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Operating Standard of Alpha Hydroxy Acid Chemical Peel

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Preface

This document is drafted under the provisions of GB/T 1.1-2020 "Directives for Standardization—Part 1:Rules for the structure and drafting of standardizing documents."

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Introduction

Alpha hydroxy acid chemical peel is one of the most commonly used chemical peels in clinical practice. It is mainly used for skin repair and reconstruction for cosmetic and therapeutic purposes. Currently, as a quick, safe, and effective clinical treatment and cosmetic procedure, alpha hydroxy acid chemical peel is widely used in dermatology and cosmetic clinics.

However, with the continuous development of alpha hydroxy acid chemical peel and the expansion of clinical indications, corresponding issues have also emerged more frequently. Due to the lack of standardized guidelines for

the application of alpha hydroxy acid chemical peels in the field of skin aesthetics, the incidence of complications has been increasing. Therefore, it is necessary to standardize the operational treatment process, leading to the formulation of the "Operating Standard of Alpha Hydroxy Acid Chemical Peel."

The purpose of this document is to make the operation of alpha hydroxy acid chemical peel more professional, precise, and specific. This initiative aims to facilitate standardized training and guidance to improve its safety and effectiveness. Ultimately, it seeks to elevate the overall quality of the industry, promoting the positive, orderly, and scientific development of chemical peels in the field of skin aesthetics.

1. Scope

This document specifies the basic requirements, efficacy assessment, operational key points, nursing care for complications, and health education for alpha hydroxy acid chemical peel.

It applies to medical and nursing personnel in dermatology departments and skin laser cosmetic institutions at all levels.

2. Normative references documents

There are no normative reference documents in this document.

3. Terms and definitions

The following terms and definitions apply to this document.

3.1. Chemical peels

Using chemical substances on the skin to induce controlled skin damage at various levels, thereby prompting the reconstruction of the epidermis and dermis structures and achieving therapeutic goals.

Note: Common chemical peeling agents include alpha hydroxy acids (AHAs), beta hydroxy acids (BHAs), and compound acids.

3.2. Alpha hydroxy acid chemical peel

One of the commonly used chemical peels. AHAs are a group of organic acids extracted from fruits and dairy products. They are named for their hydroxyl group (-OH) located at the α position, hence they are also known as α-hydroxy acids (AHAs). AHAs are diverse, including malic acid (apples), tartaric acid (grapes), citric acid (lemons and oranges), mandelic acid (bitter almonds), glycolic acid (sugarcane), and lactic acid (yogurt). The properties of AHAs vary. Among them, glycolic acid is the best. It has the smallest molecular weight and a simple molecular structure. Glycolic acid is non-toxic, odorless, and has strong permeability. It penetrates the stratum corneum easily, allowing for better absorption by the skin while causing minimal damage. Low concentrations of AHAs can reduce the connections between cells in the stratum corneum. High concentrations (≥50%) of AHAs can facilitate epidermal exfoliation and improve dermal structure. Currently, as a quick, safe, and effective clinical treatment and cosmetic procedure, alpha hydroxy acid chemical peel is widely used in dermatology and cosmetic clinics. The primary applications include treating acne vulgaris, rosacea, melasma, post-inflammatory hyperpigmentation, photoaging, keratoderma, acne scars, dull complexion, and rough skin.

3.3. Acne vulgaris

A chronic inflammation of hair follicles and sebaceous gland units caused by multiple factors. It typically presents with comedones, papules, pustules, cysts, and nodules. The condition often recurs, and in severe cases, can significantly affect the patients' appearance and has a prolonged course.

3.4. Rosacea

A chronic inflammatory skin condition caused by multiple factors, primarily affecting the facial bloodvessels and perifollicular sebaceous units. It presents with facial flushing, erythema, papules, pustules, and telangiectasia, often accompanied by dryness, burning, stinging, and itching.

Note: Formerly known as acne rosacea or adult acne.

3.5. Melasma

A common acquired pigmentary disorder, clinically presents as patches ranging from light brown to dark brown. It primarily appears on exposed areas of the face, especially on the cheekbones and cheeks, and often shows a symmetrical distribution.

Note: The onset of melasma is influenced by genetics, endocrine disorders, autoimmune conditions, psychological factors, pregnancy, sun exposure, cosmetics, long-term oral contraceptive use, etc.

3.6. Photoaging

Chronic skin damage resulting from external environmental factors, particularly prolonged ultraviolet radiation exposure. It manifests as discoloration, reduced elasticity, and wrinkles, significantly affecting the aesthetic appearance of the face.

Note: Also known as extrinsic aging of the skin.

