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Editorial

Should dermatologists perform more dermatologic surgery?

The clinical practice of dermatology has changed during the past 25 years. Dermatologists are performing more skin surgeries than before[1]. When I was a medical student attending the skin clinic in University Hospital, we saw mainly patients with medical dermatology problems. Today, if one visits a modern dermatology centre, one would be able to see an array of dermatologic procedures. It is not surprising since dermatologists have been pioneers in dermatologic surgery for many years. They have not only created Mohs micrographic surgery but have developed and enhanced many new technologies including cryosurgery, botulinum toxin injection, laser surgery, soft tissue augmentation, tumescent liposuction, hair transplant and reconstructive surgery for skin cancers. Over the last 25 years, new technologies have change dramatically the way dermatologists practice. They use laser to treat nevus of Ota and tattoos, botulinum toxin injection to improve wrinkles and fractional resurfacing laser to treat acne scars. They also use intense pulsed light (IPL) to rejuvenate the face, radio frequency devices to tighten skin, hyaluronic acid injection to replace volume loss in the photoaging skin and many others not to mention microdermabrasion, chemical peels, hyfrecating seborrheic keratosis and applying topical acids to treat xanthelasma.

In fact dermatologists perform more surgical procedures on the skin than any other specialty based on data from the Centre for Medicare and Mediaid services in United States[2]. Mohs micrographic surgery remains the 'gold standard" as a technique that has the highest cure rate for the treatment of most skin cancers. They result in smaller scars for defects that are important in functional and cosmetic areas of the face. These data are interesting because they show that the incidence of skin cancers are probably increasing. Reported incident rates vary, but in the United States the combined incidence for basal cell carcinoma, squamous cell carcinoma, and melanoma is reported to be about 1 million new cases in 2007.

Dermatology is broadly recognized as a comprehensive organ based specialty and this include training in the fundamental understanding of the structure, function and pathophysiology of the skin. Despite the increase in skin surgeries, training program in the country has not evolved at the same rate. In fact, dermatopathology is generally given more emphasis for differential diagnosis and regarded as more important than skin surgery during training and differential diagnosis is usually regarded as the heart and core of dermatologic training. Dermatologic surgery topics are usually relegated to the last chapter of any multivolume text of dermatology

However, for better or for worse, dermatology is now a medical and surgical field[3]. The issue is not whether dermatologists perform such procedures but whether they continue to train, educate and research in the surgical aspects of dermatology. As such, it is important that training and research in dermatologic surgery should play an important role in the academic program of dermatology. All dermatology trainees must become competent to perform basic dermatologic surgery upon graduation from their training. Good surgical skills must be taught early in their training to ensure that, in the absence of adequate guidance, they do not habituate to poor technique which is subsequently difficult to alter. Patients may be better served by a dermatologist with surgical skills who is able to provide all their dermatologic care, thus eliminating the need for frequent referrals to a surgeon. Finally, if excellent surgical training were the norm in dermatology education, patients would regard their dermatologists as the expert in skin cancers and skin surgeries. There is no doubt that the true experts in any field of medicine are those that do the same procedure over and over again. High-risk surgeries are better done by surgeons who do lots of them[4].

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Review

Skin rejuvenation procedures - An update

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Introduction

Skin aging, presenting with rhytides/sagging and photodamage, and scarring from severe acne, surgery, or trauma are cosmetic disfigurements which may cause psychologic damage and prompt patients to seek advice about treatment. Solar damage of the skin leads to epidermal abnormalities, such as lentigenes and actinic keratoses, and the degeneration of collagen, which results in the formation of rhytides and telangiectasias. A variety of different treatments have been used for the rejuvenation of sun-damaged skin, including topical retinoids, bleaching agents, chemical peeling, dermabrasion, lasers and light devices. The optimum resurfacing laser provides precise skin vaporization with minimal postoperative morbidity, which depends significantly on the depth of ablation and energy fluence.

The ablative lasers era:

In the early 1980s, the CO_2 laser was the most commonly used ablative laser in dermatology practice. It was initially used for the treatment of benign tumours, and soon gained popularity as a resurfacing technique for correcting photodamaged skin including wrinkles, dyspigmentation and scars[1]. Ablative lasers including the CO_2 laser and Er:YAG lasers resurfacing remains the most effective treatment for photodamage and intrinsic wrinkling, acne scars, chickenpox scars and traumatic scars to date. It has been used for many years since the introduction of scanners that allow resurfacing of large skin areas. These traditional ablative laser resurfacing procedures offer reliable and predictable positive outcome[2]. Unfortunately, CO_2 ablative lasers are associated with unacceptable morbidity and complications e.g. severe pain, prolong erythema, postinflammatory hyperpigmentation (especially in Asians), late onset hypopigmentation and scarring. Transient erythema is the result of the natural healing process of the resurfaced skin. On the other hand, persistent erythema is a troublesome complication to the patient and laser surgeon, as the patient wishes to return to normal activities in the shortest possible time. HSV Infections is a dreaded complication as it may cause severe scarring. Downtime is long and patient requires long leave to recover from the ablative laser procedures. Another major disadvantage of ablative laser resurfacing is the need of local or general anaesthesia. As a result, over the last few years, ablative laser became less popular among patients[3,4].

