

Reports on Scientific Meetings

Joint workshop on lipolysis and treatment of vascular lesions

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Organisers: The Hong Kong Society of Dermatology and Venereology; The Hong Kong Association of Specialists in Dermatology; Hong Kong Society of Plastic, Reconstructive and Aesthetic Surgeons

Non-invasive fat removal

Speaker: Prof. Henry HL Chan
Honorary professor, Division of Dermatology, Department of Medicine, The University of Hong Kong, Hong Kong

Apart from standard surgical liposuction, fat removal can be done non-invasively. It involves the use of radiofrequency, ultrasound, laser or cryotherapy technique to break down fat cells, which will then be reabsorbed by the body, while leaving the skin intact. It does not require anaesthesia. Furthermore, it saves patients from post-operative pain and surgical scars. However, usually multiple treatment sessions are required and it is useful only in removing small volume or localized pocket of fat. Moreover, patients need regular exercise and proper diet in order to retain the result.

Ultrashape® employs localized ultrasound waves to break down fat cells. It is a painless, non-invasive procedure. However, it requires long operative time and the ultrasound waves cannot penetrate deep into the subcutaneous tissue. Local experience shows that it is more effective in younger patients, probably related to their

higher metabolic rate. However, it is not as effective to Asians when compared to the Caucasians; one reason may be related to the relatively large probe size compare to the smaller built of Asian patients.

Liposonix® utilizes high-density ultrasound waves to induce thermal effect, which break and melt fat cells. It can penetrate deep into the subcutaneous layer without causing damage to the skin surface. However, patients may experience pain and discomfort during the procedure and there may be associated bruises.

Cryolipolysis produces cooling effect by heat extraction technique, which targets at fat cells, and induces apoptotic cell damage to fat cells. It is effective for the removal of localized fat pocket. Pain and bruising are the common side effects.

Learning points:

External ultrasound or cryotherapy provides non-invasive alternative for fat removal. However, they are effective only in localized fat removal and further studies are required to confirm their efficacy.

The reconstructive role of fat graft

Speaker: Dr. George Li
Consultant, Department of Surgery, Queen Mary Hospital, Hong Kong

Fat transfer is the technique of harvesting fat from one part of the body, where excess exists, and transfer to another site, where fat is deficient. This is not only used for purely

aesthetic purposes, but is also used for restoration of defect secondary to a variety of connective tissue diseases, congenital defects or iatrogenic defects after operation.

The fat transfer process includes harvesting of fat from the donor site using large-bore needle or liposuction cannula under local anaesthesia. The fat emulsion is then centrifuged, excessive fluid or blood removed and re-injected to the recipient site.

It has been used in a variety of diseases like post-craniotomy, lupus panniculitis, Perry-Romberg syndrome, enophthalmos, ectropion, burn scar and breast augmentation with promising results.

Advantage of autologous fat transfer is that it is free from rejection. Fat graft is more than just a filler. It contains not only fat cells, but also stem cells and various growth factors. Hence, it not only restores the contour, but also the texture and elasticity of tissue. Moreover, fat transfer can be done under local anaesthesia and save patients from major reconstructive operation. Complications include bruising and skin necrosis over the donor site and transient nerve palsy due to liposuction procedures. Graft survival is also highly variable, which ranges from 10-80%, depending on the surgical and injection technique. Smoking has major detrimental effect on graft survival. Reabsorption of fat graft makes multiple treatment sessions necessary.

Learning points:

Autologous fat grafting is a promising way of restoring defect in contour and texture in a minimally-invasive manner. Smoking should be avoided to enhance graft survival.

Liposuction – an overview

Speaker: Dr. Lung-kwan Ng
Plastic surgeon, private practice, Hong Kong

Liposuction, also known as lipoplasty, is the surgical removal of fat. However, it is not an

alternative to dieting and exercise in weight reduction.

There are various treatment modalities for liposuction: suction-assisted lipoplasty (SAL), internal ultrasound-assisted lipoplasty (IUAL), power-assisted lipoplasty (PAL), external ultrasound-assisted lipoplasty (EUAL) and laser-assisted lipoplasty (LAL).

Wet liposuction is the most commonly used technique. Klein solution, which contains epinephrine to constrict blood vessels, lignocaine as a local anaesthetic, sodium bicarbonate and normal saline, is injected into the subcutaneous layer. This fluid creates room between fatty tissue, muscle and neurovascular bundles for cannulation. Despite a potentially large volume of lignocaine is injected into the tissue, most of the solution is sucked out eventually and systemic side effects of lignocaine is rare.

