

Jessner's Solution

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The author has no financial interest in any of the products or equipment mentioned in this chapter.

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3.1 History

Jessner's Solution has been used for over 100 years as a therapeutic agent to treat hyperkeratotic epidermal lesions [1]. This superficial peeling agent constitutes a mixture of salicylic acid, resorcinol, and lactic acid in 95% ethanol. Jessner's solution causes loss of corneocyte cohesion and induces intercellular and intracellular edema. Jessner's typically induces wounding to the level of the papillary dermis. Historically, resorcinol (a key component of Jessner's peels) was used in concentrations of 10–50% in the early twentieth century. High concentrations of resorcinol were associated with side effects such as allergic contact dermatitis, irritant contact

dermatitis, and skin discoloration. Subsequently, Jessner's solution was formulated by Dr. Max Jessner to lower the concentrations of any one agent contained in the mixture and to enhance its overall effects as a keratolytic agent.

3.2 Chemical Background

Each component of Jessner's solution has specific effects (Fig. 3.1). Salicylic acid (ortho hydroxy benzoic acid) is a beta hydroxy acid agent

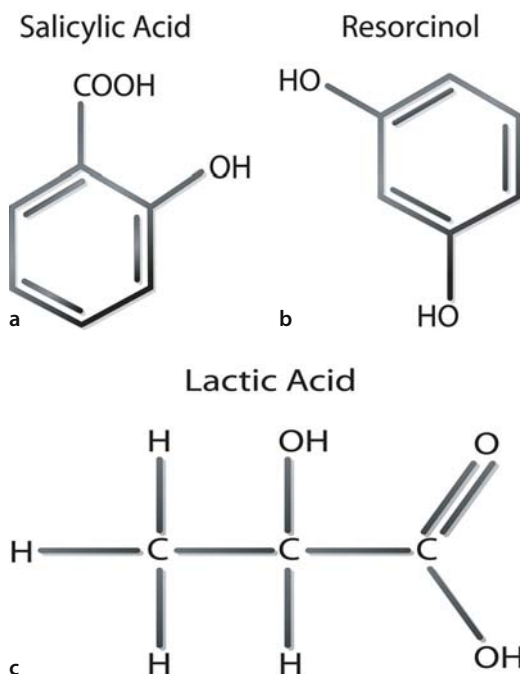


Fig. 3.1a–c. Chemical structures of Jessner's Peel components (a Salicylic acid, b Resorcinol, and c Lactic acid)

[2]. It is a lipophilic compound which removes intercellular lipids that are covalently linked to the cornified envelope surrounding epithelial cells [3]. It also enhances penetration of other agents. Resorcinol (m-dihydroxy benzene) is structurally and chemically similar to phenol. It disrupts the weak hydrogen bonds of keratin [4]. Lactic acid is an alpha hydroxy acid which causes corneocyte detachment and subsequent desquamation of the stratum corneum [5].

3.3 Formulations

The standard formulation of Jessner’s solution is listed in Table 3.1. Modified Jessner’s solutions that do not contain resorcinol are also available (Delasco, Council Bluffs, IA) (Table 3.2).

Table 3.1. Preparation of Jessner’s Solution with resorcinol

Resorcinol 14 g
Salicylic acid 14 g
Lactic acid (85%) 14 g
Ethanol (sufficient quantity to make 100 mL)

Table 3.2. Modified Jessner’s Solution

17% lactic acid
17% salicylic acid
8% citric acid
Ethanol (sufficient quantity to make 100 mL)



Fig. 3.2. a Patient with acne with excoriation. b Patient after treatment with three Jessner’s peels

3.4 Indications

Jessner's peels have been used to treat acne, melasma, post-inflammatory hyperpigmentation, lentigines, freckles, and photodamage (Figs. 3.2a, b, 3.3a, b and 3.4a, b).

3.5 Contraindications

As with other superficial peeling agents, Jessner's peels are well tolerated with few contraindications. However, there is scant pub-

lished information on the use of Jessner's peels in Fitzpatrick's skin types V and VI. In the author's experience, Jessner's peels are also well tolerated in these groups. General contraindications include active inflammation, dermatitis, or infection of the area to be treated; isotretinoin therapy within 6 months of peeling; and delayed or abnormal wound healing. Jessner's peels are also contraindicated during pregnancy. Allergies to resorcinol, salicylic acid, or lactic acid are absolute contraindications. Patients should not have unrealistic expectations regarding peel outcomes.



Fig. 3.3. **a** Patient with post-inflammatory hyperpigmentation. **b** Patient after treatment with a series of two Jessner's peels



Fig. 3.4. a Patient with melasma. b Patient after treatment with Jessner's peeling

3.6 Skin Preparation

The general goals of preparing the skin for peeling are to maximize peel outcomes while minimizing the potential to develop post-peel complications. A detailed history and cutaneous examination should be performed prior to chemical peeling. Baseline full-face frontal and lateral photos are recommended. Skin preparation for Jessner's peeling includes the use of bleaching agents, topical retinoids, alpha hy-

droxy acids, and/or other topical exfoliating agents. However, as with other superficial peeling agents, the patient's diagnosis influences how the skin should be prepared for the peeling procedure. Skin preparation can impact penetration of the peeling agent and the overall efficacy of the peel. In addition, peel preparation can increase or decrease the potential to develop post-peel complications.

