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REVISION OF AESTHETIC STANDARDS OF MANICURE AND PEDICURE WITH AN EMPHASIS ON TAKING CARE OF THE HEALTH OF THE NAIL PLATE

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Abstract

The article is devoted to rethinking the aesthetic standards of manicure and pedicure in terms of maintaining the health of the nail plate. The article shows that the use of resistant coatings and related technologies for preparing and removing the material can lead to mechanical damage to the nail, such as thinning, brittleness, delamination and cracks. The article discusses the anatomical and physiological features of the nail apparatus, in particular, the importance of the matrix as a growth zone and the layered structure of the nail plate. The key physiological aspects of nail health are considered: their thickness, growth rate and the effect of hydration. Special attention is paid to the risk factors that arise when removing coatings and when using UV and LED lamps for polymerization. The sanitary requirements that must be observed during the pedicure process, including the treatment of equipment, are also considered. Based on the analysis of open clinical and professional sources, a practice-oriented concept is proposed. As part of this approach, the criteria for a "beautiful result" are complemented by an assessment of the condition of the nails and periarticular tissues after removing the coating and during repeated procedures.

Keywords: *nail plate, nail machine, matrix, and manicure, pedicure, resistant coatings, coating removal, mechanical damage, nail hydration, UV/LED polymerization, sanitary treatment, and gentle protocols*

Relevance of the study

The study is particularly relevant because in the modern manicure and pedicure industry, resistant coatings and technologies that require careful preparation of the nail plate have become widespread. These procedures include filing and polishing the nails, as well as regular removal of the material. Professional dermatological sources indicate that it is the mechanical impact that occurs during cutting and removing the coating that can significantly injure the nails. Regular repetition

of such procedures often leads to brittleness, delamination and cracks of the nail plate.

The problem becomes particularly relevant due to the need for polymerization of gel materials under ultraviolet or LED lamps. Experimental studies on cellular models show that the radiation used in UV nail dryers can cause DNA damage and mutational changes. This requires careful risk assessment and compliance with precautionary measures in practice. In these conditions, it becomes relevant to rethink aesthetic standards (criteria for a "beautiful" result) from the point of view of preserving the nail plate. This makes it possible to develop more gentle protocols, improve the quality and safety of services, and reduce the likelihood of negative consequences with prolonged and repeated use of resistant coatings.

The purpose of the study

The purpose of this study is to prove the need to review aesthetic standards in the field of manicure and pedicure. At the same time, the emphasis is on maintaining the health of the nail plate. In the course of the work, practical recommendations will be developed to help reduce the risk of nail damage during preparation, wearing and removal of resistant coatings.

Materials and research methods

The study was based on open clinical and professional sources devoted to the anatomy and physiology of the nail apparatus, as well as the characteristics of the nail plate, such as thickness, growth rate and hydration level. In addition, recommendations on the safe removal of stubborn coatings, precautions when using UV and LED polymerization, and sanitary standards in the field of pedicure were considered.

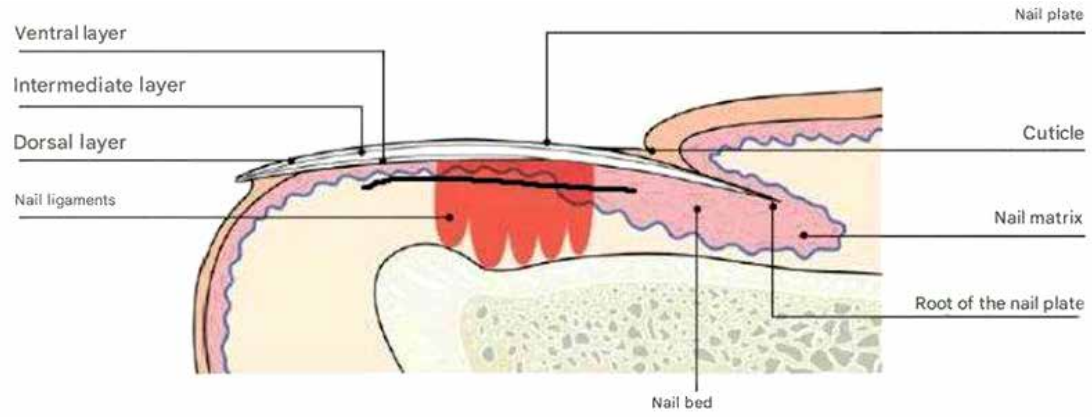
The methods of analytical review and comparative analysis are used in the work. We compared information about the structure and physiological features of nails with typical technological stages of manicure and pedicure. We also systematized risk factors and developed practical recommendations based on minimizing mechanical and chemical effects and compliance with sanitary standards.

