

Dermatology Winter Symposium

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The use of laser, intense pulse light and radiofrequency for non- ablative skin rejuvenation

Speaker: Dr. H.H.L. Chan
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The objectives of non-ablative skin rejuvenation are reduction of pigment and wrinkles. Asian skin, a darker skin type, is different from Caucasian skin in two ways. Firstly, Asian skin is prone to post-inflammatory hyperpigmentation (PIH) after laser therapy. Secondly, the superficial pigmentation acts as a barrier to absorption of laser. Removing pigment is often the aim of treatment in our population, but one has to clarify it with the client as this will affect the choice of laser.

The options for pigmented lesion comprise 510 nm pulsed dye laser, Q-switched (QS) 694 nm ruby, QS 755 nm alexandrite, long pulse 532 nm Nd-YAG, QS 532 nm Nd-YAG, and intense pulsed light (IPL). 510 nm pulse dye laser is not popular anymore. If the fluence is low, both QS Ruby and QS Alexandrite lasers have high rate (about 20%) of PIH in Asian skin due to stimulation of follicular melanocytes. Both long pulse 532 nm Nd-YAG and QS 532 nm Nd-YAG work well, but their

actions were different. While the long pulse 532 nm Nd-YAG has photothermal effect, QS 532 nm Nd-YAG has both photothermal and photomechanical effects. This photomechanical effect of QS 532 nm Nd-YAG may cause PIH and is indeed undesirable. IPL is another example of having pure photothermal effect and therefore lower risk of PIH.

The laser for wrinkle reduction ideally should have long wavelength because shorter wavelength laser may interfere with epidermal pigment. Other ideal features are adequate epidermal cooling, no down-time, long-term effect, and a user-friendly system. The reduction of wrinkles can be assessed by patient's subjective judgment on skin texture, cutanometer on elasticity, and histology. Surprisingly, there is epidermal thinning after IPL treatment. It is postulated that dermal injury can cause epidermal change through communication through cytokines.

Different models of IPL were discussed. Vasculight IPL, the first generation, can reduce pigment as well as wrinkles. IPL Quantum is the second generation that requires more treatment sessions for pigment reduction because its epidermal cooling is so good that it offsets all photothermal injury to the pigment. Ellipse IPL has improved selectivity. By applying a water filter, it can reduce non-selective thermal injury.

Radiofrequency (RF) causes electron movement and heat. This bulk heating of skin shrinks the collagen and increases fibroblastic activity. Radiofrequency can be unipolar or bipolar. Unipolar RF penetrates deeper than the bipolar

one. It goes as deep as 7 mm in the skin and has been well proven for its efficacy in photo-rejuvenation. The effect of bipolar RF is less well proven, but it may work well in combination with IPL.

Despite the advances in IPL, one should not forget the other treatment modalities that may also maintain the long-term effect of rejuvenation. These include chemical peeling, micro-dermabrasion, Botox injection, filler injection, laser, and other surgical procedures.

Learning points:

Reducing pigment and wrinkles are the two major objectives in non-ablative skin rejuvenation. These can be achieved by laser, intense pulse light or radiofrequency device.

Chemical peel

Speaker: Dr. S.Y. Yip

Honorary Associate Professor, Department of Medicine, The University of Hong Kong

Chemical peels are classified by the depth of the procedure. The more superficial ones induce epidermal exfoliation only. Chemical peeling can suppress melanin formation, increase epidermal and dermal thickness, and stimulate the production of collagen, elastin and glycosaminoglycans ground substance. These will result in smoother, whiter, firmer and more elastic skin.

Before chemical peeling, one has to take a detailed history on the patient's lifestyle such as sun exposure, cosmetic use and smoking habit, past medical history and drug intake, prior skin disease and cosmetic surgery, plus any keloidal tendency. A baseline assessment of patient's face is also necessary under the following parameters: degree of pigmentation, actinic damage, oiliness, thickness, firmness and laxity.

Commonly employed chemical peeling agents are trichloroacetic acid 15-35%, α - or β -hydroxy acids, and Jessner's solution which contain resorcinol, salicylic and lactic acid in ethanol. The depth of wounding during chemical peeling was determined by the type, strength and amount of agent used plus the technique of operator. The target depth of peeling has to be personalised and depends on the skin pathology and its depth, and skin thickness of individual patient. Pre- and post-peeling skin conditioning involve sun protection with sunscreen and physical barriers, use of cleansing lotion and toners, depigmenting agents such as hydroquinone and azelaic acid, vitamin A derivatives such as tretinoin and adapalene, plus vitamin C and E. Possible complications of chemical peeling include prolonged erythema, exfoliation, milia formation, acne flare, wound infection, delayed healing, scarring, pigmentary changes etc. Deeper peeling which involves mid-reticular and deep dermis tends to have higher risk.

Learning points:

Chemical peeling is a cosmetic procedure which can improve skin colour, texture and appearance. However, careful history taking and pretreatment assessment plus pre- and post-procedure skin care are important for successful results. One also has to bear in mind the possible complications.

