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Not Your Father's Hair Transplant

Better techniques have made it possible to achieve a more a natural look

BY SHELLY A. FRIEDMAN, D.O., F.A.O.C.D.

To appreciate today's hair transplant, one must realize how far we have travelled over the past 50 years. When Norman Orentreich, M.D., first introduced hair transplantation in the 1950s he was more interested in getting hair to grow in its new site rather than with cosmetic appearance. The first hair transplants used a 4 mm round punch that removed the hair and the surrounding tissue (Figure A). These "plugs" were removed with a cylindrical punch either manually or with an electric drill and allowed to heal secondarily with a white, round scar.

The "plugs" were then placed back into the scalp after a 3.5 mm punch removed the bald skin (Figure B). The bald skin was discarded and the "plugs" inserted into the new site. The typical "plug" had approximately 15-25 permanent or terminal hairs. To ensure an adequate blood supply in the recipient region, the plugs needed to be spaced one plug width apart (4 mm), creating a checkerboard effect. Four surgeries were required to fill in the entire transplanted area.

In 1984, Wayne Bradshaw, M.D., a hair transplant surgeon in Australia, described a new approach to hair transplantation whereby a 4 mm plug is either bisected or quadrisected. Instead of

HAIR, see page 10 >>

Rhinoplasty Improves Facial Symmetry

Subtle changes in nasal symmetry after rhinoplasty leads to substantial improvement in the overall perception of the face as symmetrical, according to British researchers.

> Findings suggest that achieving better and more subtle nasal symmetry after rhinoplasty leads to considerable improvement in the overall perception of the face as symmetrical.

That conclusion is based on analyses of photographs of 100 patients taken before and six months after rhinoplasty.

Midline-to-ala symmetry increased from a mean of 91.1% before surgery to 93.8% afterwards, according to researchers. They did not find any significant changes in other facial proportions.

"The degree of change from midline-to-ala symmetry was the only objective measure that was significantly associated with the subjective perception of

RHINOPLASTY, see page 9 >>

Skin Needling Effective For Acne Scars

The technique works by promoting collagen growth immediately under the epidermis

Skin needling is an effective method of improving acne scars, according to Italian researchers.

The technique involves puncturing the skin numerous times with small needles to achieve percutaneous collagen induction. Gabriella Fabbrocini, M.D., of the University of Naples Federico II, and colleagues tested this approach in 32 patients with acne rolling scars. The researchers used a needling tool (Dermaroller, Horst Liebl CEO) consisting of a rolling barrel 10 mm wide equipped with 96 microneedles—each 1.5 mm long and 0.25 mm in diameter—in four rows. Subjects underwent two treatment sessions spaced eight weeks apart.

Clinicians rolled the needling tool over areas affected by acne scars four times in four different directions: horizontally, vertically, and diagonally right and left. This was done to ensure an even pricking pattern resulting in about 250-300 pricks/cm^2. The needles penetrated scar tissue to a depth of 0.1-1.3 mm, depending on the applied pressure.

"The microneedles penetrate through the epidermis but do not remove it; the epidermis is only punctured and heals rapidly," the authors explained in *Clinical and Experimental Dermatology* (2009; published online ahead of print). "The needles seem to separate the cells from each other rather than cut through them, and thus many cells are spared."

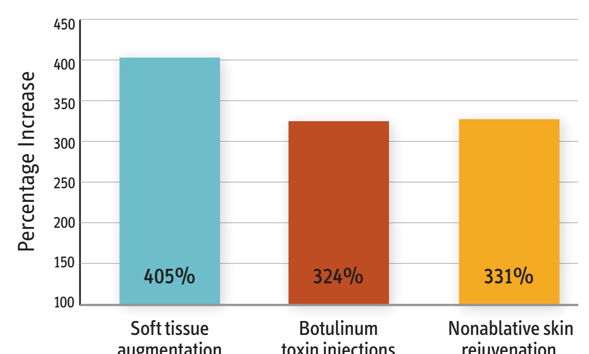
Prior to the first treatment, one

NEEDLING, see page 8 >>

BY THE NUMBERS — Big Gains in Cosmetic Procedures

The number of cosmetic and noncosmetic procedures performed by dermatologic surgeons rose by 120% from 2001 to 2007, with cosmetic procedures showing the biggest increases, according to an analysis of data from American Society of Dermatologic Surgery member surveys. Shown below are the procedures with the greatest percentage increases during the eight-year period.