3.7. Keratoderma

A group of skin diseases characterized by hyperkeratosis (thickening of the stratum corneum beyond its normal thickness), including conditions like keratosis pilaris, porokeratosis, and ichthyosis.

3.8. Post-inflammatory hyperpigmentation

Acquired skin pigmentation that appears after acute or chronic inflammatory reactions, and is one of the common clinical symptoms.

3.9. Acne scars

Caused by inflammation in specific areas of the skin, leading to the proliferation or loss of subcutaneous collagen fibers. They can be classified into atrophic scars, hypertrophic scars, and keloids, and are a common complication of moderate to severe acne.

4. Basic principles

(1)Personnel operating alpha hydroxy acid chemical peel should be registered nurses or doctors who have received relevant knowledge and operational skills training.

(2)Alpha hydroxy acid chemical peel should be conducted in legitimate medical institutions or medical aesthetics facilities.

(3)Patients should receive education on the relevant knowledge of alpha hydroxy acid chemical peel.

(4)Informed consent for alpha hydroxy acid chemical peel treatment should be signed before the procedure.

(5)Treatment should strictly adhere to the operational treatment procedure of alpha hydroxy acid chemical peel.

5. Indications and contraindications

5.1. Indications

Common indications include:

a) Acne vulgaris;

b) Rosacea;

c) Melasma, post-inflammatory hyperpigmentation;

d) Acne scar;

e) Skin photoaging;

f) Others: keratosis pilaris, ichthyosis, cutaneous amyloidosis, etc.

5.2. Contraindications

Common contraindications include:

(1) People with poor general health, such as psychiatric disorders, psychological impairments, or unstable emotions;

(2) People allergic to chemical peel agents or other components;

(3) People with sensitive skin conditions, such as those with contact dermatitis, eczema, or other allergic skin diseases at the treatment area; local infectious skin diseases like active herpes simplex or pyoderma; or unhealed wounds.

(4) People with bleeding disorders or immunodeficiency diseases;

(5) Pregnant and lactating women;

(6) People with unrealistic expectations regarding treatment outcomes;

5.3. Relative contraindications

(1) People with recent ablative laser treatment, cryotherapy, dermabrasion, or other invasive treatments;

(2) People with recent use of oral retinoid medications should undergo treatment cautiously under the guidance of a medical professional;

(3) People who cannot strictly avoid sun exposure post-procedure.

6. Operational treatment procedure

6.1. Pre-operational Assessment

(1) Assess the patients' background knowledge about alpha hydroxy acid chemical peels. Explain the treatment method, operation process, expected effects, precautions, and adverse reactions to the patient patiently, and sign the informed consent form.

(2) Assess the patients' general information, including current medical history, past medical history, drug allergy history, and any contraindications to treatment.

(3) Assess the skin condition at the treatment area and take photos.

6.2. The Procedure of the Operational Treatment (See Appendix A)

6.3. Key Points of the Operational Treatment

6.3.1. Preoperative cleansing

Cleanse the treatment area skin using a facial cleanser or makeup remover to remove surface dirt. If acne vulgaris or hyperkeratosis is present, sterile cotton pads dipped in 75% alcohol or other effective cleansers can be used for secondary cleansing of the treatment area to enhance the penetration depth and uniformity of the chemical peel agent.

6.3.2. Skin preparation

Apply erythromycin ointment or petroleum jelly to protect damaged skin areas, delicate areas, mucous membranes (such as lips), and areas prone to acid residue (such as corners of the mouth, sides of the nose, inner and outer corners of the eyes). Cover both eyes with moistened gauze to prevent acid from entering the eyes.

6.3.3. AHAs selection

AHA treatment should start at a low concentration, and increase gradually as the skin tolerates it. For glycolic acid, commonly used concentrations include 20%, 35%, 50%, and 70%. The treatment response of the skin varies with different pH levels of AHAs.

For AHAs with a pH below 3.5, the typical starting concentration for facial treatments is 20%. The duration of AHA application on the skin is recommended to be between 1.5 to 5 minutes. This can be adjusted based on the endpoint reactions observed during treatment, such as erythema and frosting, and the tolerance level of the subject. Subsequent treatment concentrations and application times can be determined based on the skin's reactions (such as itching, redness, stinging, crusting, peeling, and others) after previous treatments. Increasing the application duration or raising the concentration of glycolic acid further enhances its effectiveness. For example, initial treatment starts with a concentration of 20%. Continue the treatment with the same concentration used in the initial treatment until the skin can tolerate it completely, typically ranging from 5 to 7 minutes. In thicker skin areas or areas with more resistant lesions, the duration time may be extended up to 10 minutes as needed. For subsequent treatments, higher concentrations of glycolic acid can be considered, or the concentration can be increased progressively based on the patient's response after previous treatments. For example, the sequence might start with 20% for the first treatment, followed by 35% for the second treatment, 50% for the third treatment, and 70% for the fourth treatment. For acid solutions with concentrations below 50%, the treatment intervals are typically between 2 to 4 weeks. For acid solutions with concentrations of 50% and above, the treatment intervals are generally 4 weeks. Usually, one course of treatment consists of 5 sessions. If the treatment interval is more than 3 months, it is necessary to restart at the lowest concentration (20%). When treating body areas and keratoderma (such as keratosis pilaris, etc.), an initial concentration of 50% can be used, and the application time can be extended as needed, up to a maximum of 30 minutes. Close observation of the skin's endpoint reactions is recommended, and feedback from the subject should be obtained.