The pulsed Er:YAG laser with the unique feature of maximal water absorption (water absorption coefficient 16 times greater than the CO_2 laser), and therefore minimal optical penetration depth and thermal damage, has been shown to be efficacious in the treatment of mild to moderate superficial rhytides and scars[2]. This infrared spectrum (2940=nm), has been shown to provide very precise ablation, because of its high selectivity to tissue water and negligible thermal damage. The characteristics of a wavelength with maximal water absorption, a sufficiently short time duration (< 1 ms), and sufficient energy fluence place the Er:YAG laser as the optimum ablative device for fine and superficial resurfacing of the skin. Pinpoint bleeding appears after several passes (4-5 passes depending on the spot size and energy fluence) with exposure of the dermo-epidermal junction, and the laser treatment is usually stopped. Therefore, bleeding is a problem in the treatment of deeper wrinkles with the Er:YAG laser[5]. The main advantages of the Er:YAG over the CO_2 laser are the reduced thermal damage, shorter recovery time, less postoperative erythema, and fewer anesthesia requirements. The absence of thermal damage using the Er:YAG laser means less profound clinical and histologic improvement in photodamaged skin. In a bilateral comparison study of 20 patients using the CO_2 and Er:YAG lasers in the treatment of facial rhytides, there were no significant differences in postoperative erythema, pain, and healing time when equal depths of tissue coagulation and ablation were achieved with each type of laser[6]. However, the same study showed that, Er:YAG ablation is associated with less efficacy. Fine lines responded very well to this laser, whereas deeper rhytides showed a greater response to CO_2 laser resurfacing. Another study on 21 subjects with facial rhytides showed relatively better wrinkle improvement with the CO_2 laser, but quicker recovery with the Er:YAG laser[7].

The nonablative lasers era:

In 1983, Anderson and Parrish introduced the theory of selective photothermolysis[8]. It was realize that specific lasers wavelength can be harnessed to cause selective destruction of unwanted chromophores in cutaneous lesions.

This theory paved the way for the development and application of various laser systems that aim at destroying clinical lesions with minimal injury to the surrounding and overlying skin structures. Newer lasers were developed to achieve tissue remodelling by modifying collagen and connective tissue properties in the dermis while preserving the integrity of the epidermis. Nonablative procedures became fashionable and promoted in the early 2000s. These devices were touted to be able to stimulate nonablative collagen remodeling and promoted to be used for skin rejuvenation to treat wrinkles and scars (acne scars and traumatic scars)[9,10]. Numerous laser devices are developed for this purpose. Nonablative lasers use laser energy to stimulate collagen synthesis in the dermis without damaging the epidermis. Various light wavelengths have been harnessed in nonablative lasers. These lasers have long pulse width to generate continuous spread of heat through reflection, refraction and scattering in the dermis. The prerequisites are epidermal cooling and wavelengths sufficiently long to penetrate and injure the dermis. Laser heat in the dermis stimulates collagen remodelling and correct scars and wrinkles. These nonablative lasers treatment cause minimal downtime and patients are able to return to work the next day. The disadvantages of the procedure include uncertain treatment outcome, slow response, multiple treatments needed at monthly intervals, risk of postinflammatory hyperpigmentation (especially in Asians) and even blistering eruptions. Nonablative resurfacing works rather slowly that the patient may not notice much improvements if at all. Because it produces minimal improvement for skin rejuvenation, its use declined over the years.

The Vascular Lasers:

A possible role for PDLs in the treatment of photoaged skin had long been suggested by the apparent clinical and histologic collagen changes induced in PDL-treated hypertrophic scars, striae distensae, and acne scars[11-13]. The first to be utilized for wrinkle reduction was the 585-nm PDL (N-lite) at 350-microsecond and subpurpuric fluences. A clinical study using single PDL treatments (585-nm, 450-microsecond) demonstrated a clinical improvement in 75% to 90% of mild to moderate wrinkles and 40% in moderate to severe rhytides[14]. Histologic examination of the treated areas showed an increased amount of normal staining in elastin and collagen fibers in the papillary dermis, with increased cellularity and mucin deposition. Although another initial study demonstrated significant reduction in rhytides, further studies were unable to reproduce these findings and demonstrated only minimal effects[15]. Generally, only modest results have been observed with these short wavelengths, presumably because of predominantly vascular targeting and superficial penetration to the papillary dermis.