Source: Data from Tierney EP, Hanke CW. Recent Trends in Cosmetic and Surgical Procedure Volumes in Dermatologic Surgery. Dermatol Surg. 2009; published online ahead of print.



COVER STORY

Hair transplant results have improved significantly over the years

>> HAIR continued from page 1

removing bald tissue in the recipient region, a blade is used to create a thin slit within the tissue. This new type of plug was called a minigraft. The term "plug" was then abandoned in hair transplant circles.

Emanuel Marritt, M.D., improved on Dr. Bradshaw's technique by cutting one or two hairs from the minigraft. He called this tissue a micrograft. The micrograft was inserted into the skin after piercing the skin with a large-bore (18 gauge) needle. As time went by, the harvesting of grafts with punches gave way to cutting an elliptical strip of skin that was closed by suturing the wound.

Figure A

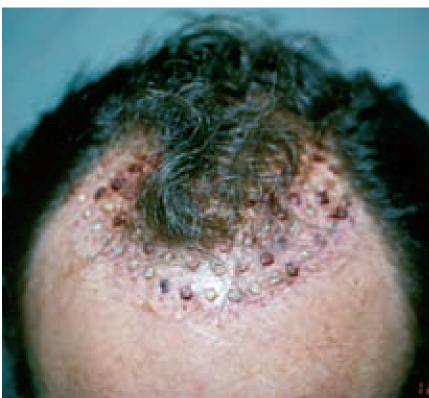


Figure B

In the 1990s, Bobby Limmer, M.D., further advanced the field of hair transplantation by noting that hairs grow in discrete groupings of one to four and sometimes five. The term follicular unit was used to describe one, two, three, four, and, rarely, five terminal or mature hairs with a discrete nerve and blood vessel supply, a connective tissue sheath, sebaceous gland, and an erector pili muscle (Figure C). Dr. Limmer used a high powered binocular microscope to dissect the donor tissue into the natural hair grouping follicular units with the least follicular loss possible. Dr. Limmer believed that a natural hair transplant could be achieved by duplicating nature's follicular units, rather than separating the units or bundling the units into groups. Follicular groups are composed of at least two or more follicular units.

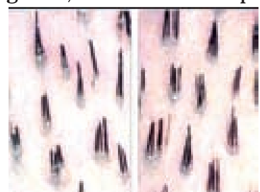
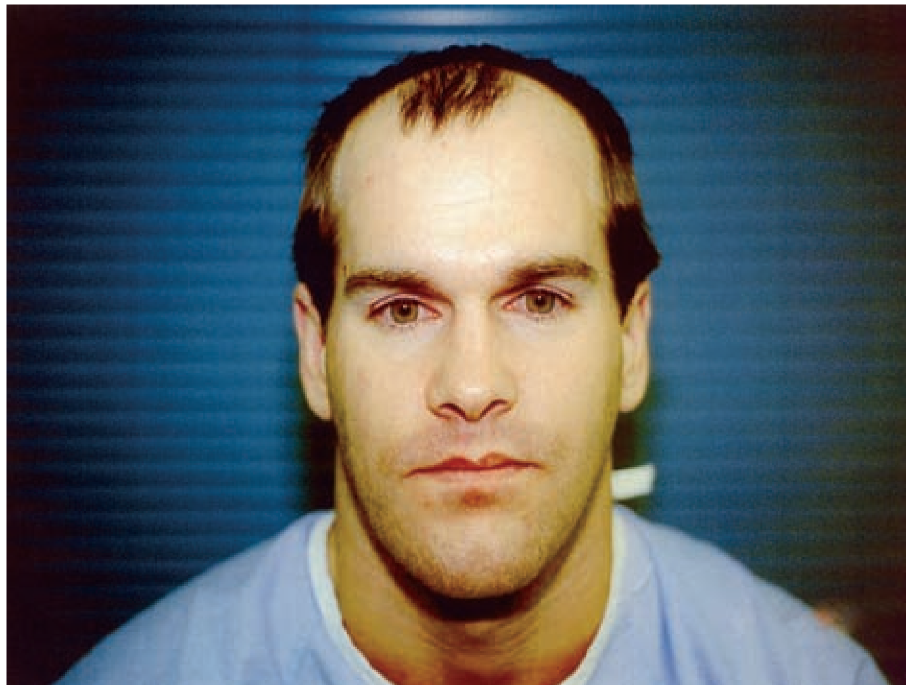


Figure C



Above: The same patient shown on page 1 before his hair transplant.

