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17th Annual Scientific Meeting



How to assess scalp laxity

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Laxity: What Is the Problem?

Assessment of scalp laxity prior to hair transplant procedures has been a clinical subjective evaluation that varies with each surgeon and each visit. Hair transplant surgeons have been traditionally assessing the laxity of the scalp with manual palpation of the donor area and by moving the scalp horizontally or vertically and estimating the scalp movement against the occipital bone. Measurements have been recorded with subjective terms such as very loose, moderately loose, average, moderately tight, and severely tight. With the exception of the well-known Mayer scale, which provides an estimation of the percentage of scalp elasticity, there have been no units of measurement available for assessing the scalp laxity. Thus, there are no standards for measurements of the scalp laxity to reassure the surgeon regarding his or her judgment.

Strip harvesting yields depend upon two parameters: average density of hair in the donor area, and surface area of excised strip. Larger transplant sessions require a longer and wider strip size. In larger hair transplant sessions, the height of the strip depends solely upon the laxity of the scalp. Removing wide strips will increase tension upon closing the wound. Higher wound tensions cause the following:

1. Difficulty closing the wound and wound dehiscence
2. Widening of the eventual donor scar
3. Wound ischemia and necrosis
4. Telogen effluvium of the surrounding skin

The patients who have a higher risk of donor wound complications include the following:

1. Patients with high ratio of demand to supply.
2. Those who have had repeated hair transplants with diminished scalp laxity after each surgery.
3. Patients with surgical scars on the scalp especially at or below the level of the projected new strip excision.
4. Patients who naturally have tight scalps.

Laxometer

The laxometer can provide a metric for measurement of the laxity of the donor wound before surgery when planning a procedure, and a variation of this same instrument can be used to estimate tension on the wound during the hair transplant while local anesthesia is applied and before strip removal.



Figure 1. Laxometer

Our clinical prototype was made of two pads that were able to have a good grip on the scalp. The laxometer consists of two coarse pads with a spread of about 5 cm (Figure 1). The lower pad is placed on the scalp skin just above the occipital bone after parting the hair in the area and the upper pad follows. The readings on the clinical instrument and its surgical counterpart were reproducible.

The first thing that came to mind after making the laxometer was to find an answer for one of our old questions: Can scalp exercise really improve the laxity of the scalp? We instructed a few patients to do scalp exercise and followed them on a monthly basis with laxometer measurements (Figure 2). All patients responded well to this treatment with significant improvement in scalp mobility. You can see the measured



Figure 2. Scalp exercise improves laxity.

Scalp laxity

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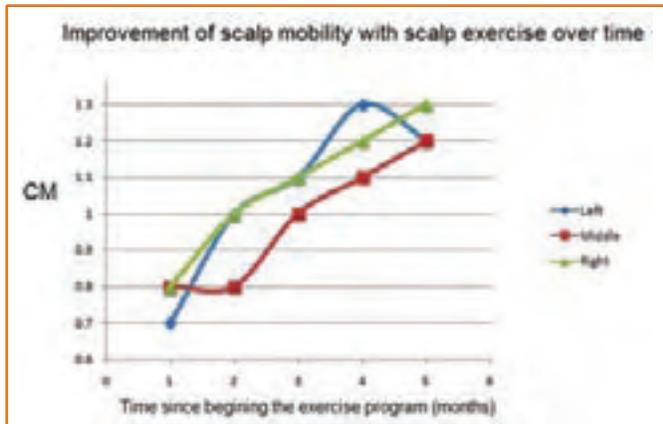


Figure 3. Measured mobility of the scalp skin (cm) over time with scalp exercise

laxity of the scalp in one of the patients who was compliant with the exercise and follow-up visits (Figure 3).

We have started to use the laxometer routinely on almost all patients; however, we continued to seek a method to decrease human error in measuring the laxity. Thus, we equipped the laxometer with a spring to provide a constant pulling force instead of the surgeon's hand pulling the pads. The two pads were attached to the skin with fixed needles (Figure 4) to eliminate slipping of the pads on scalp skin. Obviously, this method should be performed after applying



Figure 4. Intraoperative use of laxometer

the local anesthesia and before removing the strip. More studies are needed to compare the correlation between the two methods of laxometry to the closure tension of the surgical wound.

Conclusion

The laxometer can determine the laxity (mobility) of the scalp accurately with reproducible measurements. It can be used prior to the time of surgery and during surgery, and the device is able to apply a numerical value on scalp laxity, augmenting the surgeon's clinical judgment. In patients with tight scalps in whom we recommend scalp exercise/massage, the laxometer can follow the change of laxity in the scalp. ✧

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