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Hairline Correction in Women Using Thinning and Micro-Graduation Techniques

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Abstract: This article presents an analysis of the functional and aesthetic aspects of thinning and micro-graduation as applied hairdressing techniques for correcting the hairline in women. The study is based on an interdisciplinary approach that combines insights from aesthetic trichology, cosmetic dermatology, applied psychology, and visual anthropology. Special attention is given to thematic analysis of sources covering the morphological features of the frontal zone, psychoemotional perception of the hairline, and non-medical modeling practices. Key mechanisms of influence are identified, including optical contour softening, restoration of visual symmetry, and reduced emphasis on frontal imperfections through texturization. A comparative analysis of methods highlights the advantages of thinning and micro-graduation in terms of reversibility, individual customization, and applicability to localized defects. The necessity of accounting for morphological parameters, skin phototype, hair behavior, and stylistic expectations when selecting techniques is substantiated. The article presents an original typology of non-medical hairline correction methods, including textural, pigment-based, and device-assisted approaches. It also explores promising directions in hairdressing practice development, such as the standardization of visual diagnostics, integration of photo documentation, and the expansion of professional competencies in working with the frontal hairline. The article is intended for hairdressers, stylists, and aesthetic correction professionals seeking a personalized and evidence-based approach to hairline design.

Keywords: hairline, thinning, micro-graduation, hairdressing correction, visual modeling, frontal

zone, aesthetic trichology, non-medical methods, women's hairstyle, texturization.

Introduction

Modern hairdressing practice is demonstrating a shift in emphasis from universal haircut forms to high-precision work with hairlines, especially in the forehead and temple areas. Female client requests are increasingly related to the length and volume of hair and the geometry of its distribution at the marginal border. Refining the frontal hairline is becoming an element of visual balance and the subjective feeling of being well-groomed and confident [6]. This is particularly noticeable in the context of the prevalence of high hairstyles, open frontal areas, and a digital visual culture where faces are captured from various angles and perspectives.

The growing number of inquiries regarding "unnatural" or "displaced" hairlines underscores the need to rethink aesthetic and technical approaches. Against the backdrop of the limited applicability of transplantation and medical methods in everyday practice, especially in a salon setting, there is a growing interest in instrumental techniques for visual smoothing and correction. Such techniques include thinning and micro-graduation—localized methods that provide a softer and more natural transition of the hairline into the open part of the forehead [3]. These techniques are becoming part of a holistic strategy for working with the face. They allow for the creation of an illusion of greater density in a problem area, reduce the contrast between the skin and hair, and correct the growth pattern without intervening on the scalp. There is a need for a methodological documentation of the applicability limits of these techniques, their parameters, and their potential effects on different hair types, face shapes, and individual growth characteristics.

An important context is also the growing attention to the psycho-emotional comfort of salon clients. The perception of the hairline is increasingly linked to a sense of identity, age appropriateness, and visual self-acceptance on social media and in mirror reflections [4]. Therefore, even minimal changes in the marginal zone require high precision and conscious action from the stylist, as well as theoretical preparation for working with the client's visual and tactile expectations.

The objective of this study is to analyze the methods of thinning and micro-graduation as applied hairdressing techniques for correcting the female hairline, and to

identify their functional features and the conditions for their successful application in aesthetic practice.

Materials and Methods

The methodological basis of this research was a thematic analysis of scientific publications dedicated to the morphology of the hairline, the visual-aesthetic features of the female forehead and frontotemporal area, and the possibilities for correcting these parameters through non-medical procedures. The analysis focused on sources published in international peer-reviewed journals, primarily in the fields of cosmetic dermatology, aesthetic trichology, and plastic surgery. The literature was selected based on the relevance of its content, the evidence supporting its results, and the practical applicability of its conclusions.

The inclusion criteria were publications containing descriptions of the morphological types of the female hairline, the psycho-emotional consequences of its distortion, and documented cases of applying aesthetic and hairdressing correction methods. Special attention was paid to studies examining frontal fibrosing alopecia, pronounced imperfections of the frontal border, and their correction without the use of injectable, surgical, or hormonal interventions.

Among the analyzed works was the study by L.-Y. Chang et al. [1], which presents the evolutionary aspects and anthropological significance of long hair and the hairline in gender self-identification. The work of H. Fu [3] examines the most frequent requests concerning the masking of female baldness in aesthetic practice. In turn, the study by M. Landau et al. [7] describes the clinical context of frontal fibrosing alopecia; however, for our analysis, only those components with practical significance for general hairdressers in a non-medical setting were used.

Attention was given to a review of the diagnostic capabilities of modern imaging systems, such as the device-free scalp segmentation system described by Y. Kim et al. [5], which demonstrates the applicability of computer models in hairdressing diagnostics. The retrospective study by D. Fu et al. [2], dedicated to the correction of an unnatural hairline after laser hair removal, is considered an empirical basis for analyzing the aesthetic expectations of clients. The visual-psychological and qualitative-evaluative aspects of appearance perception in the context of hairline distortion are further substantiated in the work of O.