Contact dermatitis due to cosmetic and skin care product

Speaker: Dr. T.Y. Lee

Honorary Associate Professor, Department of Medicine, The University of Hong Kong

The prevalence of contact dermatitis varies with time and place, as there are differences in customs and habits of cosmetic use. A prevalence of 5.4% has been reported in all patch-tested patients in the United States. In Hong Kong, a clinic-based

study by the speaker revealed 6.5% of those patch-tested were allergic to cosmetics which ranked fourth in the causes of contact dermatitis. Adverse reactions to cosmetics include contact dermatitis, contact urticaria, pigmentary changes, acneiform eruptions and changes in hair and nail. The following discussions concentrate on contact dermatitis to cosmetics.

Fragrance is the commonest cause for contact dermatitis. It is present in perfumes and other skin care products. A local survey in Hong Kong shows 19.5% of contact dermatitis patients have fragrance mix allergy. Preservatives are the second most common culprit. Preservatives are used to prevent growth of microorganisms and include kathon CG, thimerosal, formaldehyde, quaternium-15, parabens and imidazolidinyl urea. Of these, a prevalence of 8.9% for kathon CG and 6.7% for thimerosal were found in a small-scale survey done by the speaker in 1998 in Hong Kong.

Lanolin is a mixture of esters and polyesters of high molecular weight alcohol and fatty acids. It is used as an emollient and emulsifier in cosmetics. It is an important sensitiser in skin with preexisting eczema. However, it is usually harmless to normal skin. Anti-aging and bleaching agents contain alpha-hydroxy acids, beta-hydroxy acids and retinoids. They are, therefore, potential irritants to the face. Hair products with allergic potential include hair permanent, which is used to change hair configuration, and hair dyes. The five common dyes are permanent, semipermanent, temporary, vegetable, and metallic hair dyes. Only the first two dyes are common causes of contact dermatitis. *p*-Phenylenediamine is commonly used in permanent hair dyes. It is packaged to the customers as monomers, which form polymers after reaction with hydrogen peroxide. Sensitisation can be apparent only after few months to years because it is used as a rinse-off product. Temporary tattoos seldom cause contact dermatitis, but when it occurs, the darker colour dyes are usually responsible as they contain *p*-Phenylenediamine.

Treatment of contact dermatitis entails symptomatic therapy with topical steroid, oral antihistamine and identification of the culprit. A thorough history is important to identify the most likely source. Patch test or photopatch test can be used for suspected allergic contact or photocontact dermatitis. If the results are negative but the culprit is strongly suspected, open test and use test can be done.

Learning points:

Patch test is necessary in the management of contact dermatitis, as clinical features can be misleading. Identification of the culprit is important, as contact dermatitis is potentially curable.

Botox and fillers

Speaker: Dr. F.W.Y. Ho

Specialist in Plastic Surgery, St. Teresa's Hospital, Hong Kong

A number of factors account for the changes of facial aging. These include wrinkles, loss of elasticity, gravity, soft tissue loss and bone loss. Management of facial aging is oriented towards the underlying changes. Documentation with clinical photography is also warranted. Approaches employed for anti-aging management include a wide variety of skin care products, intense pulse light, botulinum toxin injection, fillers, non-ablative laser therapy, radiofrequency resurfacing, liposuction and face lift. The following discussion concentrates on fillers and botulinum toxin injection.

Fillers can be employed for correction of wrinkles due to static change in skin and subcutaneous tissue. It can also be used for augmentation in facial enhancement. Permanent fillers include polyacrylamide, artecoll and silicone. Since it is permanent, any problems such as over-correction and misplacement are difficult to treat. Therefore temporary fillers are more popular. Temporary

fillers include collagen, hyaluronic acid and polylactic acid. Collagen can be derived from either bovine or human sources. Skin test is mandatory for bovine collagen before its use to rule out sensitivity but is not necessary for human collagen. Hyaluronic acid is naturally present in skin for elastic support and lubrication but its quantity decreases with aging. Hyaluronic acid fillers are popular as they are temporary fillers, impart a natural feel and carry low risks of allergic reaction.

Wrinkles can be divided into several categories according to the underlying cause. Fine wrinkles are attributable to changes in the epidermis and dermis. Dynamic wrinkles are more prominent on muscle contraction and are secondary to 'hyperdynamic' muscles. Static wrinkles are due to atrophic changes in skin, subcutaneous tissue or muscles. Botulinum toxin acts by blocking the release of acetylcholine from peripheral nerve endings. It can be used in the management of wrinkles, facial enhancement and hyperhidrosis.

The type of wrinkles that is responsive to botulinum toxin injection belongs to the dynamic group. In order to have the desirable effect, knowledge on the anatomy of facial muscles is of utmost importance. Its effect on brow furrow improvement starts as early as the first week of treatment but the effect will be reduced in the next sixteen weeks. Repeated injection is necessary to maintain the clinical effect. Other examples of dynamic wrinkles are the crow's feet and forehead lines. The toxin can also be used for facial enhancement. Examples are eyebrow enhancement (to uplift the eyebrow) and square jaws that are secondary to excessive masseter muscle contraction.

Learning points:

It is essential to know the underlying changes causing the appearance of facial aging before one can choose a suitable therapy.