

Hair Restoration Complications: An Approach to the Unnatural-Appearing Hair Transplant

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ABSTRACT

Hair restoration surgery has emerged as a leading technique for rejuvenation of the upper third of the face. Using contemporary techniques, the results are generally indistinguishable from the appearance of native scalp hair. Unfortunately, older techniques of hair transplantation did not produce this quality result. As a result, there are a considerable number of patients who bear the visual and psychological burden of older hair transplant techniques. In addition, there are regrettably additional patients who have similar unnatural hair transplant results from poorly performed procedures completed in recent time. Understanding the anatomic problems associated with the unnatural-appearing hair transplant is fundamental to the successful correction of the deformity. The most common problems associated with the unsatisfactory hair transplant seen in clinical practice are reviewed, and possible approaches to treatment are presented. The challenge for the hair restoration surgeon is to provide a level of expertise and honesty to these unfortunate patients to restore their appearance and self-confidence. Fortunately, a tremendous benefit for the patient can be achieved when a correction of the unsightly transplant is performed.

KEYWORDS: Hair plugs, corn row transplant progressive hair loss, donor-site scarring, corrective hair transplant

As with any surgical specialty, complications in hair restoration surgery occur as an unfortunate consequence of performing the operation. Fortunately, hair restoration surgery has the lowest complication rate of all cosmetic surgical procedures performed in the author's cosmetic surgical practice over the past 18 years. The scope of this article limits the detailed description and full analysis of all possible complications in this field. Problems such as infection, bleeding, poor growth, and cysts occur to varying degrees, and these untoward events and others have been listed and discussed in numerous reports and book chapters.^{1,2} The focus of this article is to provide a useful review of the most common problems in hair restoration surgery that the practitioner is likely

to see in practice and outline a practical approach to managing these unfortunate cosmetic deformities. Other reports have outlined options for management of the unnatural-appearing hair transplant, and the current article represents the author's refinement of earlier published articles on the same topic.³⁻⁸

The single most frequent problem seen in hair restoration surgery today remains the unsightly appearance of plugs or clumped grafts that appear very unnatural. Wide scars in the donor area, a poorly designed hairline, and a surgical plan that has failed to consider the progressive nature of hair loss in a young patient comprise the other most frequently seen problems in hair restoration surgery today.

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UNSIGHTLY APPEARANCE OF PLUGS

The fundamental problem with the unnatural-appearing hair graft is the size of the graft. Thus, the fundamental solution is simply to reduce or remove it. The first person to describe this technique was Lucas.⁹ The original description was to partially excise the plugs using a 1.5- to 1.7-mm punch biopsy instrument. Our current technique is to employ a punch that is ~0.5 mm smaller than the estimated size of the unsightly plug or clumped graft. Thus, if 4-mm plugs are being addressed, a 3.5- to 3.7-mm punch would typically be chosen for plug reduction. The reason for this is to remove up to 90% of the plug hairs and leave behind a few hairs that will look soft and natural. The plugs to be reduced are trimmed to ~3-mm length, and the punch positioning for hair removal is performed eccentrically to leave a crescent or sliver of the remaining original plug. This effectively leaves behind a linear graft of ~3 to 4 hairs. We have found that using smaller punches and being less aggressive with the plugs often results in an incomplete plug softening with a resulting need for revision of the original plug reduction at a later date (Fig. 1). Our concept is to be as aggressive as possible with removing plugs to obtain the best improvement in a single procedure. Care must be taken, however, to assess the local blood supply in the face of a previously scarred and operated scalp and always limit plug reduction and subsequent grafting in the immediate area to an appropriate degree based on clinical judgment and local tissue perfusion.

The hair recycled from the removed plugs as well as additional hair harvested from the occipital region is densely transplanted anterior and posterior to the plug reduction sites. In the majority of cases, the plug reduction sites are not sutured closed. This represents a change from the author's earlier reported technique.³ Suturing

the sites reduces the local blood flow and increases scalp tension thereby reducing the success of graft growth in the vicinity of the plug reduction sites. This location is precisely where we want to maximize growth of newly grafted hair. However, suturing the sites does make general wound care easier for the patient in the first few days of healing and immediately postoperatively. If grafting is not performed in areas of plug reduction, suturing of the site with an absorbable suture (i.e., chromic) is always performed.

