was first noted by Unger in 1987. More recently, Olsen has reported similar lacunae of atrichia on women who she has examined. These findings have a consequence that will be elaborated on later.

Hamilton, and later Norwood, described a more or less male pattern of frontoparietal hair loss in women. Hamilton examined 214 women and recorded the frequency and severity of this type of patterned hair loss. He found that 79% of women after puberty had at least type II male pattern baldness (Fig 2). Type IV male pattern baldness occurred in 25% of women by the age of 50 years and 50% of women by the age of 60 years. No women in his study, at any age, had more than type IV baldness. More recently, Venning and Dawber examined 564 women over the age of 20 years. They reported that 13% of premenopausal women had Hamilton types
II to IV male pattern baldness whereas 37% of postmenopausal women had this degree of hair loss.

Venning and Dawber\(^{10}\) also documented the incidence of a Ludwig type pattern of hair loss in the 564 women they studied. In contrast to Hamilton,\(^{8}\) Ludwig\(^{11}\) described a caudal and centrifugal pattern of hair loss in these individuals, emphasizing the maintenance of the frontal fringe of hair. He arbitrarily divided this pattern of loss into 3 degrees of severity (Fig 3). In the study by Venning and Dawber,\(^{10}\) it was found that 87% of premenopausal women showed vaultal thinning of Ludwig pattern types I to III. As noted above, 13% also had Hamilton types II to IV. Thus, 100% of women over the age of 20 years had at least some form of FPHL in their opinion. Postmenopausal women showed an increased tendency to a more male pattern of hair loss, with 63% (195 of 310) showing Ludwig types I to III, and 37% showing Hamilton types II to IV.

Olsen has described a third Christmas tree or frontal accentuation pattern of loss, characterized in its early stages by only a slightly widened part, which eventually can involve a broad area of the frontal hairline and the midline (Fig 4).\(^{3}\) In a series of 96 women with obvious but not severe patterned alopecia, she found that more than 70% of the patients presented with this pattern of hair loss,\(^{12}\) and believes it is present more often in her patients than the pattern described by Ludwig.\(^{11}\) We tend to agree with her opinion on the relative frequency of these patterns but this is not based on a careful tabulation of our patients.

In a different study, Norwood\(^{13}\) has reported that only 190 of 1006 women he examined had what he would consider female pattern alopecia. Although he thought that it was quite common (reaching almost 30% in women more than 30 years of age) his study reported a considerably lower percentage than either Hamilton\(^{8}\) or Venning and Dawber.\(^{10}\) The reason for this is unclear. Whatever the true incidence of FPHL in women, it appears to be increasing. This may be because of an actual increase in the occurrence of FPHL or an increased readiness to seek help for cosmetic problems.

WHICH WOMEN ARE CANDIDATES FOR HAIR TRANSPANTING?

Before beginning any hair transplant operation, if there are any suspicious signs or symptoms, a full medical workup should be pursued to rule out any cause for alopecia that could be treated medically. The recommended endocrine blood tests are well documented elsewhere,\(^{3}\) as are the dermatologic conditions that can cause both temporary and permanent hair loss. In particular, the physician should be certain that this is not temporary hair loss secondary to emotional or physical stress, such as preceding acute febrile illness, crash dieting, surgical procedures, childbirth, or any other event that may lead to only transitory hair loss. As with men, deciding whether a female patient is a candidate for hair transplanting depends, most importantly, on whether or not: (1) there is a good long-term potential donor/recipient area ratio; and (2) the patient has realistic expectations. With regard to the former, in all 3 patterns of hair loss described above, any one or all of the temporal, parietal, and occipital areas may contain sparse hair or may, in the opinion of the surgeon, be destined to eventually be effected by the thinning process. Therefore, they may or may not be suitable as donor areas for hair transplanting.

As noted earlier, however, most of the female patients who we currently see—rather fortunately—have large enough potential donor areas to at least carry out 1 to 3 hair transplant sessions of 800 to 1200 grafts each; we believe this will continue to be the case. Information pertinent to this parameter includes family history, medical history, and age. Of course, the sparser the hair in the donor area, the fewer the hairs that will be available to thicken the recipient area. However, as will be discussed below, even a less than dense donor area can often be used to produce at least some thickening of strategic areas of the recipient area. The only requirement is that whatever improvement is achieved should be thought by the patient to be worthwhile in relation to the inconvenience, discomfort, and cost of the procedure.