Today, donor hair is harvested by excising a narrow elliptical strip of tissue from the back of the scalp, where the follicles are resistant to hair loss (Figure D). Using stereoscopic microscopes, donor strips are then slivered or divided into very fine scalp sections approximately 2 mm thick. The slivers are then dissected into individual follicular units using the stereoscopic microscope (Figure E).

Figure D

Figure E

The microscope is more efficient than magnifying loupes in enabling clinicians to keep follicular units intact, resulting in less follicular transection. This process yields a higher number of intact follicular unit grafts from the available limited donor hair.

Once the follicular unit grafts have been meticulously prepared, a micrometer is used to measure the width of the hair shaft's diameter (Figure F). The length of the follicular unit graft is also measured to allow us to determine how deep the recipient site should be to accommodate the graft.

After determining the width of the graft, custom-made chisel blades are cut to match the graft width exactly. The length of the graft is then measured and the graft is carefully placed in a blade holder to match the length exactly. This duplicates nature and assures a better cosmetic outcome because each patient's grafts are a different length.

By preparing recipient sites with custom blades, we are able to place the grafts closer together and reduce the possibility of vascular injury or trauma. Compared with the 4 mm punch, the typical chisel blade for a one hair follicular unit is 0.7 mm in diameter. The two-hair and three-hair follicular unit grafts usually measure 0.9-1.1 mm in diameter.

Many patients can achieve the density and coverage they desire in one surgery, not the multiple surgeries required in the past.

CHISEL BLADES VS. PUNCHES

We choose to produce custom-made chisel blades rather than the alternative sharp or spear point blades. The chisel blade produces a linear incision on the skin surface and a rectangular shape beneath the skin surface. This allows an incision at right angles to the direction of hair growth. The spear point blades result in deeper incisions that could compromise or traumatize the vascular blood supply to the recipient region. The chisel blade allows us to densely pack the follicular unit grafts for better optical density.

Once the donor tissue has been removed, the skin is sutured using a technique called the Trichophytic Closure. This technique involves trimming the upper edge of the incision and then closing the wound so the hair near the edge that was trimmed can grow through the scar. This technique has been found to reduce the visibility of the scar and better camouflage the donor region (Figure G).

LATERAL SLIT TECHNIQUE

Since the advent of minigrafts, hair transplant surgeons have made recipient slit sites parallel to the direction of hair growth. Hairs in the donor region are naturally arranged next to each other in a plane perpendicular to the direction of hair growth (Figure H). Placing the follicular unit grafts in a parallel or sagittal position creates unnaturalness and reduces optical density. Making the recipient slits perpendicular to the direction of hair growth duplicates nature and returns hair to the same distribution and alignment as in the donor region. This process is called the lateral slit technique. Advantages of this technique include:

• More precise angulation of the slits, especially over the sideburns, posterior scalp, and the lateral fringes.
• Reduced injury to the scalp blood vessels due to a shallower recipient site.
• Less graft popping because the force of incision is downward and upward, allowing free transmission of pressure to the outer surface of the scalp. This results in little to no pressure being applied to adjacent grafts.
• Better optical density because follicles lie side by side instead of being lined up behind one another. This gives the hair a thicker more natural appearance. The same number of grafts placed in a lateral or coronal angled slit visually makes the transplanted hair appear more dense and thicker than the parallel or sagittal angled slits.

DENSE PACKING

The same number of follicular unit grafts or hairs placed over the same recipient area can appear totally different. The appearance of density is *not* only dependent on the number of grafts, but also on hair color, quality, and texture. Contrast between hair color and scalp color is an important

