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One hundred follicular units transplanted into 1cm² can achieve a survival rate greater than 90%

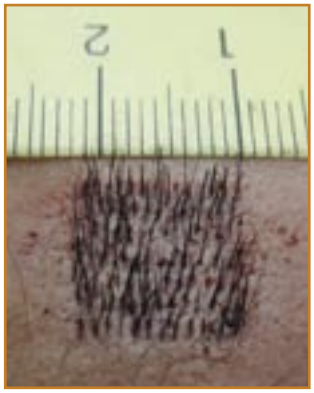
Akaki Tsilosani, MD, PhD *Tbilisi, Georgia*

The effectiveness and naturalness of the results of follicular unit (FU) transplantation is well proven, but the problem of hair growth yield with dense packing is a concern for many surgeons. How densely can the grafts be packed without harming their survivability? This issue has become the object of debate in recent years, especially in the era of megasessions when lots of clinics around the world offer the possibility of transplanting large quantities (3,000-6,000) of FUs in one surgery. Six years ago, when we attempted to increase the density of transplanted grafts with the purpose of achieving more natural results, the safe density for the survival of grafts was considered to be 25 FUs per cm². The research of Mayer, et al. indicated that the implantation of more than 30 FUs in 1cm² might reduce hair growth by 20-30%.[4] It was postulated by others that the insertion of 40 or more FUs into 1cm² could reduce graft survival because of compression.[3,4,7]

What is the reason for the reduction of graft survival, if it really occurs, in the circumstance of dense packing? As a result of analyzing this problem, we can list four possible factors:

1. "Lateral pressure" on the implanted grafts in very small recipient sites
2. "Ultra fine" preparation of grafts, leading to the absence of tissue around follicles, or artificial splitting of FUs with the purpose of enabling their implantation in smaller sites
3. Crush injury of grafts when assistants push them into small recipient sites
4. Violation of blood circulation in the recipient site by excessive incision density

Mechanically, high density cannot be achieved without reducing the size of recipient sites. In our opinion, implantation in small recipient sites, the sides of which tightly press grafts and provide maximum contact of the implant with the surrounding tissues, is optimal for survival. In this way oxygenation is restored faster, which is the main factor enhancing the survival of grafts. At the same time, small sites reduce bleeding and loss of grafts.[2,3]



100 grafts (70 two-hair and 30 one-hair FUs) are placed in a 1cm² area.

156 hairs grew in a 1cm² area.

Recipient sites ranging from 0.8mm to 1.25mm have long been considered ideal for grafts containing 1-4 hairs. Accurate preparation under stereoscopic microscopes makes it possible to achieve intact FUs, which are coated with fine layers of dermis, but don't contain extra tissue and epidermis. Such FUs have high survival capability and are easy to implant in recipient sites of < 1.5 mm.[2,8]

Although graft insertion in closely located small recipient sites is difficult for many assistants, especially at the beginning, we have come to the conclusion that this is not a technological problem but purely an issue of training. Our experienced assistants can fill 10-12 recipient sites of ≤1mm per minute. Moreover, they would prefer to work on small recipient sites because they cause less bleeding and graft popping.

The only other risk for the survival of grafts is violation of blood circulation in the recipient zone due

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