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Reports on Scientific Meetings

3rd Regional Conference in Dermatological Surgical Laser and Facial Cosmetic Surgery 2008 (Part II)

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Reports on Plenary Lectures

Periocular rejuvenation and epicanthoplasty

Speaker: Professor Dae-hwan Park
Professor and Chairman, Department of Plastic Reconstructive Surgery, Catholic University of Daegu, Daegu, Korea

There are differences between Asians and Caucasians with respect to ethnic, cultural backgrounds and anatomy of the periocular regions. More subcutaneous fat around periocular region is found in Asians compared with Caucasians. Many methods which can be further divided into non-invasive and invasive can be used in periocular rejuvenation. Non-invasive methods include chemical, mechanical or space filling. Invasive methods include upper and lower blepharoplasties, incisional oriental double-eyelid restoration, medial and lateral epicanthoplasty, transconjunctival lower lid blepharoplasty, suprabrow, and subbrow lift. Twenty years experience in 2000 cases of periocular rejuvenation and 500 cases of epicanthoplasties from 1986 to 2006 were presented. The results were good with minimal scarring. Careful preoperative evaluation, skillful operative technique and appropriate management are most important for the successful outcome.

Learning points:
Epicanthoplasty is one of the surgical methods for periocular rejuvenation.

Laser lipolysis

Speaker: Dr. Robert Weiss
Director, Maryland Laser, Skin and Vein Institute, Baltimore, USA

Laser lipolysis is one of the advanced methods for remodeling of the body contour. The method is to use laser beam to melt the subcutaneous fat followed by liposuction to facilitate the removal of the fatty tissue. The mechanism is thought to be a combination of photoacoustic and photothermal effects of the laser energy. The standard protocol for laser lipolysis is to apply 10 watts or higher power for 1-5 minutes. Laser assisted lipolysis has several advantages including liquification of fat to facilitate removal, shrinking the fat volume by fat transforming from solid to liquid, reducing blood loss, bruising and pain and hence resulting in shorter recovery time and more rapid clinical response. There are several disadvantages including a longer procedure time,

separate cycles of fat melting and liposuction, skin injury, burning and fiber breakage. The author compared the fat melting process by using lasers of different wavelength including 1064 nm, 1320 nm and 924 nm. The laser fiber was distributed uniformly in a windshield wiper motion throughout the fat samples by the operator. The median time for sampling was 3 minutes for 1064 nm, 1.5 minutes for 1320 nm and 0.75 minutes for 924 nm. As a result, the wavelength of 924 nm was most efficient at melting fat at equal fluence compared with 1320 nm and 1064 nm. Moreover, 924 nm could achieve better thermal optical selectivity in subcutaneous fat. In conclusion, laser assisted lipolysis is an effective method for fatty tissue removal.

Learning points:
Laser lipolysis is an effective treatment for fatty tissue remodeling by using laser energy followed by liposuction.

Advances in aesthetic dermatology

Speaker: Dr. Dieter Manstein
Instructor in Dermatology, Wellman Center for Photomedicine, Harvard Medical School, Boston, USA

The technology of fractional photothermolysis (FP) is increasingly applied in dermatology. Alternatives to laser-based devices such as radiofrequency, acoustic technologies have been emerging in aesthetic dermatology. Some of these energy sources are also delivered in the fractional manner. Treatment of cellulite for body contouring using non-invasive modalities like radiofrequency and ultrasound is also a new area for research and development. Selective cryolysis of fatty tissue, which involves controlled application of cold in a manner vastly different than conventional cryosurgery is another novel concept under research and development.

Learning points:
Recent advances in aesthetic dermatology include the concepts of fractional photothermolysis and fractional application of radiofrequency and ultrasound technologies.

Lasers and light sources for the treatment of vascular skin lesions – a hotbed of new developments?

Speaker: Professor Stuart Nelson
Professor of Surgery and Biomedical Engineering, Beckman Laser Institute and Medical Clinic, University of California, Irvine, USA

The target chromophore for vascular lesions is haemoglobin. The radiant energy produced by lasers and light sources is preferentially absorbed by haemoglobin and converted to heat which results in thermal damage and vessel thrombosis. Lasers and light based therapies can be used to treat a wide variety of vascular skin lesions including port wine stains, capillary haemangiomas, cherry angiomas, venous lakes, post-traumatic scars, poikiloderma of Civatte, angiokeratoma, spider angiomas and telangiectasias.