SAL is the most traditional way of liposuction. Small incisions just larger than the cannula size are made around the joint or skin folds. The surgeon will push and pull the cannula along the subcutaneous layer to break the fat cells and draw them out. However, this method requires a lot of manipulations and is difficult for a large area of fat removal. IUAL utilizes specialized cannula which transmits ultrasound vibrations into subcutaneous layer. The vibrations will break down and emulsify the fat cells, making it easier to be sucked out. It is good for large volume of fat removal and over fibrous area like the back. However, it requires long operation time, and is associated with seroma formation, skin necrosis and peripheral nerve injury. Third generation ultrasound machine, VASER® Lipo system, uses pulsed energy delivery system and a specialized probe. This reduces the energy delivered and hence decreases the risk of thermal injury. PAL uses specialized cannula which makes reciprocating motion to break up the fat instead of manual movement by surgeons. Hence, it is more efficient in handling large volume of fat removal with less neurovascular bundle damage or seroma formation. However, it is a quite noisy procedure.

EUAL makes use of external ultrasound probe on skin surface without cannulation. It is free from surgical incision, injection of fluid, pain and post-operative seroma or haematoma. However, it depends on self reabsorption of the fat emulsion and its efficacy still remains controversial. LAL makes use of thermal energy from laser to break the fat cells and coagulate blood vessels at the same time. Laser of the 1440 nm wavelength has the highest efficacy for fat tissue.

Learning points:

For small volume of liposuction, non-invasive EUAL is recommended. While for medium volume, LAL 1440 nm is preferred. However, PAL, IUAL or VASER® Lipo system are more suitable for large volume of fat removal.

Power assisted – liposuction

Speaker: Dr. Ming-shiaw Cheng
Plastic surgeon, private practice, Hong Kong

Ultrasound-assisted liposuction utilizes high-pitch ultrasound waves to liquefy fat cells before they are removed. It is easier to manipulate and causes less neurovascular damage than the traditional suction-assisted liposuction. However, older generation ultrasonic liposuction technique was associated with higher risk of burns, blistering, scarring and seroma due to the high thermal energy created.

Third generation ultrasonic liposuction technique, VASER® Lipo system, produces a more efficient, precise sculpturing of body with less adverse effect. VASER® Lipo system uses smaller grooved probes, which allow higher frequency delivered at a precise target. Hence, it is more tissue specific and induces less collateral damage. Moreover, vibration waves can be delivered in a pulsed manner. It greatly reduces the amount of energy and hence reduces the thermal damage.

VASER® Lipo system can remove large volume of fat safely and efficiently. Also it is good for

more fibrotic area like the back. There is also less damage to the vessels resulting in less blood loss and bruising. Complications include infection, bruising or burn at entry sites, seroma, residual skin laxity, contour irregularity and deep vein thrombosis. Early ambulation, compression garment and antibiotics prophylaxis can help to reduce these complications.

Learning points:

With the advance in technology of ultrasound-assisted liposuction, large amount of fat can be removed safely and efficiently. However, dieting and exercise are still essential elements for weight reduction.

Medical treatment of vascular lesions

Speaker: Prof. Godfrey CF Chan
Professor, Department of Paediatrics & Adolescent Medicine, The University of Hong Kong, Hong Kong

Infantile haemangioma is the most common tumour in infancy and it is more prevalent in Caucasian, female, fair skin and premature infant with <1.5 kg birth weight. Infantile haemangiomas are benign vascular neoplasms that have three clinical phases including the proliferation, stabilization and regressing phases. During the proliferative phase in the neonatal period or in early infancy, endothelial cell proliferation is responsible for the enlargement of infantile haemangiomas. Finally, evolution occurs and most infantile haemangiomas are clinically resolved by the year of nine.

Eighty percent of infantile haemangiomas are solitary. Sixty percent of cutaneous haemangiomas occur in the head and neck region, 25% on the trunk, and 15% on the extremities. Haemangiomas can also occur in extracutaneous sites, including the liver, gastrointestinal tract, larynx, central nervous system, thymus, spleen, pancreas, gall bladder, lymph nodes, lung, urinary bladder, and adrenal glands.

On physical examination, when there are more than three clinical lesions, we need to look for any visceral involvement by abdominal ultrasound. Moreover, one should look out for hypothyroidism by checking thyroid function test, performing magnetic resonance imaging of the spine to rule out spinal dysraphism and measuring platelet count to screen for Kasabach-Meritt syndrome.

The vast majority of infantile haemangiomas do not require any medical or surgical interventions. Absolute indications for treatment include airway and eye involvement, auditory canal obstruction, high output heart failure (especially when large haemangioma is present in the liver), and decreased platelet count. Relative indications for intervention include facial involvement, bleeding, ulcer and pain.