Usually there are several wide tracks of alopecia that exist between the linear rows of plugs, which need to be densely transplanted. Plugs that exist more than 2.5 to 3 cm posterior to the anterior hairline can often be left intact. Aggressive management of the first two or three rows of plugs as described is usually all that is necessary to soften and naturalize the hairline and camouflage the more posteriorly positioned plugs. This approach blends the soft look of the anterior hairline zone with the higher density of the plugs posteriorly. In many cases, the posterior row of plugs are also reduced in the crown, and additional grafting is needed in the vertex to create a natural "posterior hairline" as well. Obviously, each patient's distribution of problem plugs is unique; however, the final surgical plan is to create a zone of natural-appearing hair at the leading edges, anteriorly as well as posteriorly, and take advantage of the centrally located, and camouflaged, higher density plugs. In some situations, however, the patient may prefer to soften all plugs previously grafted.

When removing the plug, it is important to angle the punch parallel to the follicles. Reducing the number of transected hairs in the resected plug maximizes the recycling yield. In addition, care should be taken to pass the punch instrument deep enough to include 1 to 2 mm of subpapillary fat. Including the entire papilla and its

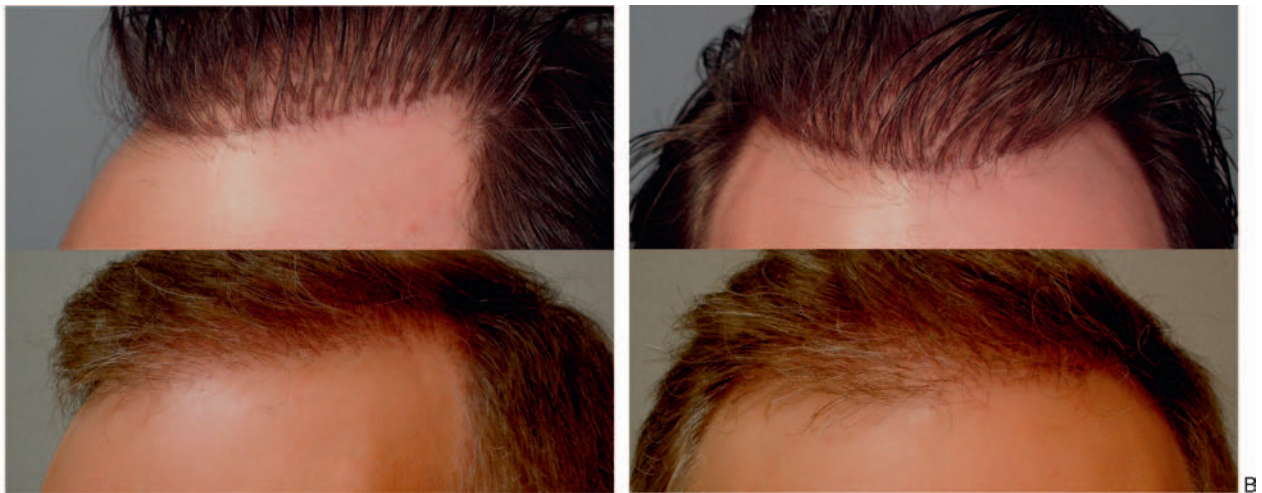


Figure 1 (A) Results from another practice showing failure of small grafts alone to camouflage the "cornrow" appearance of a previous hair transplant using 4-mm plugs. (B) Results showing improved outcome when a direct and aggressive removal of the plugs is incorporated into the plan.