Learning points:
One should be aware of the variety of optional therapies for vascular skin abnormalities, their efficacies and their potential complications.

Facelifts – how I do it

Speaker: Professor Luiz Toledo
Professor in Plastic Surgery, Department of Plastic Surgery, International Modern Hospital, Dubai, United Arab Emirates

Professor Toledo shared his working experience in his affiliated Hospital in UAE. About 83% of plastic and aesthetic surgeries were performed in females. The most common procedure was lipoplasty and second most common was rhinoplasty. In the process of aging, there is displacement of infraorbital skin with resulting bags, dark circles and excess skin or puffy appearance of the upper eyelids. Blepharoplasty can benefit adults of all ages including those with inherited trait of sagging or drooping eyelids in their twenties and thirties. The type of procedure performed depends on the specific problem – for example if only the upper eyelid is affected, there is no need to operate on lower eyelid; if the problem is only caused by excess fat, there is no need to remove skin and vice versa. Old methods of rhytidoplasty that involve stretching of skin will make the contour unnatural. Newer procedures employ the technique of removing excess skin and superficial musculo-aponeurotic system (SMAS) injection.

In usual situations, however, a patient in her forties or fifties with drooping upper eyelids and puffy bags in the lower eyelids will be required to remove excess fat, skin and muscle during blepharoplasty. A forehead lift is recommended if the upper eyelid problem is accompanied by sagging of eyebrows. A chemical peel for dark pigmentation around eyes may be necessary. Crow's feet can be treated with botulinum toxin injection and laser resurfacing.

The surgical incision for facelift was made at the hairline of the temple, in front of or partially within the tragus, around the earlobe, in retroauricular crease and into lower scalp according to specific procedure and patient preference.

Learning points:
A surgical facelift in combination with other modalities such as botulinum toxin injection and laser resurfacing can achieve maximum results in skin rejuvenation.

Recent advances in fat grafting

Speaker: Dr. Sydney Coleman
Clinical Assistant Professor, Department of Plastic Surgery, NYU Medical Center, New York, USA

The use of filler injections dated back to the early 1900s. The treatment was targeted at major facial defects. Fat had been used as structural filler for grafting for a long period of time. The transplanted fat not only adjusted body contour but also structural rejuvenation and change of quality of surrounding skin were observed. The quality of aging skin and scar was notably improved after fat grafting. Improvement in condition such as radiation damaged skin, chronic ulcers, breast capsular contracture and damaged vocal cords were also noted by many clinicians. One example is use of fat grafting in the treatment of radiation damaged breast after surgery and irradiation of breast cancer. Significant improvement of the damaged breast skin was observed.

After harvesting fat tissue with a blunt cannula, the fat was centrifuged to produce different layers of fat tissue. Each layer had a different composition of cells and cellular matrix including various cytokines that possibly have significant effects on the observed skin quality improvement. The underlying mechanism may be related to adipose derived stem cells. Further researches are however required to elucidate this theory.

Learning points:
Fat grafting has been observed to improve damaged and aging skin in various aspects. The exact role of fat derived stem cells needed to be elucidated.

Reports on Symposiums

A) Photodynamic therapy

Photodynamic therapy for skin rejuvenation

Speaker: Dr. Michael Gold
Clinical Assistant Professor, Department of Dermatology, Vanderbilt University School of Medicine and Vanderbilt University School of Nursing, Nashville, USA

Photodynamic therapy (PDT) is one of the standard treatments for photorejuvenation. It can be used to treat actinic keratoses and other features of photodamage to the skin. Topically applied 5-aminolevulinic acid (ALA) is preferentially taken up by cells in actinic keratoses and converted to protoporphyrins. Exposure to light source activates protoporphyrins to produce free oxygen radicals resulting in destruction and damage of cells in lesional sites. The treated lesion of actinic keratoses usually resolved one month after PDT. Good cosmetic appearance was found in 94% of treated cases. Besides improving features of actinic keratoses, ALA-PDT can also improve features of photodamage including pigmentation, wrinkles and textural change. The main side effect of ALA is allergic contact dermatitis. Post treatment erythema is common. Exposure to sunlight should be avoided within 24-36 hours after PDT.