The Intense pulsed light (IPL)

Unlike the laser that emits a single wavelength of light energy that targets a specific chromophore, IPL devices harness a broad spectrum of light wavelength to target a wide range of chromophores on the skin. The IPL source is a flashlamp that emits wavelengths of non-coherent light in a spectrum from 500 to 1100 nm. Filters are used to block emission below a selection of threshold wavelengths that may cause damage to the epidermis. Because of its shorter wavelengths and broad spectrum of light, it is used mainly for treating Type 1 photoageing (i.e. superficial pigmentary disorders such as lentigenes, solar lentigo and freckles, and superficial telangiectasia). It is not very effective against wrinkles and not effective against acne scars. It is useful for light assisted hair removal in fair skin individuals. IPL should be used with caution in dark skin individuals e.g. skin type V-VI as the epidermal melanin absorb a substantial amount of the light energy to cause burn and blisters.

There are numerous reports on the efficacy of IPL in skin rejuvenation recently. One study reported 38% of patients noticed a 75% or better improvement of telangiectasias but only 18% of the patients experienced a 75% or better improvement in the fine wrinkles. 59% had improvement in erythema, 60% improvement in flushing, 67% improvement in pores by 50%; 70% improvement in telangiectasia; 72% improvement in skin texture smoothness; 75% overall improvement and in one patient with histological examination showed new collagen deposition. 61% stated the improvements to be very satisfactory[16]. In a report from Asia, 97 Asians patients that was treated with an IPL device followed up for 1 month after last treatment reported >90% improvement in pigmentation; >83% improvement in telangiectasia and >65% improvement in skin texture[17].

Our experience with the IPL of 139 patients treated for melasma at 4 weekly interval for 6 treatments in skin type 4-5 gave an overall fair reduction in pigmentation of 34%. However the reduction in pigmentation is short-lived and tends to recur within 3-6 months. Hence it is important to get patients to continue on maintenance sunscreen, sun avoidance and topical bleaching creams during and after IPL treatment.

Newer Skin Rejuvenation Procedures:

Newer devices recently developed for skin rejuvenation aims at improve its efficacy and associated with little downtime. The following devices were recently introduced. Preliminary results have shown them to be better than the traditional non-ablative lasers for treating wrinkles and scars but still less efficacious than the ablative lasers. It has less downtime compared to the ablative lasers but slightly more downtime compared to the non-ablative lasers.

1. Fractional Phothermolysis:
(a) Non-Ablative Fractional Lasers:

The newest technology to enter the laser arena is fractional resurfacing or fractional photothermolysis[18]. The concept behind this approach is to thermally alter a fraction of the skin, leaving intervening areas of normal skin untouched, which rapidly repopulate the ablated columns of tissue. The 1550-nm erbium-doped mid-infrared fiber laser induces cylindrical areas of thermal damage to the epidermis and upper dermis spaced at 2000 microscopic treatment zones of photothermolysis per cm^2.

Fractional photothermolysis is a relatively new and gradual laser procedure to rejuvenate the aging skin. This laser treatment causes multiple laser-puncture holes, which have been termed "microthermal treatment zones" (MTZ) of thermal injury, to the skin. Each MTZ has a diameter of 30-70 microns and depth of about 400-700 microns. These zones comprise approximately 15% to 25% of the skin surface area per treatment session. These small laser-puncture holes appear as faint tiny spots on the skin after the laser treatment. Because there is lots of normal skin in between the puncture holes, the cells from the normal skin rapidly repairs the holes and the skin heals rapidly. And as a result of this healing process, new collagen is formed and improvements in wrinkle scar and pigmented spots are seen. Compared to ablative resurfacing, fractional resurfacing results in faster recovery and fewer side effects. Erythema and edema resolve within a few days in most patients but the improvement in rhytides and photodamage is not as impressive as with ablative resurfacing. Mild to moderate improvement is observed, requiring multiple treatment sessions, totaling 5 to 6 and spaced at 1- to 4-week intervals. Sun-induced pigmentary alteration improves more quickly, while wrinkles require more treatments to result in a significant improvement.

Following the introduction of the Fraxel fractional lasers, several new nonablative fractional photothermolysis laser devices were introduced. The Lux IR (Palomar Medical Technologies) Fractional infrared handpiece attachment for the StarLux pulsed light and laser system technology delivers an array of small beams that create a periodic lattice of isolated hyperthermic columns ranging from 1.5 to 3.0 mm in diameter to the reticular dermis. The Lux 2940 fractional laser handpiece has been added, using delivery of erbium laser light to deliver very deep ablative columns. Another nonablative fractional resurfacing device is the Affirm laser (Cynosure Inc), which sequentially emits 1320-nm and 1440-nmwavelengths at fixed intervals. A microlens array is employed to diffuse the laser light into a lattice of microbeams,with targeting of superficial and deeper penetration depths through the two wavelengths. Matisse (Quanta System) is another nonablative fractional skin resurfacing laser using the Er:Glass 1540 nm wavelength. The 1540 nm laser wavelength is absorbed by the water of skin tissue by means of its lens array, stimulating the deep, the superficial dermis and epidermis at different temperature grades. It produces an evenly low level of thermal neocollagen and elastin stimulation on all the treatment areas and in addition, a high level thermal heating and coagulation within the fractional areas.