The results of the study

The nail plate is a part of the nail apparatus, which includes not only the plate itself, but also the surrounding soft tissues: proximal and lateral nail rollers, the cuticle, matrix (growth zone), nail bed, hyponychia. The matrix is located under the proximal nail roller and is the main site of formation of the nail plate. The cells (onychocytes) formed from the keratinocytes of the matrix shift in the distal direction, creating a dense keratinized plate. In this case, a significant part of the material for the plate comes from the proximal part of the matrix (Anatomy, Shoulder and Upper Limb, Nails).

When assessing the condition of the nail plate, it is important to understand that damage to the matrix can lead to different consequences than changes that affect only the plate itself. The matrix is responsible for the quality of new growth, while the plate is the final product of keratinization and is not capable of regeneration like living tissue, but only grows during the renewal process.

Figure 1. *Anatomical structure of the nail apparatus (transverse section of the nail plate and adjacent structures) (Terminal Layer)*



From the point of view of morphology, the nail plate is described as a lamellar structure consisting of three tightly connected layers: dorsal, intermediate and ventral (see the figure 1).

It is known that the dorsal and intermediate layers are mainly formed from the matrix, while the ventral layer is formed by the so-called "sterile matrix" or nail bed. The formulations may differ from source to source, but the principle of the three-layered nail plate remains unchanged. This fact is of great practical importance for careful nail care. The "strength" of the nail plate is ensured not only by its thickness, but also by the integrity of the layers, as well as the connections between them. In addition, the contact state of the plate with the nail bed is important, which describes relief structures that increase the area of adhesion.

The physiological features of nails, which often serve as the basis for assessing their safety, include plate thickness and growth rate. Table 1 shows the average thickness of the nail plates, which differ for the nails of the hands and feet, as well as depending on gender.

Table 1. *The average thickness of the nail plate in men and women*

Indicator (average values)	Fingernails (mm)	Toenails (mm)
Nail thickness in women	0.5	1.38
Men's nail thickness	0.6	1.65

A source: (Common nail changes and disorders in older people:)

The growth rate of the nail plate is a quantity that can be measured. It directly affects how quickly nails "compensate" for damage by growing back. This leads to an important conclusion for manicure and pedicure masters: any aesthetic procedures that affect the appearance of the plate will "come off" the hands and feet at different speeds. Therefore, when assessing the condition of nails, for example, changes in shape, surface or color as they grow, it is necessary to take into account this difference in the rate of renewal.

Hydration is a key factor affecting the mechanical properties of the nail plate. Scientific reviews emphasize that the water in the nail is contained in two forms: bound and free. Its interaction with protein structures, including disulfide bonds, plays a significant role in hydration processes, differing from the skin. According to clinical data, the normal water content in the nail is about 18%. A decrease in this level can lead to increased brittleness, while its excess contributes to excessive flexibility. Therefore, when assessing the condition of nails, it is necessary to pay attention not only to their appearance, but also to the signs that reflect the balance of hydration and the integrity of the layered structure (Understanding the Formidable Nail Barrier:).

Aesthetic standards in the field of manicure and pedicure have evolved in parallel with the development of services and materials. From the desire for "neat and well-groomed nails", we came to the desire to get a lasting and flawless decorative effect. At the end of the 19th century, manicure was firmly established as a salon service. In the 1930s, the spread of colored lacquers became an important milestone in the development of very decorative nail design. And in the second half of the 20th century, standards increasingly began to focus on "constructed" aesthetics: elongation, reinforcement, preset shapes and a perfectly flat surface.