Learning points:
Photodynamic therapy (PDT) is a treatment option for actinic keratoses and photorejuvenation.

Photodynamic therapy for the treatment of acne

Speaker: Dr. Chi-keung Yeung
Associate Consultant, Department of Medicine, Queen Mary Hospital, Hong Kong SAR

Acne vulgaris is a common dermatological disorder. The pathogenesis involves overactivity of the sebaceous gland and blockage of the hypercornified duct. The pilosebaceous apparatus is usually colonized by microorganisms such as *Propionibacterium acnes* (*P. acnes*), which may be responsible for the conversion of sebum into irritant and comedogenic free fatty acids. The conventional therapies include topical treatments such as topical clindamycin, benzyl peroxide, retinoic acid and systemic treatments such as oral antibiotic, hormonal pills with anti-androgenic effects and isotretinoin. Besides the conventional therapies, photodynamic therapy (PDT) has its role in the therapeutics of acne. The mechanism involves the destruction of *P. acnes* through targeting endogenous porphyrins and damaging the sebaceous glands. Topically applied 5-aminolevulinic acid (ALA) or methyl ester of aminolevulinic acid (MAL) is preferentially taken up by sebaceous glands and converted to protoporphyrins IX (PpIX). Exposure to light source activates PpIX to produce free oxygen radicals resulting in destruction of *P. acnes* and damage of sebaceous glands. Clinical trials have demonstrated the effectiveness of PDT after 1-3 treatments for facial and back acne with improvement for up to 1 year. The efficacy of PDT in acne vulgaris is about 30-60%. The major adverse effects are pain, erythema, photosensitivity, gastrointestinal upset, post-inflammatory hyperpigmentation and herpes reactivation. The adverse reactions can be minimized by short contact ALA, 30 minutes-2 hours, however, without compromising the efficacy. In conclusion, PDT can be a viable option for treating moderate to severe inflammatory acne especially for those patients who develop intolerance or failure to topical or oral medications.

Learning points:
Photodynamic therapy (PDT) is a viable treatment option for moderate to severe inflammatory acne in addition to conventional therapies.

Photo-chemotherapy of hypervascular skin lesions: an alternative to photothermal therapy?

Speaker: Professor Stuart Nelson
Professor of Surgery and Biomedical Engineering, Beckman Laser Institute and Medical Clinic, University of California, Irvine, USA

Port wine stain (PWS) is a common vascular disorder. The target chromophore is haemoglobin. Pulsed dye laser (PDL) is one of the standard treatments. However, the response is unpredictable because the size and depth of blood vessels are highly variable resulting in unpredictable laser tissue interaction. The mean successful rate for complete clearance is below 25%. Photochemotherapy or photodynamic therapy (PDT) is a form of light activated chemotherapy without heat generation. Its mechanism is based on vascular differential selectivity of the photosensitizer coupled with laser activation of the photosensitizer in achieving targeted and selective vascular destruction. The advantages of photochemotherapy over PDL include targeting different sized vessels at the same time, lesser risk of epidermal injury especially in pigmented skin, and enhanced safety via continuous low irradiance over several minutes to achieve effective dose effect. New agents such as benzoporphyrin with strong absorption spectrum in green, yellow and red light can be used to target different levels with eventual tailor made treatment according to thickness of PWS. The preliminary results are promising.

Learning points:
Photochemotherapy or photodynamic therapy (PDT) is a new advanced treatment for port wine stain with promising preliminary results.

B) Fillers and botulinum toxin

Advances in tissue fillers

Speaker: Dr. Brian Kinney
Clinical Assistant Professor of Plastic Surgery, University of Southern California School of Medicine, Los Angeles, USA

Tissue fillers are substances used in soft tissue augmentation to enhance or replace volume that is lost in any part of the skin or subcutaneous fat. Hyaluronic acid is a common type of non-permanent filler. Its turnover is around 3-4 days. The molecular weight of the hyaluronic acid, size of the particle and the density of the cross-linking can affect the existing state and duration of effect. The uncross-linked form is mainly in a liquid state that can last for only 4 days while the cross-linked form is in the form of a gel that can resist degradation, resulting in a more long lasting effect. The more cross-links the substances have, the more firmness there will be. Swelling depends on water content. The higher the water content is, the more the swelling there will be. Injection of hyaluronic acid can be used to soften the lines of the nasolabial fold. Complications are usually related to injection technique rather than the syringe used. Side effects include pain at the injection site, erythema and granuloma formation.