Use of topical retinoids (tretinoin, tazarotene, retinol formulations) for 2–6 weeks prior

to peeling thins the stratum corneum and enhances epidermal turnover [6]. Such agents also reduce the content of epidermal melanin and expedite epidermal healing. Retinoids also enhance the penetration of the peeling agent. They should be discontinued several days prior to the peeling procedure. Retinoids can be resumed post-operatively after all evidence of peeling and irritation subsides. When treating conditions such as melasma, acne, and post-inflammatory hyperpigmentation, as well as darker skin types, retinoids should be discontinued 1 or 2 weeks before peeling or even eliminated from the prep to avoid post-peel complications such as excessive erythema, desquamation, and post-inflammatory hyperpigmentation. Topical alpha hydroxy acid or polyhydroxy acid formulations can also be used to prep the skin. In general, they are less aggressive agents in impacting peel outcomes. The skin is usually prepped for 2–4 weeks with a formulation of hydroquinone 4% or higher compounded formulations (5–10%) to reduce epidermal melanin. This is extremely important when treating the aforementioned dyschromias. Although less effective, other topical bleaching agents include azelaic acid, kojic acid, arbutin, and licorice (see photoaging section). Patients can also resume use of topical bleaching agents post-operatively after peeling and irritation subsides [7, 8]. Broad-spectrum sunscreens (UVA and UVB) should be worn daily (see Photodamage, Sunscreen section).

3.7 Peeling Technique

The skin is usually degreased with alcohol followed by a mild acetone scrub. After cleaning, Jessner's solution is applied to the face with a sable brush, cotton tipped applicators, cotton balls, or 2 × 2 gauze sponges. The author prefers the use of cotton tipped applicators. Typically, the cheeks are treated first, working from medial to lateral areas followed by application to the chin and forehead area. For superficial peeling, two coats are usually applied. Additional coats increase the depth of peeling.

Neutralization or dilution with Jessner's solution is not indicated. After application of product, some visible precipitate may appear on the skin surface. This should be distinguished from true frosting which correlates with the depth of peeling. Extent of erythema and desquamation following a Jessner's peel correlates with extent of and type of pre-peel prepping, number of coats of product applied, and level or degree of frosting during the procedure [7].

3.8 Post-peel Care

Use of bland cleansers and moisturizers is essential. Recommended moisturizing agents include Cetaphil, SBR-Lipocream, or Aquaphor. Peeling related to Jessner's usually resolves in 2–7 days. Patients can resume the use of general skin care products after peeling subsides. Makeup can be worn to camouflage peeling. Excessive peeling, erythema, or irritation post-peel can be treated with low or mid- to high-potency steroids for 5–7 days. Use of such agents should be based on the extent of irritation and inflammation.

3.9 Advantages of Jessner's Peeling

- Excellent safety profile
- Can be used in all skin types
- Substantial efficacy with minimal "down time"
- Enhances the penetration of TCA

3.10 Disadvantages of Jessner's Peeling

- Concerns regarding resorcinol toxicity, including thyroid dysfunction
- Manufacturing variations
- Instability with exposure to light and air
- Increased exfoliation in some patients

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3.11 Side Effects

Despite concerns regarding resorcinol and salicylate toxicity, Jessner’s solution has been extremely well tolerated with minimal side effects. Allergic reactions to resorcinol are reported to be rare [9, 10]. Although the potential to induce thyroid disease has been reported, a recent toxicological review on the risk of resorcinol in inducing thyroid abnormalities did not support an association [9]. However, resorcinol administered at high doses to rodents can disrupt thyroid hormone synthesis and can produce goitrogenic effects. Clinical case reports from patients undergoing resorcinol therapy for dermatological indications reveal thyroid side effects in instances where copious amounts of resorcinol-containing ointments are applied to integrity-compromised skin for months to years. However, a risk assessment comparing potential worst-case exposures to resorcinol through its use in dermatological preparations supports the conclusion that under real-life conditions, human exposures to resorcinol are not expected to cause adverse effects on thyroid function [9]. In addition, we are aware of no case reports of salicylism from Jessner’s formulation. Resorcinol has also been implicated in the induction of exogenous ochronosis in Africa. However, resorcinol has not been implicated in the rare cases of ochronosis in the United States [11].

3.12 Patient’s Informed Consent

I, _____, hereby consent to having my _____ (site) treated with CHEMICAL PEELING USING JESSNER’S SOLUTION. Jessner’s peeling is often used to treat photodamage (sun-damaged skin), hyperpigmentation (dark spots), texturally rough skin, acne, and scarring. It is a peeling agent which causes shedding of the outermost layer of the skin, the stratum corneum.”

The procedure involves first having the peel site prepped with alcohol, acetone or other

pre-peel cleansing agents. The peel is then applied. In general, Jessner’s peels are extremely well tolerated. However, the procedure can cause redness, flaking, dryness, or irritation in the area to be treated. The effects could last for 1–2 weeks.

I understand that there is a small risk of developing permanent darkening or undesirable pigment loss at the treated site. There is a rare chance that a scar could develop. There is also a small risk that a bacterial infection could develop or there could be a flare of a pre-existing Herpes infection at the treated site, or the condition being treated could worsen after the peeling procedure. The benefits and side effects of the procedure have been explained to me in detail. All of my questions have been answered.

- I am in stable health.
- I have not used Isotretinoin in the past 6 - months.
- I have no allergies to resorcinol, salicylic acid, or lactic acid.
- I am not pregnant.

Outcomes are not guaranteed.

Signature of Patient

Date

Patient Name (Please Print)

Witness

Date

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