There are numerous medical treatment options for infantile haemangioma. Steroid is only effective in the proliferating phase. And its mechanisms of action include vasoconstriction, inhibition of angiogenesis and a decrease in mast cell production. Steroid can be given intralesionally and orally with a suggested dose of 0.5-5 mg/kg/day. Propranolol has vasoconstrictive effects and it inhibits angiogenesis. Side effects include hypoglycemia, bradycardia and decrease blood pressure. It can be given at 2 mg/kg/day in four divided dose. Interferon- α is indicated in life – threatening condition. However, up to 20% of patients receiving interferon- α may develop irreversible spastic diplegia. Vincristine can be given in life threatening condition or in case of massive growth, but close monitoring of neurological side effects is needed.

Learning points:

Infantile haemangioma is the most common tumour in infancy and there are numerous treatment options available. Propranolol is increasingly popular as the first line treatment and we need to be aware of its side effects like hypoglycaemia, bradycardia and hypotension.

Surgical treatment of vascular lesions

Speaker: Prof. Andrew Burd

Professor, Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, The Chinese University of Hong Kong, Hong Kong

As practicing doctors, we need to have careful history and physical examination to differentiate amongst different types of vascular lesions.

Most haemangiomas do not require treatment. Indications for early intervention are primarily functional, such as obstruction of vision or airway. Uncontrolled bleeding and pain caused by an ulcerated haemangioma may also be an indication for intervention. Facial haemangiomas, especially aggressive, rapidly spreading haemangiomas, may necessitate early pharmacologic or surgical intervention to decrease the long-term aesthetic deformity. Very large haemangiomas may be associated with platelet trapping, thus requiring early intervention. Parental concerns and psychosocial effects of the deformity on the growing child should also be taken into consideration on deciding whether early treatment would be given or not.

Unlike haemangioma, capillary malformations do not undergo spontaneous involution and it enlarges with the child's growth.

Learning points:

Detailed history and physical examination are needed to distinguish amongst different types of vascular lesions. Also, aesthetic and psychological aspects of patients and relatives need to be considered in patient's management.

Laser treatment of vascular lesions in Asia

Speaker: Prof. Henry HL Chan

Honorary professor, Division of Dermatology, Department of Medicine, The University of Hong Kong, Hong Kong

Asian patients, having more melanin in the epidermis, are at higher risk for side effects like

pigmentary change and vesiculation after laser therapy of vascular lesion. Moreover, higher fluences may be needed to achieve desirable clinical effects as the epidermal melanin acts as a competing target chromophore for haemoglobin.

Epidermal cooling has been proposed to reduce side effects and improve the clinical outcome of vascular lasers. Contact cooling can decrease the chance of epidermal damage, but texture change can still occur after treatment.

Studies have compared the use of pulse dye laser alone to pulse dye laser with cryogen spray cooling for the treatment of port-wine stain among Asian patients. They found that pulse dye laser with cryogen spray cooling enhanced clinical efficacy and a higher fluence could be used without an increase in complications, such as permanent scarring or dyspigmentation. Therefore pulsed dye laser equipped with an epidermal cooling device is considered to be the optimal laser treatment for port wine stain in Asian.

Intense pulsed light (IPL) can also be an effective treatment option for port wine stain. As IPL has a fixed spectrum of wavelength and a wider range of pulse duration and fluence, it is able to target blood vessels of different depths and widths. The main disadvantage is the lack of adequate skin cooling which can lead to a higher risk of complications in dark-skinned patients if not use appropriately.

Learning points:

Asian patients who have more melanin in epidermis tend to have more pigmentary change after laser therapy. Both pulse dye laser with epidermal cooling and intense pulsed light are effective treatment modalities for port wine stain.

The contemporary management of vascular malformation-interventional radiologist's perspective

Speaker: Dr. Wai-lun Poon

Consultant, Department of Diagnostic Radiology, Tuen Mun Hospital, Hong Kong

Vascular anomalies are grouped into 2 categories: haemangiomas and vascular malformations. Vascular malformations are categorized further as high-flow lesions (arteriovenous malformations, arteriovenous fistulae), low-flow lesions (capillary malformations, venous malformations, lymphatic malformation) or combined vascular malformations.

Embolization refers to the introduction of various substances into the circulation to occlude vessels, either to reduce blood flow to an arteriovenous malformation or to stop or prevent haemorrhage from vascular lesion. Materials available for embolization include absolute alcohol and ethanolamine oleate.

Ethanol (absolute alcohol) is the most commonly used liquid agent. Embolization with absolute alcohol has a direct toxic effect on the endothelium that activates the coagulation system and causes the micro aggregation of red blood cells. Response rate by using alcohol is high but the procedure itself can have some painful sensation. Moreover, if large amounts of absolute alcohol enter the systemic circulation, toxic effects can occur. These include central nervous system depression, haemolysis, pulmonary hypertension and even cardiac arrest.

Learning points:

Embolization is a common method to arrest haemorrhage from vascular lesion or to reduce blood flow in arteriovenous malformations. Absolute alcohol and ethanolamine oleate can be considered for use in embolization.