Learning points:
Hyaluronic acid is a common type of non-permanent filler used in soft tissue augmentation.

Advances in botulinum toxin treatment

Speaker: Dr. Mauricio de Maio
Consultant Plastic Surgeon, Department of Plastic Surgery, Faculty of Medicine, University of Sao Paulo, Brazil

Botulinum toxin is an effective method to improve wrinkles resulting from hyperdynamic lines caused by the repetitive movement of the underlying facial musculature. Good understanding of facial muscle anatomy, muscle force directional study and vectoral analysis are important. Botulinum toxin aims to block the excessive vector muscle contraction. For practical purposes in botulinum toxin injection, the facial anatomy can be divided into upper face, mid and lower face. For the treatment of the upper face, glabellar frown lines, horizontal forehead lines and crow's feet are common presentations in the aging face, which can be smoothened by botulinum toxin injection with rewarding results. However, treatment of the mid and lower face is more prone to complications. Injection into the levator labii superioris alaeque nasi may flatten and smoothen the upper third of the nasolabial fold. Care should be taken not to induce complication such as causing a disfigured smile. The best candidates are patients with a short upper lip and gummy smile. Injection into the orbicularis oris can smoothen the perioral wrinkles but may weaken the lip sphincter, which may further compromise lip function such as whistling, singing, drinking through a straw. It can be avoided by using low doses injected superficially into the transition line between the skin and mucosa. Blocking the depressor anguli oris may elevate the mouth corner, which may make the subject appearing younger. If the depressor labii inferioris is compromised, speech impairment and drooling should be watched for.

Learning points:
Botulinum toxin injection is an effective treatment to ameliorate facial wrinkles. Injection technique and patient selection are important factors for successful outcome.

Combination therapy with fillers and botulinum toxin

Speaker: Dr. Mauricio de Maio
Consultant Plastic Surgeon, Department of Plastic Surgery, Faculty of Medicine, University of Sao Paulo, Brazil

Combination therapy with fillers and botulinum toxin can have synergistic effect for cosmetic indication. The perioral muscles include elevators and depressors that are antagonists in achieving balance during animation. An unpleasant gummy smile may be resulted from an excessive contraction of the levator labii superioris alaeque nasi which could be improved by injecting botulinum toxin and fillers in the upper lip. A deep oral commissure presenting a "sad" appearance may be secondary to over contraction of the depressor anguli oris. It can be improved by blocking this muscle and filling the corner of the mouth. Deep nasolabial fold may be due to muscle over-contraction or lack of volume. By blocking the two medial elevators of the mouth (levator labii superioris aleque nasi and levator labii superioris), lateral elevators including the zygomaticus major and minor will achieve the effect of cheekbone lifting. The lack of volume can be improved by using filler. Drooping in the nose tip during smile can be managed by relaxing the depressor septi nasi and filling the nasolabial angle resulting in tip elevation and younger appearance. The combination therapy with fillers and botulinum toxin may require lesser amount of the products and can achieve a longer duration of therapeutic effect.

Learning points:
The combined effects of fillers and botulinum toxin can result in synergistic cosmetic effects in selected patients

Management of complication of fillers and botulinum toxin

Speaker: Dr. Zakia Rahman
Clinical instructor, Department of Dermatology, Stanford University, San Jose, USA

Botulinum toxin and fillers are widely used for aesthetic facial indications. Botulinum toxin acts by preventing the release of acetylcholine at the neuromuscular junction of striated muscle fibers, creating flaccid paralysis of the muscle. There are 7 serologically distinct types of botulinum toxin. Botulinum toxin A appears to be the most potent in humans. Clinically, muscle weakness is seen approximately 2-4 days following injection, with maximal effect completed at 7-10 days and last for 2-6 months. Botulinum toxin B is less potent than botulinum toxin A to achieve similar results in dynamic rhytides. It has been shown to be effective in patients who have antibodies to type A toxins. Adverse effects are usually mild and transient and are associated with poor injection technique or inappropriate patient selection. Transient adverse events include swelling, bruising at the injection site, mild headache and flu-like symptoms. The most serious complications in the treatment of the upper face are brow and eyelid ptosis and asymmetrical changes to the appearance of the eyebrows. Brow ptosis is the result of poor injection technique during glabellar or brow treatment and occurs when the injected toxin affects too much of the frontalis. Upper eyelid ptosis occurs when the toxin diffuses through the orbital septum, affecting the upper eyelid levator muscle which is most commonly seen following treatment of the glabellar complex. The most common side effects of fillers are injection site reactions, bleeding, bruising, infection, pigmentation and allergic reactions. The most serious complications include blindness, skin necrosis, anaphylaxis or respiratory arrest leading to death. Prevention and early recognition of complication and proper management are important.