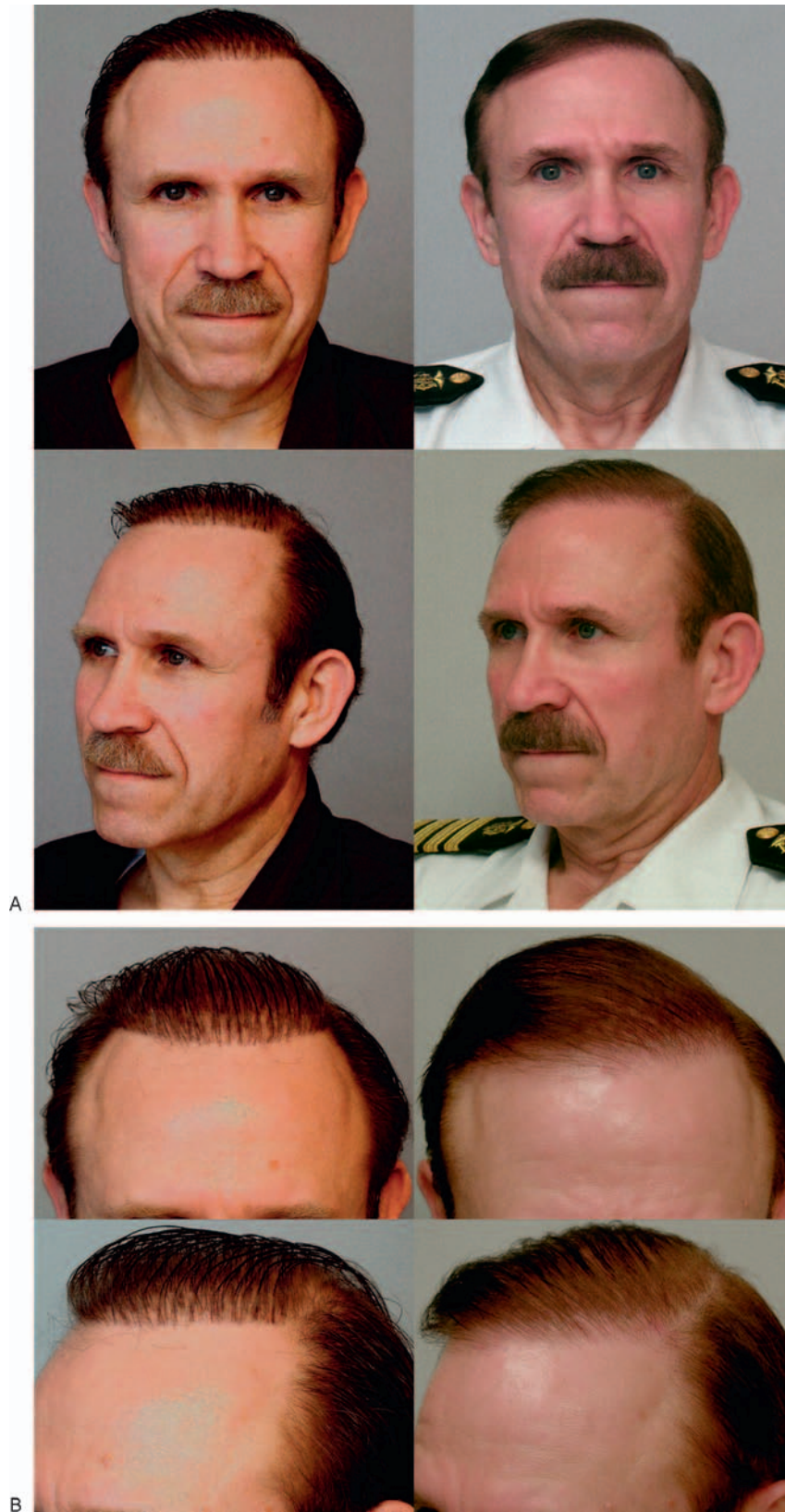


Figure 2 (A, B) This man had previously undergone a hair transplant using 4-mm plugs. He underwent two hair transplant sessions including 62 plug reductions and recycling and a total of 2000 follicular unit hair grafts. Each session was separated by 8 months. Several facial moles were also removed.

underlying fat accomplishes two goals. First, removal of the entire plug papilla increases the likelihood of “no regrowth” of the original in situ hair. Second, sufficient fat below the intact hair follicle helps to maintain viability of the grafts as they are trimmed and recycled. The use of sharp excision punches and frequent exchange of a punch when it becomes dull is also an important technical point to minimize shearing and damage to the peripheral plug follicles.