Rosales et al. [10], which allowed for correlating clients' motivations with stylists' corrective actions.

The results of the analysis are structured in a logical progression, moving from the study of hairline perception as a marker of gender identity and external harmony to a description of non-medical correction practices in cosmetic and trichological literature. The final segment of the analysis is dedicated to the techniques of thinning and micro-graduation as tools for visual modeling and evening out the frontal line in hairdressing practice.

The application of thematic analysis made it possible to compare the morphological features of the hairline with the applied modeling techniques, to identify the main areas of intervention, and to establish criteria for the visual acceptability of the result. This approach ensured

a comprehensive assessment of hairdressing correction methods and their justification from the perspective of scientific publications, without involving empirical or experimental material.

Results

As a result of the thematic analysis, it was established that the female hairline on the forehead performs a complex visual, social, and identity function that extends beyond purely physiological perception. Particular importance is attached to the shape, density, and symmetry of the line, which forms an impression of youth, health, and being well-groomed. These perceptions, in turn, determine the motivations for hairline correction in the absence of medical indications. Table 1 presents the key aesthetic and psychosocial priorities identified based on the analysis of the sources.

Table 1 – Aesthetic priorities in the design of the female frontal hairline (Compiled by the author based on sources: [1], [3], [10])

Thematic category	Refined provisions
Visual associations	The hairline is perceived as a sign of youth and health, provided it is symmetrical and dense.
Psycho-emotional context	The presence of frontal distortion becomes a motivation for correction, including by non-medical methods.
Gender identity	Hairline correction is included in the mandatory list of feminizing aesthetic procedures.

As can be seen from Table 1, visual expectations and cultural associations form the standards that the frontal line should meet. The perception of a distortion as a defect has both an external and an internal dimension, related to self-esteem, gender identity, and social roles. The need for hairline correction in women in the absence of clinical indications increases attention to

non-medical and hairdressing methods. These methods vary in their degree of invasiveness, the durability of the effect, and the required qualifications of the specialist. Based on the sources, a typology of the applied approaches was formed, presented in Table 2.

Table 2 – Non-medical methods of frontal hairline correction (Compiled by the author based on sources: [2], [7], [8], [9])

Method	Mechanism of action	Limitations of use
Optical camouflage	Densifying the frontal zone with pigments/fibers	Washes off, short-term effect
Micropigmentation	Imitation of hair growth via pigment in the dermis	Irreversibility, risk of color shift

Radiofrequency therapy	Stimulation of hair growth and thickening	Requires a course of treatment and instrumental density assessment
Hairdressing thinning and graduation	Softening the marginal zone by texturizing	Requires skill and analysis of hair structure

As can be seen from Table 2, each method has its limitations and is not universal. For example, micropigmentation provides a long-lasting effect but is associated with risks of irreversibility, while texturizing techniques such as thinning and micro-graduation are highly adaptable but require individual selection based on the morphological structure of the hair.

It should be noted that unlike hardware and pigment techniques, hairline correction through thinning and graduation does not alter skin structures but works exclusively on the plane of visual perception. This makes it particularly significant in situations where patients refuse interventions with potential side effects.

Discussion

In sources dedicated to the morphology of the female marginal hairline, the importance of creating visual softness and smoothness in the forehead area, especially in the lateral and temporal segments, is emphasized. The problem of a sharp and harsh hairline, as noted in the study by C.-Y. Ho et al. [4], enhances the perception of age and draws attention to a decrease in density. In this context, thinning is considered an effective non-medical technique for reducing contour tension, especially when the marginal hair structure is preserved but non-uniform.

The thinning method allows the hairdresser to vary the density and texture of the locks in the marginal zone, creating a visual effect of a gradual transition between the skin of the forehead and the main mass of the

hairstyle. As shown in the analysis by Y. Kim et al. [5], modern approaches to the optical reconstruction of the hairline focus on the complex shape of the contour, in which the central and lateral (side) projections are important. Thinning helps to avoid a harsh transition in these zones, which makes it relevant for correcting moderate forms of temporal recession.

Of particular note is micro-graduation, described in the review by M. Kinoshita-Ise et al. [6] as a structuring technique that gives direction and layering to the frontal area. This technique is especially effective in conditions of partial density reduction: by gradually layering locks with varying lengths, an effect of volume and the closure of subtle gaps is created. Graduation is applicable for working with asymmetry in the frontal zone, which is often observed after hardware procedures for stimulating hair growth, including laser treatment [8].

Both hairdressing techniques have significant potential in the aesthetic adaptation of the frontal line while preserving its biological activity. Their effectiveness increases with a competent diagnosis of the hair type, growth direction, and the severity of the local defect. Combining thinning and graduation into a single design scheme allows for achieving the most natural look, especially when working with clients seeking to achieve a visual feminization of their appearance without resorting to invasive methods. To compare the possibilities of hairdressing and medical approaches, Table 3 is presented, which examines the key parameters for restoring the female frontal line.