Learning points:
Complication should be watched out for botulinum toxin and fillers injection. Adverse effects are usually mild and transient and are associated with poor injection technique or inappropriate patient selection.

C) Symposium on controversies

Stability of Liposuction

Speaker: Dr. Cheng-jen Chang
Director, Division of General Plastic Surgery, Department of Plastic Surgery, Chang Gung Memorial Hospital, Taipei, Taiwan

A variety of surgical and medical interventions have been used to remove subcutaneous fat including suction-, ultrasound-, power- and laser-assisted liposuction, low level laser-assisted lipo-sculpture, carbon dioxide injection and mesotherapy. Laser lipoplasty, also called interstitial laser lipolysis, uses a pulsed Nd YAG laser and is an effective, minimally invasive option widely used in many countries.

Learning points:
Laser lipolysis associated with liposuction is a new method for reduction of localized adiposity.

Iontophoresis versus skin whitening

Speaker: Professor Woraphong Manuskiatti
Associate Professor, Department of Dermatology, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Multiple treatment modalities including topical bleaching preparations, laser and light treatments have been applied to improve pigmentary disorders. Iontophoresis is a process of increasing the penetration of drugs into the skin by application of an electric current.

Its claim on being effective in treatment of pigmentary disorders such as melasma is still controversial.

Learning points:
Effectiveness of iontophoresis in treating skin pigmentation and skin whitening is still controversial.

D) Future direction of cosmetic dermatology and plastic surgery

Future direction for skin tightening

Speaker: Dr. Dieter Manstein
Instructor in Dermatology, Wellman Center for Photomedicine, Harvard Medical School, Boston, USA

The objective of deep tissue tightening procedures is to improve skin laxity and smoothen wrinkles. Various physical modalities are now available, these include infrared lasers, infrared lamps, radiofrequency devices and high intensity focused ultrasound devices. The role of immediate collagen shrinkage versus delayed contraction by wound healing is an important area for future research.

Learning points:
Various modalities are used to achieve skin tightening by providing a defined thermal injury within the dermis and thus stimulating remodeling of tissues through a wound healing process.

Future directions of smart devices

Speaker: Professor Stuart Nelson
Professor of Surgery and Biomedical Engineering, Beckman Laser Institute and Medical Clinic, University of California, Irvine, USA

Selection of laser parameters for patients have been more complicated with developments of user-specific parameters such as adjustable wavelengths, pulse duration, cryogen spurt duration and cooling times. There are also new, smart devices that utilize optical and thermal sensing to make "observation" of the patient's skin in order to provide feedback measurements for selection of the most appropriate parameters of the light treatment.

Learning points:
Optical and thermal sensing techniques can provide real-time quantitative imaging useful in light-based therapies in cosmetic dermatology.

Technology transfer: from invention to commercialization in dermatology

Speaker: Dr. Irina Erenburg
Associate Director, Research Ventures and Licensing Department, Strategic Transactions in the Partners Healthcare, Massachusetts General Hospital, Boston, USA

Aesthetic/cosmetic dermatology represents one of the few fields of medicine in which consumer (patient) demand and consumer (patient) satisfaction plays a critical role in determining the success of a product. There is rapid growth of this sector in the last several years which attracted many new clinical practitioners and investors into the market.

Learning points:
Commercialization of products in dermatology is a very challenging process, aspects such as intellectual property protection, commercialization planning, and corporate partnerships are crucial.