(b) Ablative Fractional Lasers

To induce more thermal injury with the hope it enhancing neocollagengenesis and improve the efficacy of the fractional lasers for skin rejuvenation, ablative fractional lasers were introduced recently. These lasers include those using CO2 laser system e.g. Mixto SX(Lasering USA), Encore(Lumenis) and the Fraxel Re:pair(Reliant Technologies) and those using the Er:YAG lasers system e.g. Pixel Alma Laser (Nexgen Lasers Inc) and Profactional laser system(Sciton Inc). The efficacy and side effects of these lasers remains to be seen.

The Fractional Resurfacing Procedure methods

Patients with dyspigmentation and lentigines require 2 to 3 treatments, whereas those with significant rhytides require at least 5 or more treatment sessions. Patients with melasma require multiple treatments at low fluence and density to prevent post inflammatory hyperpigmentation.

It has been recommended that patient receives prophylactic oral antivirals, such as acyclovir, famciclovir, or valacyclovir, starting 1 day before fractional resurfacing and continuing for 5 days postoperatively or until reepithelialization is complete. Oral antibiotics, such as dicloxacillin or azithromycin, may be prescribed to patients with a history of bacterial infections of the facial skin to reduce the chance of secondary bacterial infection.

Anesthesia. Topical anesthesia is required. Application EMLA or LMX cream for 60 minutes before the procedure is recommended. During the procedure, cold air cooling (Zimmer Medizin Systems, Irvine, Calif) is required to minimize discomfort. Some of the newer fractional resurfacing devices are reportedly painless.

During the laser procedure, tiny spots of the epidermis are coagulated and collagen in the adjoining dermis is denatured. Clinically there are no obvious exudates and complete re-epithelization occurs within 24 hours of the procedure.

2. Plasma skin resurfacing

A novel device for performing ablative resurfacing has been developed which works by passing radiofrequency into nitrogen gas. The "nitrogen plasma" causes rapid heating of the skin with limited tissue ablation and minimal collateral thermal damage. Several reports indicate improvement in facial rhytides and scars following treatment. Epidermal regeneration occurs by 7 days postoperatively with neocollagenesis visible on histologic analysis at 90 days(19). Comparative studies are needed to evaluate the safety and efficacy of this device as compared to CO_2 and Er:YAG laser resurfacing. Results appear to be similar to gentle CO_2 and Er:YAG laser resurfacing. The more aggressive the treatment-that is, the higher the fluence-the more impressive the results. Just where plasma resurfacing fits in the spectrum of resurfacing devices, however, remains to be seen.

3. Pigment Lasers

Pigmentary disorders are common and form a major part of cosmetic dermatological problems of Asian patients. In the mid 1990s, the Q-switched Nd-YAG laser was introduced and has remained one of the most widely used laser system for treating pigmentary disorders until today. When frequency-doubled at 532nm, it is used mainly to remove epidermal pigmentary lesions such as freckles, solar lentigines and café-au-lait macules and red coloured tattoos. The 1064nm wavelength is used mainly for more dermal pigmentary disorders such as Hori's nevus, nevus of Ota and black coloured tattoos. Other pigment lasers include the Q-switched Alexandrite (755nm) and Ruby (694nm) lasers. However these shorter wavelength lasers are best used on light skin type (Fitzpatrick skin type I-III). The shorter wavelengths tend to be cause epidermal burn and hypopigmentation as the epidermal melanin tends to take up the laser energy before it reaches the target chromophores. Recent reports have indicated that the pulsed dye laser at 595nm (under occlusion pressure) is just as effective in removing superficial pigmentation disorders such as lentigenes[20].

Other Devices/Procedures for Skin Rejuvenation

In recent years many new devices have been introduced to rejuvenate the skin viz skin tightening, photomodulation and photodynamic therapy.

1. Skin Tightening:
(a) Radiofrequency Devices
The radiofrequency wavelengths devices were introduced a few years ago to induce tissue heating and tightening for a "medical facelift" as a form of non-ablative skin rejuvenation. These devices (e.g. Thermacool,) utilizes radio-frequency (RF) energy to cause tissue resistance to flow of electrons to generate heat in tissues. It provides a uniform, intense and sustained heating in the dermis while cooling and protecting the epidermis. It is designed to cause immediate collagen contraction followed by new collagen production which occurs over a period of time. It is currently used predominantly for treating periorbital (around the eye) wrinkles, jowl line and neck skin sagging, A single treatment with this RF tissue tightening (RFTT) device produces objective and subjective reductions in periorbital wrinkles, measurable changes in brow position, and acceptable epidermal safety. These changes were indicative of a thermally induced early tissue-tightening effect followed by additional tightening over a time course consistent with a thermal wound healing response. The longevity of clinical results has yet to be determined.