The widespread use of gel systems and other resistant coatings has contributed to the fact that wear duration and gloss durability have become perceived as important quality criteria. At the same time, the nail care market continues to grow, which leads to frequent trend changes. Social networks, in turn, contribute to the rapid spread of visual images and the consolidation of new norms through popular references and repetitive designs. As a result, modern standards represent several competing models, from an emphasis on naturalness to complex decorative solutions. These standards largely depend on technology, marketing, and visual culture.

The aesthetics of manicure and pedicure, based on the principle of preservation, suggests that the result of the procedure is assessed not only by its appearance immediately after its completion, but also by how the integrity of the nail plate and surrounding tissues is preserved after removing the coating and during repeated sessions. In the professional recommendations of dermatologists, it is noted that in everyday practice, the main risks to the nail are associated not so much with coating as with its aggressive removal (scraping, "peeling") and excessive mechanical processing. Therefore, safe protocols are aimed at minimizing traumatic effects and careful removal of material.

From an aesthetic point of view, a "beautiful" manicure and pedicure is, first, a properly organized process. It involves minimizing skin contact with acetone, avoiding forced removal of the coating and mandatory restoration of the barrier properties of the skin around the nail after the procedure. The American Academy of Dermatology (AAD), in its open recommendations for gel manicure, separately highlights the practice of removing the coating using cotton swabs soaked in acetone and fixing with foil. This minimizes the contact of acetone with the skin of the hands, leaving it mainly on the nails (Table 2). This approach is closely related to the principle of preservation: the less chemical and mechanical impact, the more likely it is to preserve the surface of the nail plate and the periarticular skin in a condition suitable for subsequent procedures without accumulation of damage.

Table 2. *Examples of approaches that put "aesthetics" into preservation mode*

Procedure component	Safety-oriented practice	Based on what
Removing the gel coating	Local acetone contact: cotton swab + foil fixation on fingertips	AAD recommendations for more gentle removal
Mechanical impact	Rejection of rough coating removal; removal after softening	AAD Recommendations for preventing nail injury during removal
After the procedure	Skin restoration (moisturizing and care) to reduce dryness and irritation	AAD recommendations for post-gel care

A source: (Gel manicures: Tips for healthy nails)

A separate area in the field of "gentle aesthetics" is related to the use of ultraviolet (UV) and LED lamps for polymerization of materials. There are different views in the professional community about the risks associated with these lamps. On the one hand, it is believed that exposure to UV lamps for nails usually does not pose a great risk to the client, although accurate measurements and consideration of real conditions are necessary to accurately understand this issue. On the other hand, more recent studies and discussions of risks emphasize that radiation doses, characteristics vary between lamps, and that taking reasonable photoprotection measures can further reduce potential negative effects. Rethinking aesthetic standards is important for two reasons. First, the "quality of service" includes informing the client about simple protective measures, such as the use of fingerless barrier gloves or photoprotection of the skin of the hands. Secondly, the reduction of unjustified exposure becomes the norm, that is, the rejection of "drying just in case", if this is not required by technology and the manufacturer's instructions.

The principle of safety in pedicure also implies the need to take into account possible infectious risks. This is because foot aesthetics often includes water treatments and the use of special equipment. Proper cleaning and disinfection significantly reduce the chance of infection. Here are the basic processing frequency requirements: disinfection in front of each customer, regular processing at the end of the working day, it is important to observe the "contact time" of the disinfectant indicated on

the label. It usually takes about 10 minutes, but it can vary depending on the specific remedy (Preventing Pedicure Foot Spa Infections).

The minimum organizational requirements that directly support "gentle aesthetics" in pedicure are presented in Table 3.