For AHAs with a pH above 3.5: Treatment can start directly with a 30% concentration. The application time on the skin can range from 10 to 30 minutes, with skin reactions and patient tolerance used as criteria for neutralization. The treatment interval is generally two weeks, with a typical course consisting of 4 to 6 sessions. The treatment efficacy primarily depends on the duration of the glycolic acid application and typically does not result in severe adverse skin reactions.

6.3.4. Application of acid solution

Use a special brush to apply the acid solution while starting

a timer. Generally, begin by brushing the "T-zone" and finish with the cheeks. Within 30 to 60 seconds, apply the acid solution evenly, gently, and quickly from the inside to the outside of the treatment area. One application is usually sufficient, but the key treatment areas can be reapplied as needed. Avoid localized pooling or dripping of the acid solution, and prevent excess solution from overflowing into the eyes, neck, ears, or other non-treatment areas. During the procedure, maintain communication with the patient, inquiring about their sensations and carefully observing the skin's reaction in the treatment area. Determine the acid solution's duration based on the patient's feedback and skin reactions, and be ready to neutralize at anytime. When applying the solution, do not forget that the higher the concentration and the longer the duration, the stronger the chemical peeling effect and the more significant the results. However, the risk of adverse reactions also increases correspondingly.

6.3.5. Endpoint reaction

6.3.5.1. For AHAs with a pH below 3.5

(1) Ideal endpoint reaction: Mild erythema, slight stinging sensation, or scattered frosting observed on the treated skin area.

(2) Excessive treatment reaction: Severe pain exceeding level 6, or the appearance of blisters and extensive whitening of the skin.

(3) The treatment typically does not exceed the designated time of 5 minutes. If these conditions occur, immediately spray an alkaline neutralizing solution (such as 10% sodium bicarbonate) to terminate the treatment.

6.3.5.2. For AHAs with a pH above 3.5

(1) Ideal endpoint reaction: Mild erythema Tingling sensation on the treated skin area

(2) The treatment typically does not exceed the designated time of 30 minutes. If the condition occurs, immediately spray a neutralizing solution to terminate the treatment.

6.3.6. Neutralization process

Protect the patient's eyes with cotton pads when spraying the neutralizing solution. Hold the spray bottle of neutralizing solution in one hand, and quickly and accurately spray the treatment area skin, while using a cotton pad to absorb excess solution on the skin with the other hand. The neutralization process can be repeated multiple times until no more foam is produced on the sprayed skin surface and there is no stinging sensation on the skin.

6.3.7. Post-operational care

Apply a moisturizing and repairing mask to the treated skin area for cold compress (the mask can be refrigerated for use) for 20-30 minutes or wrap anice pack in gauze for an ice compress, then apply repairing and moisturizing skincare products (avoiding damaged skin areas). For patients with acne vulgaris, after cold compress, perform needle extraction based on the condition of the skin lesions. If there are deep comedones, inform the patient before the treatment that there maybe an increase in comedones after the initial treatment due to the exposure of deep comedones following exfoliation, which is normal. Continue treatment and perform needle extraction, and the symptoms will gradually improve.

6.3.8. Precautions

The operator should select the appropriate chemical peel agent according to the patient's skin properties, master the type, concentration, dosage, application duration, and treatment intervals, and make appropriate adjustments according to the patient's skin reaction during the entire course of treatment to achieve the best therapeutic effect. During the treatment of melasma, the concentration of AHAs should not be too high and the duration time should not be too long, so as not to irritate the skin and aggravate the pigmentation symptoms.

7. Nursing care for complications

7.1. Local Irritation Symptoms

Most patients feel mild stinging, itching, or burning during treatment, with observable mild erythema or frosting, all of which are normal reactions to AHA treatment. Symptoms can gradually subside after a cold compress with a repair mask. If the symptoms such as erythema and stinging persist or significantly worsen, follow the doctor's instructions for timely treatment. Take small doses of glucocorticoids if necessary.