Ruiz-Esparza et al[21] reported that 14/15 patients obtained cosmetic improvement from facial skin tightening[21]. Alster et al[22] reported that there were significant improvement in cheek and neck skin laxity in the majority of patients treated with the radio-frequency device[22]. Kushikata et al[23] from Japan reported that radio-frequency treatment was effective for nasolabial folds, marionette lines, and jowls with 70% of his patients reporting good or very good improvement[23].

Side effects from the radio-frequency devices included, pain, erythema, swelling (seen in >90%). Occasionally burns, blistering and skin discoloration (seen in about 5% of the patients) occur. Serious side effects reported include permanent depressions from treatment induced subcutaneous fat necrosis. Finzi et all reported that reducing the fluence and performing multipasses will help reduce side-effects and improve treatment outcome[24].

(b) Infra Red devices
The infra-red skin tightening devices works principally to increase in skin firmness/tightening by utilizing the infra-red energy to heat up the dermal tissue. It is used for reversal of skin laxity, lifting of sagging skin esp along the jowl line and underchin, reduction in skin crease lines (e.g. nasolabial folds) & wrinkles. An example of such a device is the Titan, (Cutera) device. The light source has a wavelength of between 1200nm-1800nm that is delivered in an integrated hand piece which provides contact cooling and infra-red light that deliver a uniform and prolonged heating of the deeper dermis (volumetric heating) of up to several seconds duration. The heating initiates 2 processes viz., collagen contraction which produce an immediate clinical effects followed by collagen remodelling over next 3-6 months resulting in longer term clinical results. The epidermis is protected via epidermal cooling. In a report from Singapore, xxx% experience improvements following treatment[25]. Its long term effects remains to be elucidated.

2. Photomodulation

Photomodulation utilizes a process where light delivered through light emitting diodes are used to activate cells causing them to produce collagen and elastin[26]. The light manipulates or regulates cell activity without thermal effect. Photomodulation has been reported to help improve skin texture and histological evidence of induction of increased collagen deposition with reduced MMP-1 (collagenase) activity in the papillary dermis. It has been used to treat a wide range of photoaged skin with a specific sequence of pulsing. In one study, subjects were evaluated at 4, 8, 12, 18 weeks and 6 and 12 months after a series of 8 treatments delivered over 4 weeks. Data collected included stereotactic digital imaging, computerized optical digital profilometry, and peri-ocular biopsy histologic evaluations for standard stains and well as collagen synthetic and degradative pathway immunofluorescent staining. The result reported a reduction of signs of photoaging in 90% of subjects with smoother texture, reduction of peri-orbital rhytids, and reduction of erythema and pigmentation. Optical profilometry showed a 10% improvement by surface topographical measurements. Histologic data showed markedly increased collagen in the papillary dermis of 100% of post-treatment specimens. Staining with anti-collagen I antibodies demonstrated a 28% (range: 10%-70%) average increase in density while staining with anti-matrixmetalloproteinase (MMP)-1 showed an average reduction of 4% (range: 2%-40%). No side effects or pain were noted[26].

3. Photodynamic Therapy (PDT)

Photodynamic therapy is a procedure whereby topical photosensitizer e.g. amino-levulanic acid(ALA) is applied on the skin prior to photostimulation with a certain wavelength of lights. The process is used for treating acne vulgaris by destroying P. acnes and sebaceous glands. It is used for treating actinic keratosis and recently used to enhance the effects of IPL in treatment photoaged skin (dyspigmentation, telangiectasia and superficial rhytides).

There are several variables in PDT procedures. Photosensitizers used in PDT includes 5-ALA and methyl-ALA in various vehicles. The skin is incubated with the ALA which is usually painted on the skin and left for about 30 mins to 3 hours. Various light sources have been used including red light, blue light, IPL and PDL. Patients should avoid sun exposure for 24 hours after the procedure.

PDT has recently be used to enhance the effect of IPL for photorejuvenation. Recent reports indicated that topical PDT using ALA + IPL gives good results for rejuvenation then IPL alone. Better improvements in "crow feet", telangiectasia and skin texture with rejuvenation was carried out on PDT than IPL alone[27]. Improvements has been reported after one treatment alone.

Adverse effects of PDT includes photodermatitis, hence the needs for complete sun avoidance after PDT for at least 24 hours

Conclusions

Over the past 2 decades there have been significant advances in the skin rejuvenation procedures. Advances in lasers ranging from ablative skin resurfacing lasers which is associated with prolong post-operation downtime to fractional resurfacing with short post-operation downtime has encouraged more patients to seek skin rejuvenation treatment. Radiofrequency devices and infra-red devices has allow skin tightening to complement resurfacing procedure to further enhance the effects of skin rejuvenation. However the efficacy and long term effects of many of these procedures remains uncertain and awaits further studies. Hence it may be prudent to adopt a conservative approach when offering and carrying out these procedures for our patients.