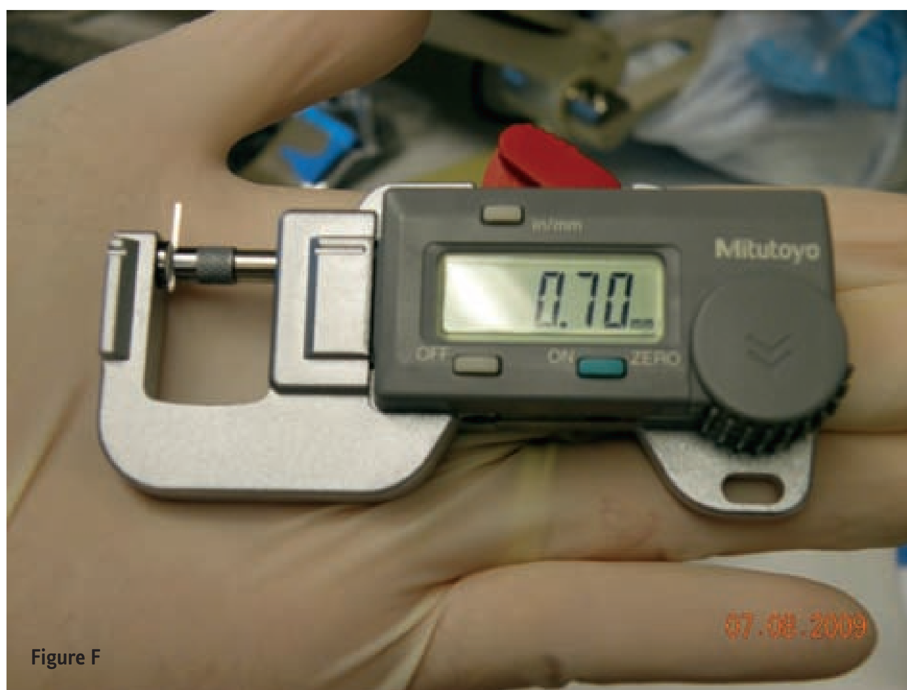


Figure F

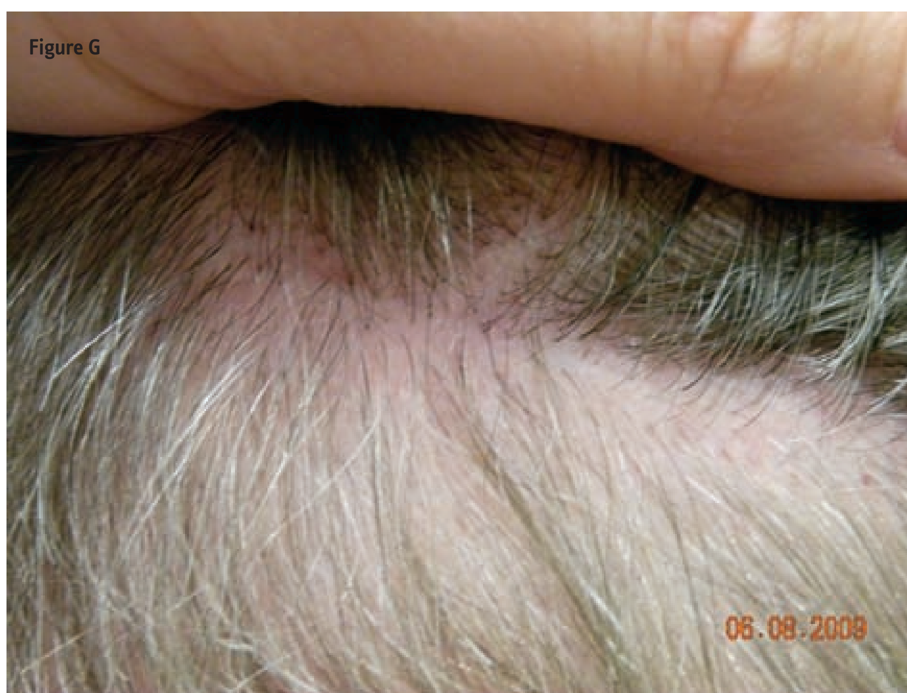


Figure G

consideration. The more contrast, the more hair required to achieve optical density. Dark hair on a Caucasian scalp is going to appear thinner or sparser than lighter hair. The opposite is the case with lighter color hair on individuals with darker scalps, such as African Americans. Curly or wavy hair appears to achieve more optical density because it camouflages the skin to a greater extent than straight hair. In the 1970s, men would perm their thinning hair to reduce the visual contrast between hair and scalp.

Hair texture is one of the most important factors influencing the number of grafts required for a specified area of the scalp. Hair shafts can either be very fine, fine, medium, medium coarse, or coarse.