Two or three sessions of plug reduction are usually needed to adequately convert the hair transplant appearance from unnatural to “natural enough” for most patients’ satisfaction. In general, we prefer to wait for 8 months after the first corrective transplant to assess the results and proceed to the next staged repair (Fig. 2).

Sometimes, a “faster track” approach can be employed, and additional plug reduction and grafting can be performed within a shorter time interval (Fig. 3). The advantage of the “faster track” is a completed result sooner. The disadvantage is not having a complete picture of the healed first stage to formulate the second-stage plan. Regardless of the timing between surgeries, the importance of preoperative discussion and a review of goals and expectations with the patient before undertaking a corrective transplant cannot be overstated. Establishment of mutual trust, an appreciation for anticipated progressive hair loss, and improvement from plug reduction are essential to achieving a successful outcome. In addition, the nature of residual scarring from previous hair transplants and the ability of the



Figure 3 (A) Upper left is the preoperative view; upper right is the view after 45 plug reductions and 1500 follicular unit grafts; lower left is the view 6 weeks later and an additional 40 plug reductions and 1000 follicular unit grafts; lower right is the view 9 months after the initial procedure.



Figure 3 (Continued) (B, C) Preoperative views and results 9 months after a “fast-track” approach. Note that the plug reduction sites are not closed to promote better graft survival.

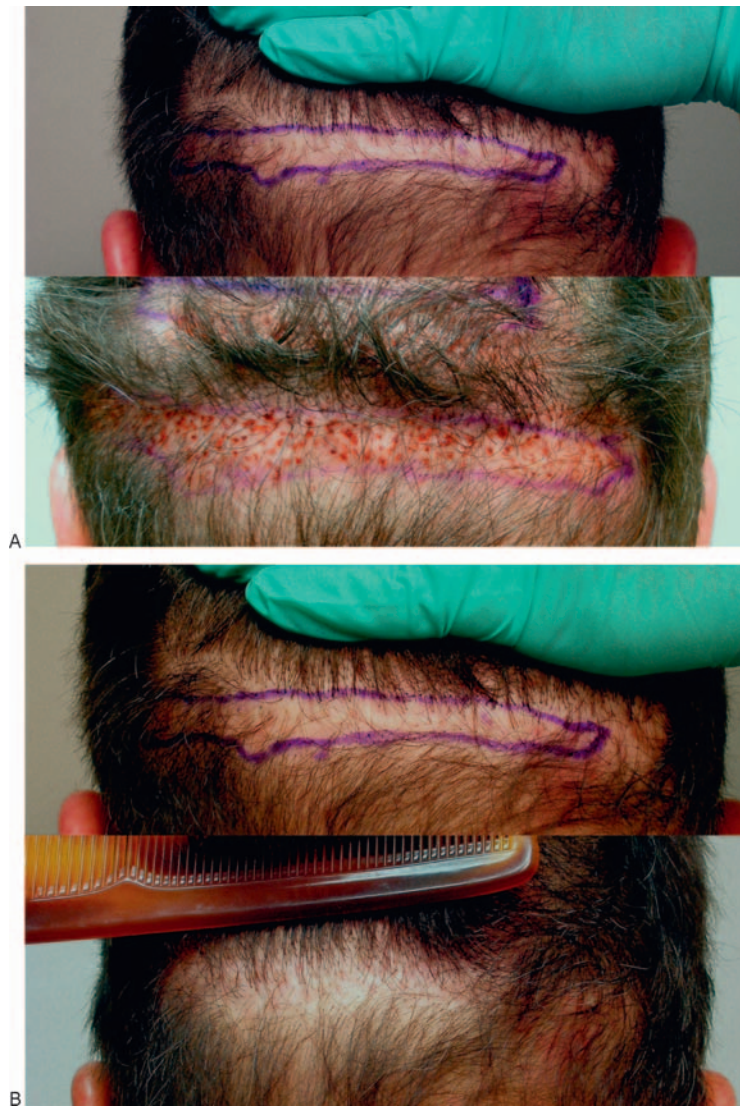


Figure 4 (A) Wide donor scar and single session of 250 follicular unit grafts. (B) Results at 8 months.

newly transplanted hair to camouflage open spaces and any remaining plugs must be thoroughly reviewed and appreciated by the patient preoperatively.

