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Densitometry and Video-microscopy

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In evaluating a person with androgenetic alopecia for a hair transplant, typically the physician determines the patient's Norwood Class, designs a hairline, delineates the extent of coverage, "eyeballs" the donor area, and then decides upon the appropriate number of grafts. Taking specific measurements of hair density and donor miniaturization are not routinely performed. However, donor density and miniaturization are important variables in deciding which patients are good candidates for hair transplantation and are useful in determining how many grafts are needed in the procedure.

Densitometry is a technique that analyzes the scalp under high-power magnification to give information on hair density, follicular unit composition, and degree of miniaturization.

It can be used to help evaluate a patient's candidacy for hair transplantation and help predict future hair loss. More recently, video-microscopes have been developed that can project the image onto a computer screen and provide a permanent digital record. This paper describes the value of taking objective measurements, using densitometry or video-microscopy, in the hair transplant evaluation.



Figure 1. Hair Densitometer

Background

One of the earliest methods of measuring hair density was devised by Bouhanna, who used camera attachments to create a "phototrichogram," an ultra close-up photograph of hair exiting the scalp. This method provided the capability to document the quality and quantity of hair shafts. However, the disadvantage of this innovation was that an assessment could not be done until after the film had been developed.¹

In 1993, Rassman introduced a small hand-held instrument, the Hair Densitometer, to make densitometry easy to perform during a consultation.^{2,3} The hair densitometer is a self-contained, portable, device that houses a magnifying lens and an opening of predetermined size (Figure 1). The hair is clipped short (~ 1 mm) and the unit is placed directly on the scalp. An assessment is made from a standard 10mm² field. Multiple measurements taken from different parts of the scalp are often helpful, particularly if there is significant variability from one location to another.⁴ An advantage of the hand-held densitometer is that it is inexpensive and readily available to be used during the consultation and can provide immediate information regarding a patient's candidacy for surgery.

A number of other hand-held instruments to measure density have been developed with the similar basic elements of magnification, illumination and a calibrated field or ruler. With more



Figure 2. Micro-VID Digital Hand Held Microscope

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