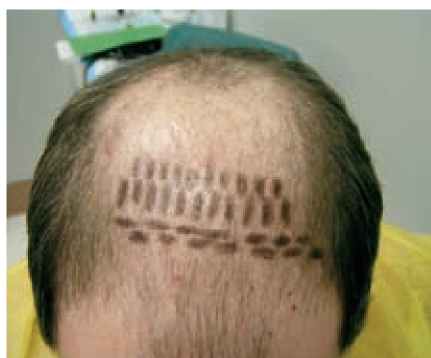


Figure H

The difference depends on the width of the hair: the wider or thicker the hair, the more optical surface density will be visualized.

Because each individual has a unique texture width, we can customize a recipient site blade to perfectly match the width of the follicular unit graft. In the past, recipient sites were made with pre-cut manufactured blades that were "one size fits all." With custom cut blades, we can place the grafts closer together to attain more density per square centimeter. These custom-made blades have allowed hair transplant surgeons to densely pack fine hair without compromising blood supply. We can transplant 50-60 follicular unit grafts per square centimeter in the hairline and approximately 40 follicular units per square centimeter over the frontal, midscalp, and vertex.

> **In the past, recipient sites were made with pre-cut manufactured blades that were "one size fits all." With custom cut blades, we can place the grafts closer together to attain more density per square centimeter.**

MEGASESSIONS

The term megasession varies from office to office and from surgeon to surgeon. There is no defined number of grafts transplanted per surgery that is widely accepted in the hair transplant community. Some offices may arbitrarily define a megasession as the transplantation of 2,000 or more grafts transplanted in one surgery, whereas other offices would define a megasession as 3,000 or more grafts placed in one surgery. The important thing to remember is why we perform megasessions: The greater the number of grafts transplanted per surgery, the faster the cosmetic coverage of the balding areas and the fewer the number of surgeries required to fill in the recipient region. This translates into less patient downtime and less time trying to camouflage the postoperative appearance. Thanks to megasessions, patients who have deferred or postponed undergoing hair transplantation because of reluctance to undergo multiple surgeries can achieve cosmetically acceptable coverage and density in one or two surgeries.

Not all offices can perform megasessions due to a lack of qualified, experienced hair technicians. On average, we transplant approximately 3,000 follicular unit grafts per surgery, but we have transplanted as many as 5,800 grafts in one surgery. Figure I shows a patient who received 4,876 grafts during a megasession. Keep in mind the number of grafts being transplanted in one surgery depends on donor region density, scalp elasticity, and the degree of baldness.

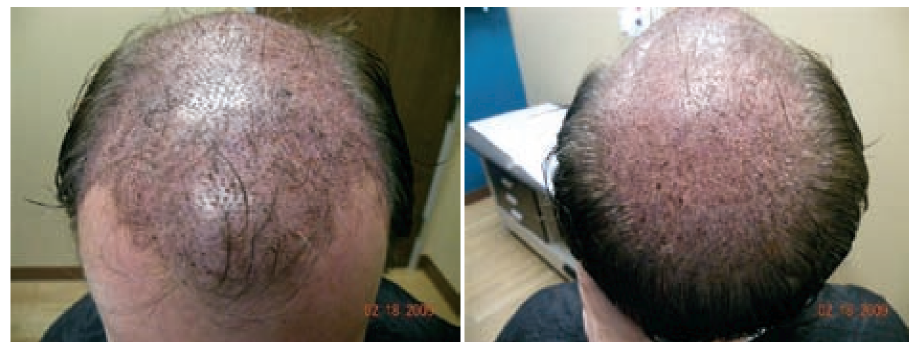


Figure I

CONCLUSION

Today, we can transplant up to 6,000 follicular unit grafts in one surgery depending on the donor region density, scalp elasticity, and the degree of baldness. Many patients can achieve the density and coverage they desire in one surgery, not the multiple surgeries required in the past. This is not your father's hair transplant. We can now achieve a totally undetectable, natural appearance your father would not believe.

A hair transplant surgeon practicing in Scottsdale, Ariz., for the past 23 years, Dr. Friedman was the Founding President of The American Board of Hair Restoration Surgery, Medical Advisor to The American Hair Loss Council, and Past President of the American Osteopathic College of Dermatology. Dr. Friedman is board certified in dermatology and hair restoration surgery .He is a Fellow of the International Society for Hair Restoration Surgery.