7.2. Desquamation and Scabbing

Mild desquamation and scabbing after the operation are normal reactions following an alpha hydroxy acid chemical peel and will recover without treatment. Instruct patients not to scratch the skin or forcibly remove scabs, but to allow them to fall off naturally. Applying moisturizing and repairing skincare products can promote recovery.

7.3. Pigmentation

The higher the concentration of chemical peel agents and the deeper the penetration, the greater the chance of pigmentation. Individual differences in patient's skin may also cause post-inflammatory hyperpigmentation. Improper care after alpha hydroxy acid chemical peel, especially neglecting sun protection, can easily lead to post-inflammatory hyperpigmentation. Once hyperpigmentation occurs, timely symptomatic treatment is necessary. Instruct patients to strictly avoid sun exposure (use physical sun protection and sunscreen products), and reduce outdoor activities during periods of high UV index (e.g., from 10 AM to 4 PM in summer).

7.4. Scar

Too high a concentration of chemical peel agents, too long duration time, forced scab removal after surgery, and infection caused by improper care can all lead to the formation of scars. Therefore, the acid concentration should be selected carefully, preferably low rather than high, and the duration time should be reasonably controlled. If scabs or desquamation occur after the operation, instruct patients to avoid scratching and allow them to fall off naturally. Patients developing scars can undergo anti-scar treatment (use scar-preventing ointments or patches in the early stage and conduct laser repair treatment in the late stage).

7.5. Reactive Acne

Chemical peel agents can promote the dissolution and exfoliation of keratin plugs at the openings of hair follicles and sebaceous glands, allowing the accumulated sebum to be discharged through the cleared ducts. However, due to the irritant nature of chemical peel agents, some acne vulgaris patients may experience reactive inflammation, resulting in temporary increases in lesions or exacerbation of inflammation after treatment. Patients with reactive acne should receive timely symptomatic treatment and carefully choose the timing for continued treatment after lesions improve.

7.6. Secondary Bacterial, Fungal, and Viral Infections

A thorough assessment of the patient's skin should be conducted before alpha hydroxy acid chemical peel. The operating treatment procedure should be strictly followed during the operation to prevent secondary infection. If infection occurs, choose sensitive drugs for active anti-infection treatment promptly.

7.7. Other Reactions

Some patients may also experience adverse reactions such as contact dermatitis, milia, or urticaria, which should be treated symptomatically and promptly.

8. Health Education

8.1. Guide patients to develop a healthy lifestyle

Maintain regular routines, have adequate sleep, eat a light diet, avoid smoking and alcohol, consume more fresh vegetables and fruits, focus on self-psychological adjustment, reduce psychological stress, and keep a happy mood.

8.2. Avoid using makeup products within 24 hours after operation

Within 1 to 2 days after operation, local redness or pain may occur, which can be alleviated with cold compresses or cold sprays. Within 3 days after operation, apply collagen or hyaluronic acid masks daily for moisturizing and repair through cold compresses. Within 3 to 7 days after operation, desquamation or scabbing may occur in the treated area, which should be allowed to fall off naturally to prevent hyperpigmentation. Avoid high-temperature environments, such as hot compresses, hot sprays, hot springs, and saunas within 7 days after operation.

8.3. After the operation, pay attention to sun protection and perform moisturizing and repair care, especially for melasma patients

Use functional skincare products after AHA treatment to reduce skin irritation and promote skin regeneration and repair.

8.4. Avoid rubbing the skin after the operation

Be cautious with other exfoliating agents (e.g., retinoids, exfoliating skincare products).

8.5. Closely monitor adverse reactions in the treated area after operation.

If symptoms such as redness, blisters, scabbing, or hyperpigmentation occur, treat them symptomatically and seek medical advice if necessary.