E) Facial contouring and rejuvenation

Fractionated bipolar radiofrequency facial rejuvenation

Speaker: Dr. George Hruza
Clinical Associate Professor, Department of Dermatology and Otolaryngology, St Louis University School of Medicine, Missouri, USA

The Matrix RF™ (Syneron Medical Limited, Israel) device delivers fractionated bipolar radiofrequency currents to the skin for skin rejuvenation. Twenty-two Fitzpactrick skin type I-IV adults with visible wrinkles and elastosis were treated with three Matrix RF™ treatments to two facial areas with rhytids under topical anesthesia. Treatments were spaced one month apart and follow up one month after last treatment. Deep wrinkle was treated with 64 pin tips electrode with higher energy and fine wrinkle was treated with 144 pin tips with lower energy. The results were assessed by a dermatologist using standardized digital photos on a percentile of improvement scale.

Several patients underwent skin biopsy to evaluate histologic changes resulted from treatment. A depth of 300 µgm coagulation was noted in the dermis. Twenty-four hours after treatment a grid of 0.5 mm superficial eschars appeared that were sloughed off within 24 to 48 hours, the downtime was minimal and the pain related to treatment was mild to moderate. There was no pigmentary change and scarring. There was good wrinkle reduction especially in periorbital and cheek area. There was significant improvement in rhytids, skin smoothness and luster. Skin tightness was improved.

Learning points:
Fractionated bipolar radiofrequency was shown to be an effective option for skin rejuvenation of all skin types in this study involving 22 subjects.

Skin rejuvenation and facial contouring - options and combinations

Speaker: Dr. Nancy Garcia-Tan
Consultant, Department of Dermatology, University of the East-Ramon Magsaysay Memorial Medical Center, Manila, Philippines

Various treatment modalities are used for skin rejuvenation. The treatments can be divided into non-ablative, partial ablative and ablative modalities. The ablative procedures have significant benefit for aging and damaged skin but can result in significant adverse effects. In addition to prolonged downtime, a significant portion of Asian patients may develop postinflammatory hyperpigmentation. The non-ablative rejuvenation modalities have fewer adverse effects but have variable outcomes. Moreover, repeated treatments may be necessary and therefore cost effectiveness is an important issue for consideration. The use of radiofrequency devices for skin tightening in combination with botulinum toxin and filler injection is an effective and safe treatment combination for facial skin rejuvenation.

Learning points:
Combination of light or energy devices with botulinum toxin and filler injection can achieve safe and efficient results in facial rejuvenation.

Rhinoplasty in Asian nose

Speaker: Dr. Cheng-jen Chang
Director, Division of General Plastic Surgery, Department of Plastic Surgery, Chang Gung Memorial Hospital, Taipei, Taiwan

East Asian nose is characterised by its smaller size in proportion to the face and flattened nasal bridge. The use of silicone nasal implants can cause haematoma, capsule formation and even

tissue necrosis. Classical augmentation rhinoplasty techniques can be applied to East Asians. The features of ideal nose should be understood such as well defined lobule, oblique anteroposterior orientation of nares, tip of nose in the most anterior point in face with accentuated slight supradip depression, approximate the shape of an equilateral triangle. Other features such as dorsal projection of nose, nasolabial angle, shape and orientation of nares and columella should be noted.

Learning points:
Based on the understanding of ideal features of the nose and characteristics of East Asian nose anatomy, augmentation or reduction rhinoplasty can be applied to treat individual patient needs.

Fifteen years of CO_2 laser blepharoplasty

Speaker: Professor Luiz Toledo
Professor in Plastic Surgery, Department of Plastic Surgery, International Modern Hospital, Dubai, United Arab Emirates

In performing blepharoplasty, the initial assessment of the lower eyelid for skin excess will guide the approach for subsequent procedures. If elasticity of skin is preserved, transconjunctival incision to remove fat without skin removal is used. If there is loss of elasticity of the lower eyelid, a combination of skin and fat removal is employed. Light pressure will express the fat from lower eyelid after incision, which is then removed with laser. The need for fat injection to periorbital area, orbit margin, eyelid, and nasojugal fold will also be assessed at the same time.

Learning points:
Carbon dioxide laser had been used in conjunction with surgery for blepharoplasty with good results. The use of fat injection in the periorbital area will decrease the diameter of the orbit to produce a younger look.

F) Fat and cellulite

Treatment of fat and cellulite

Speaker: Dr. Henry Chan
Honorary Clinical Associate Professor, Division of Dermatology, Department of Medicine, The University of Hong Kong, Hong Kong SAR

Various methods have been employed to treat unwanted localized fat with variable efficacy.