This brings us to the second major factor affecting the candidacy of patients, namely, their objectives. For a minority of women, anything less than dense hair is unacceptable. Although such results are sometimes possible in women (Fig 5), in most cases
a more realistic goal is a significant increase in hair density. Patients who cannot be satisfied with significant improvement without guarantees of dense results are better left untreated. Having noted this, the majority of women we currently see in consultation express very realistic goals. Most are willing to accept a significant degree of thickening if that is all that is possible. They generally have exhausted all the proposed medical and cosmetic solutions without satisfaction and hair transplantation is the only option left to them that is certain to produce a positive outcome—even if it doesn’t produce as much improvement as they would prefer.

**TECHNIQUE AND DISCUSSION**

Generally, the technique used for hair transplanting in women is similar to that used in men. It is beyond the scope of this article to discuss such techniques in detail but good sources are available.\(^6\)\(^{14-17}\) Because their body mass is usually lower than that of men, local anesthetic solutions are injected more superficially, slowly, and intermittently compared with men, to avoid anesthetic toxicity.

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**Fig 4.** Christmas tree pattern of hair loss or frontal accentuation involving broad area of frontal hairline and midline has been described by Olsen.\(^5\) In this patient, virtually all of frontal hairline hair has been lost with thinning hair narrowing as it extends posteriorly (A); after 2 sessions of hair transplanting (B). Generally, the less contrast between color of hair and skin, the thicker hair appears. If patient had left her hair colored blond instead of darkening it, results would have been even more impressive.

**Fig 5.** A, Patient before hair transplanting. *Black line* denotes limits of proposed pattern of transplanting. B, Nine months after single session of hair transplanting. Remarkable result in single session is not typical. In most cases, more realistic goal is significant increase in hair density but not hair that appears to be as dense as shown.

**Fig 6.** Donor area 6 months after operation. Only narrow, difficult to find, scar line is present. Scar will be excised as part of any subsequent harvest so that no matter how many times a donor strip is obtained, only single scar will be present.
The donor area is chosen on the basis of the texture and density of the hair in the various areas, and the effect the donor scar will have on future hairstyling objectives. In women, the donor area is never extended into the temporal areas as is often done in men. This is because temporal hair nearly always is, or will become, sparser with the passage of time. Relatively full temporal areas are also cosmetically more important in women than in men, so harvesting that area is unwise. In addition, the inferior occipital and parietal areas are never harvested, as even fine scars in those areas might limit hairstyling options—eg, sweeping the nape hair up toward the top of the head. As a result of the preceding limitations, women tend to have fewer grafts available for transplanting and objectives must be tailored to accommodate this (as will be discussed below). Only a single, very-fine scar is produced as a strip is removed and the donor site is sutured (Fig 6). In subsequent sessions, this scar is excised as part of the new harvest. Thus, regardless of the number of sessions carried out, only 1 donor scar is ever created and there is no cosmetically significant thinning in the donor area. This is in contrast to the multiple rows of scars produced with the harvesting techniques that were in general use until approximately 10 years ago.

In the recipient area, the types of grafts used are primarily the follicular unit (FU) and small slit grafts that contain 2 FU, one behind the other (Fig 6). In some exit individually or in groups of 4 or 5. Small grouping of hairs are referred to as follicular units (FU). Micrografts consist of single FU and small slit grafts contain 2 FU, one behind the other.

Fig 7. Close-up view of scalp with hair clipped short. Most hairs exit scalp in small groups of 2 or 3, although some exit individually or in groups of 4 or 5. Small grouping of hairs are referred to as follicular units (FU). Micrografts consist of single FU and small slit grafts contain 2 FU, one behind the other.