WIDE DONOR SCARS

Donor-site scarring follows all hair transplants. The scars can range from imperceptible to extremely deforming. If sufficient and unusually lax occipital scalp is present, direct excision of the widened scar with layered

or trichophytic closure can be performed. This case scenario is very uncommon, however. More commonly, a broad and unsatisfactory donor-site scar is present because excessive scalp has been removed during harvest and excessive tension on the wound closure has resulted in a wide scar. In the past, the author has used a W-plasty scar revision and other approaches utilizing local tissue rearrangement and mobilization.⁴ Unfortunately, these approaches have usually fallen short of the desired goal.



Figure 5 (A, B) A 42-year-old man who underwent right temporoparietal scalp flap at age 22. His hairline is too low, the temporal angles are blunted, the direction of hair growth is incorrect, visible plugs are evident behind the flap, and progressive hair loss is conspicuous behind the flap as well. (C) The flap is excised and recycled into grafts that are immediately used for hairline restoration anterior and posterior to the flap excision suture line. No additional occipital donor harvest performed. (D) A second session performed 8 months later consisting of plug reduction and recycling and occipital harvest for 1800 graft session.



Figure 5 (Continued) (E, F, G, H) Preoperative views and postoperative results 8 months after the second procedure. Note the improved bilateral temporal recession.



Figure 6 (A) Abnormal hairline due to grafts placed too low with blunting of temporal recession. Blue dashes indicate location of incision for elevation of hairline, and arrows specify the angle of hairline rotation to re-create acceptable temporal points. (B) Intraoperative view with recycled grafts in place as well.



Figure 6 (Continued) (C, D) Preoperative views and postoperative results at 1 year after the initial depicted procedure and a subsequent transplant session with a total of 2200 grafts.



Figure 7 Bizarre appearance of plugs placed where alopecia existed 18 years earlier. Progressive hair loss has developed surrounding the areas of previous plug grafting.

It does not make sense that removal of additional scalp and retightening of an already tissue-deficient area will solve the problem of scar widening. Thus, logic and sound surgical principles dictate that tissue expansion or grafting into the wide donor scar are the two best options for managing the wide donor scar (Fig. 4).

POORLY DESIGNED HAIRLINE

Common hairline design problems include blunting of the temporal angles, lack of symmetry, and a hairline that is positioned too low on the forehead. Surgical excision, redesign, and elevation of the hairline are usually necessary to correct these problems. In most cases, the hairline can be redesigned in a single surgical session, and hair grafts can be incorporated into the surgical plan as part of a comprehensive approach to correction (Fig. 5). However, as stated above with regard to plug correction, a second and not infrequent third hair transplant session is often necessary to complete the correction of the poorly designed hairline (Fig. 6).

PROGRESSIVE NATURE OF HAIR LOSS

Supply and demand is a central theme in many aspects of our lives and is critical to understanding what can and cannot be achieved regarding surface coverage of the scalp. A variety of unsightly and outlandish appearances have resulted in years subsequent to the performance of a transplant in individuals who have undergone progressive hair loss after the initial hair restoration procedure (Figs. 5 and 7). The appearance of these patients illustrates the devastating outcome that can occur when there is disregard and inattention to the progressive nature of

hair loss. Establishing a hair transplant plan for the young patient that is conservative and does not commit more donor supply to an ever enlarging area of demand (i.e., progressive hair loss) is essential. This approach and adjunctive medical therapy to reduce hair loss are the key factors to avoid the illustrated deformities.

When the surgeon is faced with correcting these types of problems, creativity, long-range surgical planning, and a variety of techniques described above are employed. The exact techniques used in an individual patient will be as varied as the presenting problems themselves.

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