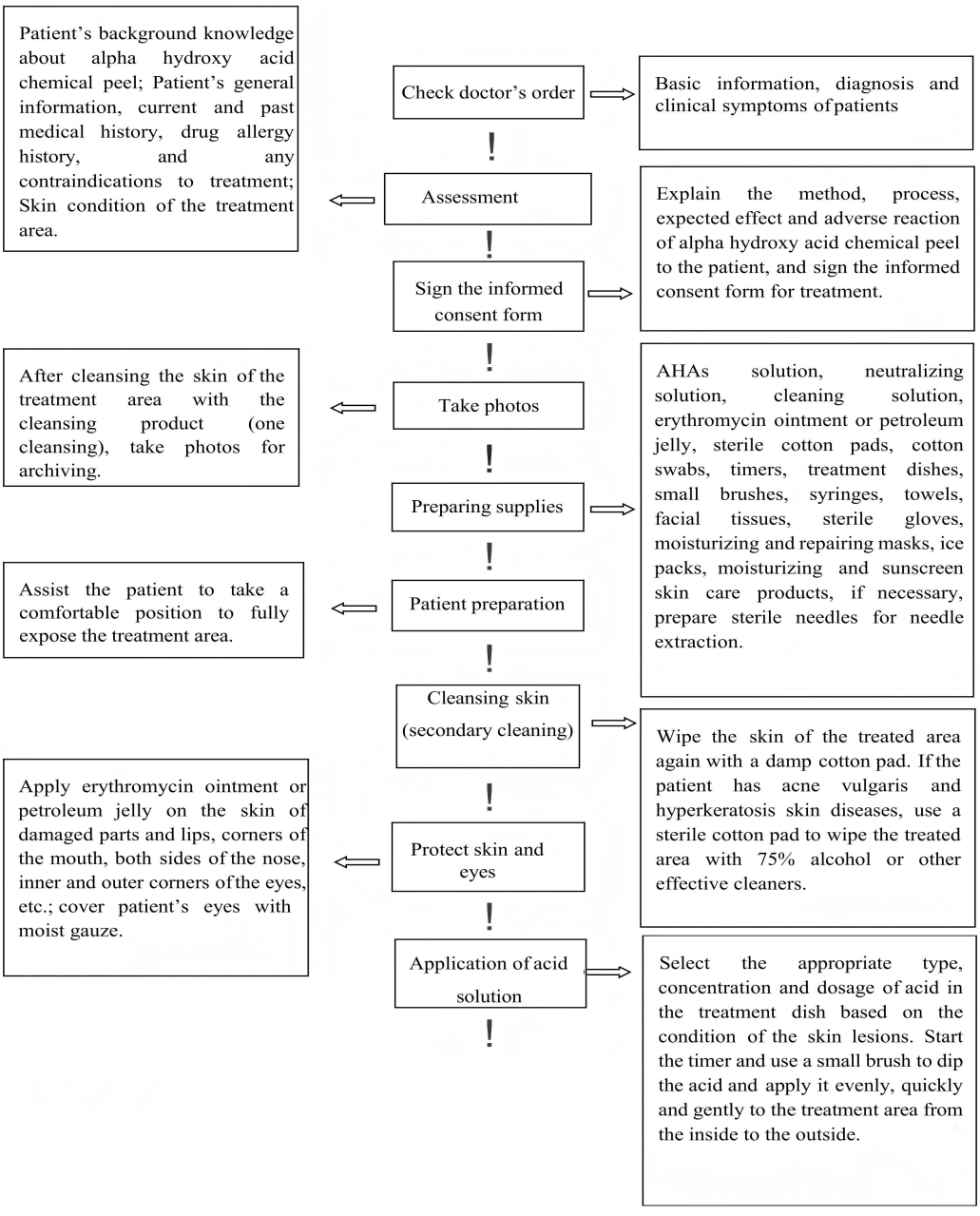
8.6. Acne patients should not squeeze skin lesions with their hands, so as not to aggravate infection and scarring