When one uses the above techniques, existing hair is neither injured nor removed from the recipient area, regardless of what type of recipient site is being made. This is a major reason why hair transplanting is a possibility for more women today than it was 20 years ago. Before the development of FU transplanting and slit grafting, only round grafts were used. Donor tissue was produced by round punches and the grafts were placed into round holes made by marginally smaller trephines. Making the recipient sites inevitably resulted in the removal of some hair that would not have been otherwise lost as the pattern loss progressed; and (3) the net gain in hair was only equal to the difference
in the number of hairs removed and the number contained in the graft. For example, if 6 hairs were lost as the recipient site hole was prepared, and the graft contained 14 hairs, the net gain was only 8 hairs, and some of the limited number of permanent recipient area hairs had been excised in the process. In contrast, using today’s techniques, FU and slit grafts can be placed between existing hairs in a thinning area. None of the original hair is removed and the increase in hair density is equal to the total amount of hair transplanted, ie, in the example above, 14 hairs.

A second and equally important reason why hair transplanting is a feasible treatment option for women with FPHL today is that, as noted earlier, no matter how many sessions are carried out, only a single scar is produced in the donor area. When the donor area is harvested properly, it is usually so
fine a scar that it is hard to find, even when one looks for it. Thus, hair is added to the recipient area at no apparent cost to the hair density in the donor area. There is, of course, a slight decrease in hair density in the donor area as the skin is stretched slightly to close the donor wound, but one is rarely able to actually notice any decreased density.

Limitations and problems

Most female patients require only 1 or 2 sessions in an area of thinning, eg, the frontal, frontotemporal, or both areas. This, however, is obviously dependent on the presenting degree of hair loss and the patient’s density objectives (Figs 8 to 10). A minority of patients will ask for 3 sessions. In addition, it is usually wise to keep some donor hair in reserve for possible future hair loss in the same or other areas. Commonly, there are inadequate amounts of donor hair to treat all the thinning areas that are present or are likely to develop with the passage of time. In such cases, priorities are given to some areas such as the hairline zone, part line, or central vertex. The thickened hair from these areas can subsequently also be styled to camouflage other untreated areas. Once again, most patients who are obligated to make these choices consider some improvement better than none.

Postoperatively, many women experience a temporary loss of some hair adjacent to the donor area and some existing hair in the recipient area. As incisions are made in both areas, the blood supply to the remaining hair at those sites is decreased. The result is that 10% to 20% of hairs in these areas may fall out, regrowing approximately 3 months later. Although such hair loss occurs in approximately 10% to 20% of the men in our practice, women seem to be significantly more susceptible to it, with 25% to 50% of female patients experiencing temporary loss. We always stress this possibility to them, as it is, in our opinion, the worst “price” women may have to pay for undertaking a hair transplant. The more densely the grafts are transplanted, of course, the greater the vascular compromise and the more likely temporary hair loss will occur. Dense packing of FU, for example, is an invitation to this phenomenon and, in general, it should be avoided. It is, however, important to emphasize not only the possibility of some hair loss occurring but also its temporary nature. The authors have found that these effects can also sometimes be prevented—and nearly always are mitigated—by the use of a topical minoxidil solution applied twice daily to the recipient and potential donor areas for 1 week before and 5 weeks after operation. Two recent articles have lent support to this practice.18,19 Topical minoxidil produces vaso-dilation of intact blood vessels in the areas and this may compensate for the decrease in circulation secondary to the severed ones. The preoperative use of topical minoxidil in our practice has not been found to significantly alter bleeding during the surgical procedure.

Because some temporary hair loss nevertheless remains a possibility, it is generally most ideal to begin transplanting before the recipient area hair is very sparse. If there is moderate hair density still present at the onset of treatment, it is more likely that any temporary hair loss can be camouflaged by the remaining hair. For those with more sparse hair, another alternative is to transplant only the left or right side of the recipient area, leaving the untreated side to comb over the treated one if any significant hair loss occurs. The untreated side could be transplanted in a second session or one can carry out a
second transplant in the area that was previously thickened if that was thought to be advantageous.

CONCLUSION

For women with FPHL who have had little success from medical treatment, the possibility of hair transplanting should not be ruled out. Many women can expect results that are at least as good as those seen in transplanting for men with early male pattern hair loss. Hopefully, this article will help to make this option more widely recognized.

REFERENCES