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Review

Evidence-based dermatology - A brief introduction

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Introduction

Since "evidence-based medicine" (EBM) was coined in 1992, much information and misinformation has been circulated about what evidence-based medicine is and isn't[1]. This is perhaps particularly true in dermatology where we have only recently begun to appreciably introduce its language and tools into our residency programs and practices[2]. David Sackett defines EBM as "integration of the best research evidence with our clinical expertise and our patient's unique values and circumstances[3]." This description emphasizes that EBM is not a "cookbook medicine." Rather, EBM combines the "state of the science" (which is often lacking in dermatology), with sound clinical judgment and knowledge of what makes our patients unique.

Clinicians have incorporated evidence into practice since long before Hippocrates. What makes EBM unique as a paradigm is the formalization of the process by which we assimilate, evaluate, and employ data[1]. EBM can be formalized into a series of logical steps[4]:

1. Formalizing your question into a well-built answerable question
2. Systematically searching out for the best evidence available
3. Critically appraising the evidence
4. Integrating the data with clinical expertise and patient values
5. Archiving the results and learning from 1-4

Step 1 helps formalize your question, making your inquiry more explicit, and fosters the next step to search for the evidence. Most clinical questions are in PICO format, involving a Patient, an Intervention, a Comparison, and a clinical Outcome. For example, "In a 22 year old female with mild chronic non-comedonal acne (the Patient) is prescription strength benzoyl peroxide monotherapy (Intervention) superior to over the counter salicylic acid monotherapy (Comparison) in preventing inflammatory papules from developing?" Online resources helpful in designing well-built clinical questions include Anatomy of a well-built clinical question (University of Sheffield) and constructing a well-built clinical question using PICO (University of Washington).

Step 2 involves systematically searching for relevant data to answer our questions[5]. The objective is to have a comprehensive search that will not miss the highest quality sources. When better sources are available, this step shuns textbooks and "experts" which tend to be outdated and vulnerable to bias. This search thus is geared preferentially towards the pinnacle of the "hierarchy of evidence." The best source of information, when available, is the systematic review (particularly comprised of randomized controlled trials when the clinical query pertains to therapy). Systematic reviews answer focused study questions through explicit a priori methods, and are exhaustive searches incorporating study quality when appropriate. In dermatology, Cochrane Systematic Reviews compiled by the Cochrane Skin Group (Figure 1) generally provide the best answers[6]. When these are not available and the question of interest pertains to a common skin condition, secondary journals such as Evidence-Based Medicine and ACP Journal Club provide structured abstracts to high quality studies and commentary helpful in their critical appraisal. Four times a year Archives of Dermatology features an evidence-based dermatology section with similar content. PubMed Medline is the most popular primary source, but most searches have a high noise to signal ratio. Pubmed's clinical query database is designed for searches with fewer false positive (undesired or irrelevant) references (Figure 2). In recent years there has been increased attention to evidence-based references, which in contrast to traditional textooks formally integrate quality of evidence and are frequently updated. These include UpToDate and Clinical Evidence. A high-quality text, Evidence-Based Dermatology[7] is also available, and can provide an excellent starting point for an up-to-date search. General and dermatology-specific guides on how to perform evidence-based searches are available[1,5,7-9].

Figure 1. Cochrane Skin Group (CSG)
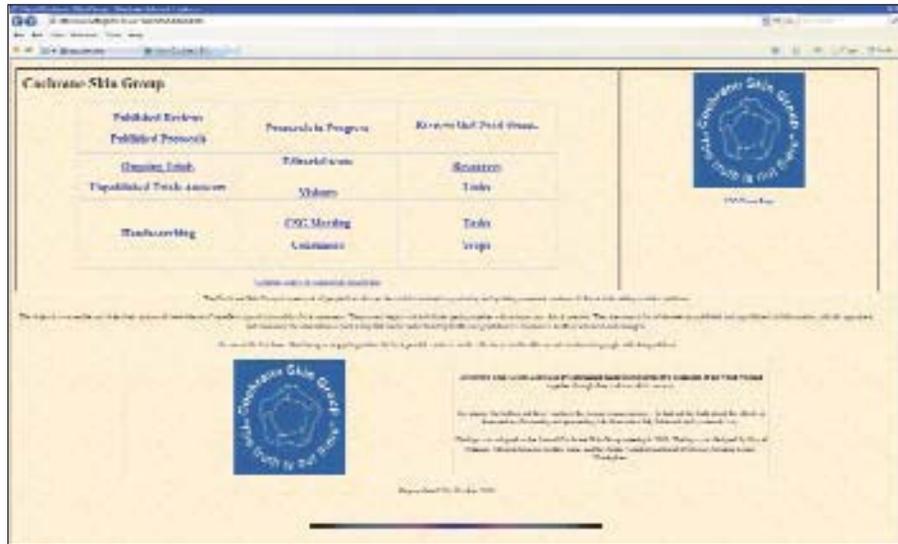
CSG is part of the Cochrane Collaboration, dedicated to preparing, maintaining and promoting the accessibility of systematic reviews on the effects of health care interventions. This site features abstracts of Cochrane systematic reviews which by design meet the highest review standards.