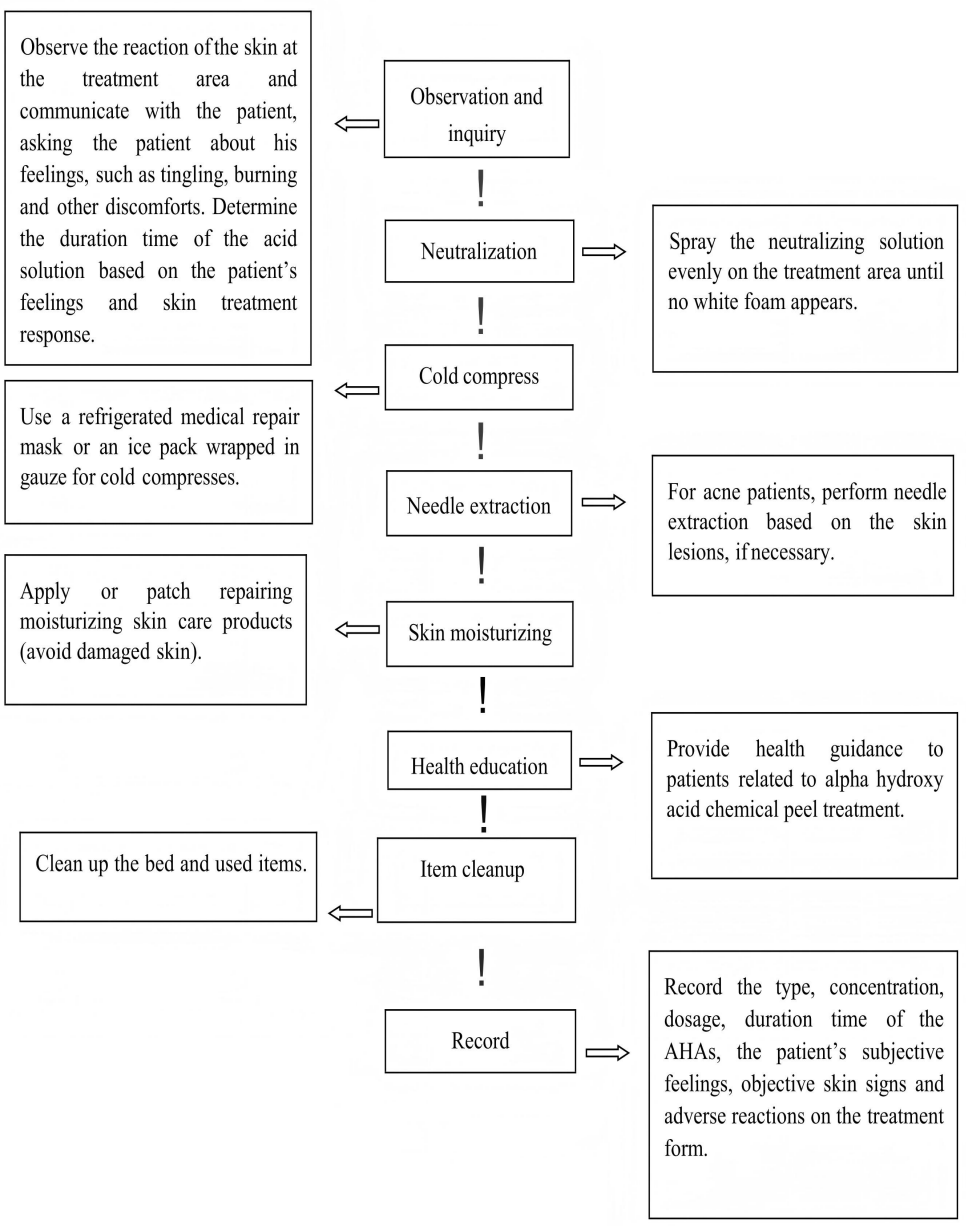
8.7. Postoperative follow-up

Conduct regular follow-ups via phone, SMS, or other means to obtain information about the patient's post-operative condition and provide corresponding health guidance. Instruct patients to follow the treatment course to achieve the best therapeutic effect (the interval of alpha hydroxy acid chemical peel treatments is generally 2 to 4 weeks, with 5 consecutive sessions constituting one course).

Appendix A (Normative)

Operational Flowchart of Alpha Hydroxy Acid Chemical Peel




Observation and inquiry
Observe the reaction of the skin at the treatment area and communicate with the patient, asking the patient about his feelings, such as tingling, burning and other discomforts. Determine the duration time of the acid solution based on the patient's feelings and skin treatment response.
Neutralization
Spray the neutralizing solution evenly on the treatment area until no white foam appears.
Cold compress
Use a refrigerated medical repair mask or an ice pack wrapped in gauze for cold compresses.
Needle extraction
For acne patients, perform needle extraction based on the skin lesions, if necessary.
Skin moisturizing
Apply or patch repairing moisturizing skin care products (avoid damaged skin).
Health education
Provide health guidance to patients related to alpha hydroxy acid chemical peel treatment.
Item cleanup
Clean up the bed and used items.
Record
Record the type, concentration, dosage, duration time of the AHAs, the patient's subjective feelings, objective skin signs and adverse reactions on the treatment form.

Appendix B (Informative)

Operational Score Table of Alpha Hydroxy Acid Chemical Peel

Name: Review Date: Scores:

