Jessner’s + trichloroacetic acid 35% solution medium depth peel technique

Seaver Soon
Division of Dermatology & Dermatologic Surgery
Scripps Clinic, La Jolla, CA
No conflicts of interest
Medium depth chemical peel

• Wound to the level of the papillary or upper reticular dermis
  • actinic keratosis
  • dyschromia
  • sallow discoloration
  • fine wrinkling

• Historically
  • TCA 50% solution
  • Penetration of solution unpredictable, risk of scarring

• Similar wounding and clinical results achieved consistently and safely by first inducing epidermolysis with a physical or superficial peeling agent, followed by application of TCA 35%
  • Solid CO2 + TCA 35% (Brody)
  • Jessner’s solution + TCA 35% (Monheit)
  • Glycolic acid 70% + TCA 35% (Coleman)
Jessner’s solution

- Classic Jessner’s solution
  - 14g resorcinol
  - 14g lactic acid
  - 14g salicylic acid
  - q.s. 100mL ethanol

- Modified Jessner’s solution
  - 8g citric acid
  - 17g lactic acid
  - 17g salicylic acid
  - q.s. 100mL ethanol

- Modified Jessner’s avoids resorcinol, which may be associated with contact allergy, thyroid toxicity, and hyperpigmentation in phototypes IV-VI

- Induces corneocyte dyscohesion, intercellular edema and cleavage of the stratum corneum above the stratum granulosum

- Clinical endpoint
  - Erythema
  - Reticulate frost (precipitation of salicylic acid crystals)
Trichloroacetic acid

- Available as United States Pharmacopeia (USP) TCA crystals
  - Prepare by weight to volume method to ensure consistency
  - TCA 35% = 35g USP TCA crystals q.s. distilled water 100mL

- Clinical endpoint: solid white frost
  - Keratin denaturation and coagulative necrosis of dermal collagen and elastin
  - Neutralized by serum of papillary dermis
    - ‘neutralization’ with NaHCO3 unnecessary

- Different concentrations may be used to achieve different levels of histologic injury
  - 10-35% superficial peel
  - 50% medium peel
  - 90-100% deep peel
What are the histologic effects of medium depth peels?
**Photo-aged mouse model**

**A**: photo-aged control  
**E**: TCA 50%

**Collagen**

A. Loss of collagen birefringence = collagen microfibril structural disarray in papillary dermis

E. Polarized light shows collagen fiber birefringence  
   • horizontal compact bundles

**Elastin**

A. Verhoeff stain demonstrates elastosis in papillary and reticular dermis

E. Replacement of elastosis with dense horizontal, network of fine elastic fibers

**Compact epidermis with normalized polarity**

*Plast Reconstr Surg 2001; 107:222-8*
Medium depth chemical peels induce glycosaminoglycan synthesis in the papillary and upper reticular dermis: colloidal iron stain
Medium depth chemical peels induce formation of a Grenz zone of collagen above pre-treatment regions of solar elastosis

Day 0

Day 90

Practical tips

4 weeks preparation
• Topical retinoid over moisturizer
• Sun protection

Day of procedure
• Valacyclovir 1g TID x 7 days

Post-procedure
• Dilute vinegar compress four times daily x 1 day
• White petrolatum TID x 3 days, then change to emollient cream TID
  • *Pain, malaise, pustules*: bacterial culture; empiric trimethoprim-sulfamethoxazole BID and gentamicin 0.1% cream TID x 7 days
  • *Itch, pustules*: candidal culture; empiric fluconazole 200mg x 1 dose
  • *Induration*: topical or intralesional steroid
• Sun protection; do not peel exfoliation, may cut using scissors
• If not healed in 7 days, may be a problem!
Summary

• Jessner’s followed by TCA 35% solution is a medium depth chemical peel and treats brown dyschromia, sallow discoloration and fine wrinkling

• Results on face more predictable and safer than on neck, trunk and extremities

• Associated with increased collagen, elastin, dermal mucin and ‘grenz zone’ of papillary dermal fibroplasia

• Use of appropriate pre-peel and post-peel care, application technique with clinical endpoints, and recognition of common complications may optimize outcomes
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