Figure 2. PubMed Clinical Query Tool

PubMed's Clinical Query tool was designed to clinical searches relevant to practice. Clinical searches can focus on etiology, diagnosis, therapy, prognosis, or clinical prediction rules. A narrow (specific) search will display the most relevant results whereas, a broad (sensitive) search prioritizes comprehensiveness. For most dermatology searches a narrow search is most appropriate to avoid being overwhelmed with the number of results.

Step 3 involves critical analysis of the data collected in step 2 to determine overall quality. For this purpose it is important to familiarize yourself with the basic terminology and concepts in clinical epidemiology as it pertains to study quality[10-12]. A good study is reasonably free from bias and confounding errors (systematic errors), includes an adequate number of patients (i.e., is adequately powered to detect clinically important differences), and is relevant to your patient. Although a full review of critical appraisal is beyond the scope of this overview (entire books are published on the subject), the hierarchy of evidence offers a general rule to start with: systematic reviews of randomized trials are superior to randomized trials, which are superior to cohort and other study designs, which in turn are superior to case reports and expert opinion. It is important to emphasize here that this rule by itself is inadequate since well-designed observational study may be more meaningful than a poorly designed or executed trial. For further reading on critical appraisal of study design, the Centre for Health Evidence (CHE) offers an online User Guide (based on a JAMA series by the same title).

Step 4 relates to individualizing care and critically evaluating the context of the clinical problem[13-15]. In step 3, we examined internal validity (how free it is from bias), but just as important is external validity, or how generalizable it is to your patient group and setting, which may be very different. Your 25 year old patient with mild 10% BSA psoriasis probably won't respond the same as a 50 year old female patient in a tertiary care setting. Incorporating patient preferences and social settings into clinical decisions is imperative for compliance, patient rapport, and better outcomes. The Centre for Health Evidence offers a brief checklist to assist with these considerations.

Step 5 has us ask ourselves what we have learned from Steps 1-4 in order to improve our next search. Storing our results for future reference is also valuable. Citation managers like EndNote store this information electronically and permit efficient sorting and searching of references.

Online, the most comprehensive listing of evidence-based dermatology resources can be found at the United Kingdom's National Library of Health Skin Disorders Specialist Library. This massive initiative, funded by the United Kingdom's National Health Service (NHS) indexes high quality, evidence-based information on all of aspects of skin disorders for patients and providers.

ebDerm.org is another online evidence-based dermatology resource with a slightly different focus- a mission to teach and disseminate evidence-based dermatology. While the current version of this website includes an annotated guide to selected web-based evidence-based dermatology resources and PowerPoint guide, it is undergoing a major expansion with grant support from the Sulzberger Institute. This update will permit multimedia resources and collaborative evidence-based learning projects on August 1st 2007. This will include ebDerm Learning, a comprehensive guide to web-based resources, ebDerm Library, a digital library of evidence-based dermatology materials, and the ebDerm Community. A key highlight of this expansion will be the teaching of EBM via participation in a Critically Appraised Topic (CAT) clinical query based learning tool. Residents, dermatologists, and dermatology training programs interested in participating may contact the author of this publication at david@skinresearch.org.

Like any other skill, proficiency in EBM searches (and efficiency obtaining your answer!) increases with consistent practice. This brief informal narrative was not intended to be comprehensive, but rather to whet your appetite for further reading on how EBM can be operationalized into practice. The author sincerely hopes that this most important learning objective was encouraged by the overview presented. Of the references below, 8 and 9 provide EBM guides focused on dermatology.

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Original Article

Treatment of naevus of Ota with Q-switched 1064nm Nd:YAG laser

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Abstract

Background Naevus of Ota was first described in 1939 by Ota M. It is characterized by a bluish-gray mottled hyperpigmentation in the distribution of the trigeminal nerve. It affects between 0.014 - 0.6% of the Asian population. It is not only physically disfiguring but may be associated with tremendous psychosocial impact on the patient. The aim of the study is to determine the demographic data of local patients with naevus of Ota, their response to treatment with Q-switched 1064nm Nd:YAG laser, complications and recurrence.

Materials and Methods A retrospective analysis of all patients with naevus of Ota treated with Q-switched 1064nm Nd:YAG laser between January 1998 to December 2007 was conducted at the dermatology clinic, Kuala Lumpur Hospital. Patients' demographic data, clinical characteristics, response to Q-switched 1064nm Nd:YAG laser and the complications were reviewed.

Results A total of 50 patients with naevus of Ota were treated with Q-switched 1064nm Nd:YAG laser. There were 42 female and 8 male patients with a F : M ratio of about 5:1. The mean age of presentation was 31 years old (11-60 years). More than half were Chinese patients (56%) followed by Malays (38%), Indian (2%) and others (4%). Seventy four percent of the patients had Fiztpatrick skin-type IV and the rest skin type V. Ninety two percent of the patients had unilateral trigeminal dermatomal involvement while 8% had bilateral trigeminal dermatomal involvement. Of the 15 patients who were referred to the ophthalmologist, 10 were found to have scleral involvement and none had glaucoma. Patients who had 2 treatments (13 patients) did not have any significant lightening of their lesions. In the remaining 37 patients who had 3 sessions (mean = 5.7, range 3 -15 sessions), 9 patients (24.3%) reported the response as good (51-75% lightening); 17 patients (45.3%) as excellent (>75% lightening) and 8 patients (22%) had near complete lightening (>90%). None reported any complications or recurrence.