Procedure	Total score	Operating requirements	A	B	C	D	Score
Appearance	4	Be decent and neatly dressed	4	3	2	1	
Assessment	9	1. Assess the patient's general information, including current and past medical history, drug allergy history, any contraindications to treatment, and the skin condition of the treatment area.	5	4	3	2	
		2. Assess the patient's background knowledge about alpha hydroxy acid chemical peels.	4	3	2	1	
Pre-operation	15	1. Wash hands and wear a mask.	3	2	1	0	
		2. Explain the treatment method, operation process, expected effects, precautions, and adverse reactions to the patient patiently, and sign the informed consent form.	3	2	1	0	
		3. Make sure the operating environment is clean and tidy, and that all supplies are fully prepared.	3	2	1	0	
		4. Take photos for archiving after cleansing the skin of the treated area with facial cleansing products.	3	2	1	0	
		5. Assist the patient to take a comfortable position to fully expose the treatment area.	3	2	1	0	
While-operation	53	1. Operators are required to wear gloves.	3	2	1	0	
		2. Use 75% ethanol or other effective cleansers to wipe the skin of the treatment area.	4	3	2	1	
		3. Apply erythromycin ointment or petroleum jelly on the skin of damaged parts and lips, corners of the mouth, both sides of the nose, inner and outer corners of the eyes, etc.	4	3	2	1	
		4. Cover the patient's eyes with moist gauze.	3	2	1	0	
		5. Select the appropriate type, concentration, and dosage of acid in the treatment dish based on the condition of the skin lesions.	5	4	3	2	
		6. Start the timer.	3	2	1	0	
		7. Use a brush to dip the acid and apply it to the treatment area. Generally, brush the "T-zone" first and the cheeks last. Apply the acid evenly, quickly, and gently from the inside to the outside (repeat the application appropriately on key areas).	5	4	3	2	
		8. Communicate with the patient during the operation, ask the patient about their feelings, and carefully observe the reaction of the skin on the treatment area.	4	3	2	1	
		9. Understand the endpoint reaction and determine the acid duration time. (1) For AHAs with a pH above 3.5: ① The ideal endpoint reaction of AHA is the appearance of slight erythema at the treatment site; ② If no erythema reaction occurs, it usually does not exceed 30 minutes. (2) For AHAs with a pH below 3.5: ① The ideal endpoint reaction is the appearance of mild erythema, slight stinging sensation, or scattered white frost on the skin of the treatment area; ② If the above situation does not occur, it usually does not exceed 5 minutes.	9	7	5	3	
		10. When the timing is over, take the neutralizing solution for neutralization. When spraying the neutralizing solution, be careful to protect the patient's eyes with cotton pads; The neutralization process can be repeated multiple times until no more foam is produced on the sprayed skin surface.	5	4	3	2	
		11. Use a medical repair mask (after refrigeration) or an ice pack wrapped in gauze for a cold compress. Acne patients should receive needle extraction treatment when necessary.	4	3	2	1	
		12. Apply moisturizing products (avoid damaged skin).	4	3	2	1	
Post-operation	9	1. Provide health guidance to patients.	3	2	1	0	
		2. Closely observe the adverse reactions of the skin in the operation area, such as redness, swelling, blisters, pigmentation, persistent numbness, etc., and take symptomatic treatment in time.	3	2	1	0	
		3. Arrange the items, wash hands, and record operations	3	2	1	0	
Evaluation	10	1. Correct operation method.	5	4	3	2	
		2. Patients respond well to treatment	5	4	3	2	
Total score	100						

Disclosure statement

The author declares no conflict of interest.

References

[1] Lee KC, Wambier CG, Soon SL, et al. Basic chemical peeling: Superficial and medium-depth peels. J Am Acad Dermatol. 2019;81(2):313-324.

[2] Wei B, Chen YM, Liu Y, et al. The clinical application of alpha hydroxy acids in dermatology. Chinese Journal of Aesthetic Medicine. 2017;26(1):40-43.

[3] Pan JH. Effect of glycolic acid on treatment of facial acne and related nursing details. Journal of Clinical Nursing in Practice. 2017;3(7):135-137.

[4] Habeshian KA, Cohen BA. Current issues in the treatment of acne vulgaris. Pediatrics. 2020;145(Suppl 2).

[5] Kang S, Fisher GJ, Voorhees JJ. Photoaging: pathogenesis, prevention, and treatment. Clin Geriatr Med. 2001;17(4):643-vi.

[6] Wilcock J, Savage Y. Just a cutaneous (keratotic) horn? BMJ. 2019;364.

[7] Elbuluk N, Grimes P, Chien A, et al. The pathogenesis and management of acne-induced post-inflammatory hyperpigmentation. Am J Clin Dermatol. 2021;22(6):829-836.

[8] Hesseler MJ, Shyam N. Platelet-rich plasma and its utility in the treatment of acne scars: A systematic review. J Am Acad Dermatol. 2019;80(6):1730-1745.

[9] Zhao YM, Xiang LH. Application of glycolic acid in dermatology. China Journal of Leprosy and Skin Diseases. 2016;32(8):500-504.

[10] Xu Z, Cao L. Investigation of the efficacy and safety in treating mild to moderate acne vulgaris with glycolic acid. Chinese Journal of Aesthetic Medicine. 2017;26(10):79-81.

[11] Chen FQ, Huang BB. Clinical application and progress of the fruit acid in dermatology. Journal of Practical Dermatology. 2015;37(3):156-158.

[12] Yang RY, Jiang X, Yang HL, et al. Experts' consensus on clinical application of chemical peeling. Journal of Practical Dermatology. 2019;12(5):257-262.