Adipose tissue is destroyed with increase in temperature to a certain level. Laser and other light sources have been used to treat fat tissue by selective photothermolysis of fatty tissue. Only superficial fat tissue can be reached by these modalities and cooling is essential. Radiofrequency devices will remove localized fat through thermal injury. There would be considerable pain in area treated.

Focused ultrasound uses thermal and acoustic effects to treat localized fat. It can cause local thermal injury to fat within seconds. The tissue temperature outside the focused point is low and thus preventing damage to surrounding tissue. However, good results may not be reproduced in Asian as in Caucasian people. It was proposed that this is probably because of smaller body sizes, relative to the probe, in Asians compared with Caucasians.

Learning points:
Focused ultrasound for fat removal is based on local thermal and acoustic effects to fat tissue. Its application in Asian people however needs further researches.

Advances in non-invasive fat removal

Speaker: Dr. Dieter Manstein
Instructor in Dermatology, Wellman Center for Photomedicine, Harvard Medical School, Boston, USA

There is a demand for non-invasive fat removal because of significant morbidity of invasive procedures. Various modalities of treatment

including radiofrequency, ultrasound, infrared laser at bands absorbed by fat were employed for selective fat damage to subcutaneous fatty tissue.

Selective cryolysis of fat was based on the observation that adipose tissue was susceptible to damage induced by controlled cold treatment. Cryolipolysis™ (Zeltiq Aesthetics) is the use of controlled low temperature for selective fat damage. This was proven to be successful in pig model. The procedure caused a biological response in damaged adipose tissue resulting in fat removal.

Conventional cryotherapy using liquid nitrogen will cause a necrotic destruction and non-selective destruction of skin tissue. Cryolipolysis™ (Zeltiq Aesthetics) makes use of higher temperature and controlled freezing with a sensor device. The treatment time was also prolonged in more than ten minutes. The Zeltiq™ (Zeltiq Aesthetics) device employed a temperature of -7°C for cryolysis of adipose tissue. At this temperature with application for ten minutes, there was no destruction of epidermis and dermis. With decreasing temperature, the inflammatory response will be increased and the level of fat damage will increase. Further understanding of the mechanism and development of Cryolipolysis™ (Zeltiq Aesthetics) for clinical use is pending.

Learning points:
Selective cryolysis of adipose tissue is a new modality for fat removal.

The effect of transplanted fat on surrounding tissue and structural fat grafting to face and neck

Speaker: Dr. Sydney Coleman
Clinical Assistant Professor, Department of Plastic Surgery, NYU Medical Center, New York, USA

It was found that human adipose has the highest concentration of stem cells. There were reports that patients with fat grafting was found to have continuous improvement of skin condition including texture, color and scar for more than eight years despite additional effect of aging.

Fat grafting does not just cause recontouring and remodeling of skin but also has the observed effect of repairing damaged skin. There was report that fat grafting to radiation damaged area resulted in healing of ulcers. It can also transform damaged skin to more normal skin that enable prosthesis fitting. It was proposed that several components in fat tissue may be responsible for the repairing effect, such as growth factors, cytokines and adipose-derived stem cells. Adipose derived stem cells have also been hypothesized to be useful for creation of other new tissues such as bone, muscle, cartilage, blood vessel and skin. Further research is warranted in this area. However fat grafting is associated with complications, the most serious is fat embolism.

Facial aging is signified by the loss of volume, and atrophy plays a significant role in facial aging process. Laxity of soft tissue presenting as sagging and descent is a secondary event. Restoring the fullness of atrophic aging facial skin is essential for rejuvenation and modification of facial contour. Adding fullness to various anatomic locations in face with fat grafting is a natural approach to rejuvenation. Areas such as temples, eyebrow, upper and lower eyelids, glabella, nose, nasolabial fold, lips, jaw line and neck are treated according to different patient profiles. Examples are selective radial expansion of infraorbital area for laxity of lower eyelids, intradermal placement of fat graft in nasolabial fold to improve contour and for rejuvenation.

Learning points:
Fat grafting is a promising for skin remodeling and rejuvenation. Fat grafting may have additional effect to repair damaged skin. Fat embolism is the most important adverse effect and can have serious consequences.