Table 3 – Comparison of approaches to restoring the female frontal line (Compiled by the author based on sources: [1], [2], [7], [8], [11])

Approach	Invasiveness	Reversibility	Duration of effect	Suitability for local defects
Transplantation	High	No	Long-term	High
Micropigmentation	Medium	No	Medium-term	Medium

Laser stimulation	Medium	Yes	Requires courses	Limited
Thinning / graduation	None	Yes	Until the next cut	High (aesthetic masking)

As can be seen from Table 3, the least invasive methods, which include hairdressing correction through thinning and graduation, have a number of unique advantages. First and foremost is complete reversibility and the possibility of individual adjustment for each growth pattern and hair type. This is particularly relevant in general practice, where aesthetic goals are combined with minimal trauma.

Based on the conducted analysis, which covers the aesthetic, psycho-emotional, and instrumental perspectives of frontal hairline design, a number of practical recommendations have been formulated for specialists in the field of hairdressing. These recommendations aim to ensure maximum individualization of approaches while maintaining stylistic appropriateness and aesthetic effectiveness.

In the presence of a pronounced straightness of the frontal contour, the use of thinning is recommended as the primary technique for softening the visual perception of the line. As shown in the research by C.-Y. Ho et al. [4], a sharp and uniform hair edge can enhance the perception of artificiality and draw attention to symmetrical or asymmetrical defects. The application of thinning techniques allows the hairdresser to form a density gradient, thereby reducing the harshness of the visual transition between the skin of the forehead and the main mass of the hairstyle. It is important to consider the state of the marginal zone. If there is significant hair reduction in this area, the effectiveness of thinning decreases, and the risk of visualizing gaps increases. For asymmetry in the marginal zone, caused by congenital features of the skull shape and acquired disorders (e.g., temporal recession), preference should be given to micro-graduation. This technique allows the hairdresser to layer locks step-by-step with varying lengths, achieving a natural distribution of volume and a visual evening out of the growth zone. Micro-graduation is particularly effective in modeling the "baby hair" effect—short, textured hairs that mimic natural growth along the forehead. As noted by M. Kinoshita-Ise et al. [6], including such an element in a hairstyle contributes

to the feminization of the appearance and an improved perception of youthfulness.

An important recommendation is a comprehensive diagnosis of the client's individual parameters. This involves three key variables:

Hair density in the marginal zone—determines the acceptable level of intervention. With high density, intensive thinning is possible; with low density, only gentle texturizing is permissible.

Forehead shape and facial oval—the frontal line should correlate with the architecture of the face. For a high forehead, soft cascades are preferable; for a low one, an emphasis on vertical textures is better.

Skin phototype and hair color—determine the visual contrast between the skin and hair; with high contrast (dark hair—light skin), more delicate work is required to avoid an excessive emphasis on the hairline.

Hair behavior during styling—affects the durability of the result; coarse, straight hair requires a different graduation than soft, wavy hair.

Thus, the hairdresser should view the correction of the frontal line not as an isolated technique but as part of the overall composition of the external image, which takes into account the biomechanics of the hair, individual morphology, and the client's psycho-aesthetic expectations. It is important to inform the client about the temporary nature of the hairdressing correction and the possible need for regular adaptation of the technique depending on hair growth and changes in styling.

Thinning and micro-graduation, being completely reversible and non-invasive, are highly applicable in a salon setting. However, their effectiveness directly depends on the stylistic competence of the specialist, their mastery of texturizing techniques, and their ability to interpret morphological signs. The optimal practice is a preliminary photofixation of the frontal zone and modeling the intended result before the cut, which increases predictability and client satisfaction.

As a result of combining these approaches, a highly adaptive, individualized format of hairdressing

correction of the frontal line is formed, capable of eliminating aesthetic imbalances and increasing the client's confidence by harmonizing their visual image.

Conclusion

The conducted research has established the morphological, aesthetic, and applied specifics of using thinning and micro-graduation as key tools for the hairdressing correction of the female hairline. It has been shown that these techniques provide a stable visual smoothing of the marginal contour, contributing to the formation of a soft and natural transition between the skin of the forehead and the main mass of hair, which is particularly important in cases of partial loss of density in the frontal zone.

It has been revealed that the aesthetic correction of the hairline goes beyond mere external transformation and is linked to psychological comfort, a sense of age and gender identity, and the perception of one's own appearance in the digital environment. The high adaptability of thinning and micro-graduation to the client's individual morphological features has been confirmed, including hair density, forehead shape, the color contrast between skin and hair, and their behavior during styling.

An analysis of the comparative characteristics of non-medical methods has shown that thinning and micro-graduation possess a unique combination of zero invasiveness, complete reversibility, and high precision when working with local aesthetic imperfections. Of particular importance is the ability to create the effect of fine marginal strands that mimic the natural growth of hair in the forehead area, which enhances the perception of youthfulness and the naturalness of the image.

The necessity of including hairdressing correction of the hairline in the systemic toolkit of general stylists has been substantiated. These techniques go beyond auxiliary operations and become independent means of forming visual balance, especially in cases where clients refuse medical or hardware interventions. Prospects for further research are related to the development of methods for photofixation of the marginal zone, the standardization of texturizing parameters, and the integration of morphological models into hairdressing educational programs.

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