Table 3. *The main organizational aspects that directly affect the quality and aesthetics of a pedicure*

The security element	What should be done
The frequency of disinfection of baths	Between each meeting with clients and at the end of the working day
Contact time of the vehicle	Keep the time indicated on the label (usually about 10 minutes, but it depends on the product)
Risk justification	Cases of infections related to hot tubs for feet used in pedicure have been described. This highlights the importance of following the processing rules

A source: author's development

To preserve the health of the nail plate, it is necessary to avoid its mechanical and chemical damage, as well as to observe hygienic standards. Open dermatological sources emphasize that when using resistant coatings, the greatest damage to nails is caused not so much by their application as by aggressive removal. It is not necessary to peel off or peel off the gel coating, as this leads to the removal of the surface layers of the nail plate and its thinning. A more reasonable solution would be to pre-soften the material with acetone and apply it locally to the nail plate. For example, you can use cotton swabs and fix them, which will reduce the risk of damage to the skin around the nail and the plate itself.

After removing the coating, it is recommended to carry out restorative nail care to prevent their dryness and brittleness. According to research, regular moisturizing of the skin of the hands and cuticles helps to maintain protective properties and reduce the risk of nail plate delamination. It is also worth considering that prolonged contact with water can weaken the nails, so it is recommended to use protective gloves when doing household chores.

Table 3 provides practical recommendations for nail care, as well as their preventive value.

Table 3. *Practical measures to preserve the nail plate and their preventive value*

Stage	Risk	Correct practice	How to understand that everything is done correctly	Effect
Nail preparation	Thinning due to overuse	Minimize sanding, do not «remove the layer» unnecessarily	No burning /hypersensitivity, no furrows	Less brittleness and layering
Treatment of the skin around the nail	Microtrauma, inflammation	Without aggressive cutting, without tearing the skin	No bleeding, no severe redness	Preservation of the skin barrier
Applying the material	Skin irritation, detachment	Apply strictly to the plate, do not get on the skin	The material does not get into the rollers and cuticle	Less irritation and injury when removing
The sock of the cover	Coating failure and injury to the nail	Do not pry or tear when the nail is detached	Removal is only planned, without rough tearing of the nail	Preservation of the upper layers of the nail

Stage	Risk	Correct practice	How to understand that everything is done correctly	Effect
Removing the coating	Thinning during peeling / scraping	Remove after softening or correctly layer by layer	There are no «pits», torn areas, white traumatic spots	Less damage to the plate
Solvent contact	Dryness and irritation of the skin	Apply locally to the nail, limit skin contact	The skin is not overdried, without cracks	Comfortable recovery
Household loads	Nail stratification from water/chemicals, chips	Gloves when cleaning, do not use nails as a tool	Less chipping and layering	Reduction of mechanical/chemical stress
Pedicure and sanitation	Infection risks	Cleaning and disinfection of equipment according to the regulations	There is an observance of exposure time, clean surfaces	Prevention of complications
When to change the protocol	Accumulation of damage	Reduce the load, increase the intervals, review the technique	The symptoms decrease in several cycles	Prevention of chronic injury

A source: author's development

In the field of pedicure, one of the key principles is strict adherence to sanitary standards. In open sources provided the sanitary control authorities emphasize it emphasized that pedicure baths must be thoroughly cleaned and disinfected after each client. In addition, it is necessary to use disinfectants in accordance with the manufacturer's instructions, observing the recommended exposure time. These precautions are aimed at preventing infectious complications that may occur as a result of microtrauma of the skin of the feet and periarticular tissues.

Conclusions

The safety of the nail plate should be no less important criterion for the quality of manicure and pedicure than the aesthetic result. The nail plate, like any other part of our body, is not capable of regeneration. It is updated only during the growth process. Damage that occurs with improper care can accumulate and manifest as brittleness, delamination, and cracks. To avoid this, it is necessary to take into account the anatomy of the nail apparatus, especially the role of the matrix, as well as physiological parameters such as thickness, growth rate and hydration. It is also important to consider technological risk factors. Compliance with these principles makes it possible to create a "gentle aesthetic" in manicure and pedicure, in which the priority is gentle preparation and removal of coating, limiting excessive exposure to solvents and the rational organization of the polymerization process. In pedicure, the principle of safety is complemented by strict compliance with sanitary requirements for the treatment of equipment, which significantly reduces the risk of infectious complications.

Thus, rethinking aesthetic standards in terms of maintaining the integrity and safety of procedures significantly reduces the risk of negative consequences with frequent use of resistant coatings.

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