[13] Wang CM, Yu ML, Li HT, et al. Clinical observation and nursing of mild to moderate acne treated with fruit acid skin peeler. Journal of Practical Dermatology. 2017;10(3):175-176.

[14] Wang CM, Zhang L. *Skin Aesthetic Nursing Standard Operating Guidelines*. China Medical Science Press; 2016.

[15] Wang CM, Shen L, Guo LY. *Skin Aesthetic Nursing Operation Procedures.* China Medical Science Press; 2018.

[16] Wei J, Cheng PH, Jiang ZQ, et al. The Clinical Application of Alpha Hydroxy Acids in Cosmetic Dermatology. Chinese Journal of Aesthetic Medicine. 2017;26(9):125-128.

[17] Mohamed MM, Sabry HH, Salem RM. Treatment of atrophic acne scars: topical or intralesional plasma gel? Photodermatol Photoimmunol Photomed. 2022;38(1):29-37.

[18] Liu H, Yu H, Xia J, et al. Evidence-based topical treatments (azelaic acid, salicylic acid, nicotinamide, sulfur, zinc, and fruit acid) for acne: an abridged version of a Cochrane systematic review. J Evid Based Med. 2020;13(4):275-283.

[19] Cheng H, Liu J, Tian YJ, et al. Fruit acid peel combined with 420nm intense pulsed light in the treatment of moderate to severe facial acne. Chinese Journal of Aesthetic and Plastic Surgery. 2016;27(11):677-680.

[20] Liu H, Yu H, Xia J, et al. Topical azelaic acid, salicylic acid, nicotinamide, sulfur, zinc, and fruit acid (alpha-hydroxy acid) for acne. Cochrane Database Syst Rev. 2020;5(5).

[21] He GH, Yang HQ, Deng Y, et al. Clinical Observation of Alpha Hydroxy Acid Combined with Traditional Chinese

Medicine Facial Mask in the Treatment of Mild and Moderate Acne. Chinese Journal of Aesthetic Medicine. 2017;26(5):85-88.

[22] Lin XX, Zhang F, Wang YL, et al. Application of targeted nursing intervention in the treatment of facial acne vulgaris patients undergoing fruit acid peel. Journal of Qilu Nursing. 2017;23(9):93-95.

[23] Jian XL, Qin XL, Li H, et al. Efficacy evaluation of fruit acid peel in the treatment of 464 cases of mild to moderate acne vulgaris. China Journal of Leprosy and Skin Diseases. 2016;32(4):238-240.

[24] Robinson D, Friedmann D, Gordon J, et al. Efficacy and tolerability of a double-conjugated retinoid and alpha hydroxy acid cream in subjects with mild to moderate blemish-prone skin. J Drugs Dermatol. 2022;21(1):54-59.

[25] Liu HM. Discussion on the efficacy and safety of fruit acid peel in the treatment of acne. Dermatology and Venereology. 2019;41(4):591-592.

[26] Li CH, Huang YM, Ye J. Observation on the Short-term Efficacy of Alpha Hydroxy Acid Peeling Combined with Collagen Dressing in the Treatment of Mild and Moderate Acne Vulgaris. Chinese Journal of Aesthetic Medicine. 2019;28(11):53-57.

[27] Chen Y, Wang WL, Tao TJ. Clinical application of Melasma With Q-Switched 1,064 nm Nd:YAG Laser Laser Versus Combined Laser and Glycolic Acid Peeling. Medical Journal of Liaoning. 2019;33(1):46-50.

[28] Chen YJ, Huang LN, Su L, et al. Observation of the efficacy of fruit acid peel combined with comedo extrusion in the treatment of facial acne vulgaris. Journal of Clinical Dermatology. 2017;46(11):803-806.

[29] Wang XY. Efficacy observation and nursing analysis of fruit acid peel in the treatment of mild to moderate acne. World Latest Medicine Information. 2019;19(19):265.

[30] Wei J, Cheng PH, Jiang ZQ, et al. The Clinical Application of Alpha Hydroxy Acids in Cosmetic Dermatology. Chinese Journal of Aesthetic Medicine. 2017;26(9):125-128.

[31] Xia J, Zhang Q, Li YF, et al. Two cases of adverse reactions after fruit acid treatment and coping strategies. Journal of Clinical Dermatology. 2020;49(3):165-167.

[32] Xing QQ, Cheng PH. The new progress of pathogenesis of acne rosacea and individualized treatment. Huaxia Medicine. 2018;31(2):176-178.

[33] Zhou LH, Wang CY, Lu W. Observation on Clinical Efficacy after Treatment of Female Acne Scar By Intense Pulsed Light Combined with Fruit Acid. Chinese Journal of Aesthetic Medicine. 2020;29(8):56-58.