Conclusion Q-switched 1064nm Nd:YAG laser is an effective and safe treatment modality for patients with naevus of Ota.

Keywords Naevus of Ota, Q-switched 1064nm Nd:YAG laser, Fitzpatrick skin-type IV and V

Introduction

In 1939 Ota M reported "nevus fusco-caeruleus ophthalmomaxillaris and melanosis bulbi" or naevus of Ota, which was described as a bluish-gray mottled hyperpigmentation along the first and second divisions of the trigeminal nerve with frequent mucosal involvement. It affects between 0.014 - 0.6% of the Asian population[1-3]. There is a female predominance with a female to male ratio of 3 to 5:1. Extracutaneous involvement in naevus of Ota includes ocular pigmentation affecting the sclera, iris and conjunctiva; glaucoma, uveitis, cataract and rarely orbital and cerebral melanoma[1,3]. However, they are uncommon. Most patients with naevus of Ota suffer from tremendous cosmetic disfigurement and psychological impact due to the highly visible distribution of the lesions and their persistence over time. This has encouraged patients to seek treatment. Prior to the advent of laser surgery, dermabrasion and cryotherapy were the main therapeutic options but they usually result in scar formation and post treatment hyperpigmentation. Laser treatment of naevus of Ota on the other hand has been shown to be very safe and effective.

Materials and methods

This is a retrospective study of all patients with naevus of Ota who were treated with Q-switched 1064nm neodymium:yttrium-aluminium-garnet (Nd:YAG) laser between January 1998 to December 2007 at the Department of Dermatology, Kuala Lumpur Hospital. Diagnosis of naevus of Ota was made clinically by a dermatologist. Study parameters reviewed included

patients' demographic data, their clinical characteristics, clinical response to Q-switched Nd:YAG laser and complications.

Q-switched 1064nm Nd:YAG laser (Versa Pulse Aesthetic) was used in this centre. Informed consent was obtained from all patients before their laser treatment.

The degree of response to laser treatment was graded by patients according to the lightening of lesions. "Excellent" response was defined as more than 75% lightening; "Good" response as lightening of between 50-75%; "Moderate" response as lightening of between 25-50% while "Poor" response as less than 25% lightening. The data findings were analyzed using SPSS 16.0 statistical analysis for Windows.

Results

Fifty patients seen at the dermatology clinic Hospital Kuala Lumpur with a diagnosis of naevus of Ota were treated with the Q-switched 1064nm Nd:YAG laser during the period of January 1998 to December 2007. The demographic data of all the patients are summarized in Table 1. There were 42 female and 10 male patients with a female to male ratio of 5.25:1. The mean age of presentation was 31 years old. The youngest patient treated was 11 years old while the oldest patient was 60 years old. Of the 50 patients, more than half 28 (56%) were Chinese, followed by Malays 19 patients (38%), Indian (2%) and two foreigners (4%). Thirty seven patients (74%) had Fiztpatrick skin type IV and the rest had skin type V. The facial areas involved in our group of patients are shown in Table 2. Ninety two percent of the patients had unilateral trigeminal dermatomal involvement while 8% had bilateral trigeminal dermatomal involvement. The color of the nevus at first presentation included brown, blue, black or grey.

Sixty percent of the patients developed the nevus at birth or within the first year of life. None had any other concomitant congenital skin lesions such as port wine stain or hemangioma. Only 4 patients had tried other treatments included depigmentation cream, carbon dioxide laser and Q-switched Nd:YAG in private clinics before presenting to us. Only one patient had a family history of a similar lesion. Fifteen patients were referred to the ophthalmologist for assessment. Ten were found to have scleral hyperpigmentation, 1 conjunctival involvement but none had glaucoma.

Majority of the patients were treated at intervals between 2-4 months (ranging from 2 months to 2 years). The affected area was treated at energy fluences of 3.8-5J/cm^2 with a spot size diameter of 3mm.

The clinical results of laser treatment are demonstrated in Table 3. Of the 50 patients treated, 7 (14%) had only one treatment while 6 (12%) had 2 treatments and all of them did not have significant lightening of their lesions (<50% of lightening of lesions). In the remaining 37 patients who had 3 sessions (mean = 5.7, range 3-15 sessions), 9 patients (24.3%) reported the response as good (51-75% lightening); 17 patients (45.9%) as excellent (>75% lightening). Eight patients (22%) had near complete clearance (>90%). Twenty one out of 27 patients (78%) with Fiztpatrick skin type IV reported to have good or excellent result. On the other hand, 50% of patients with Fiztpatrick skin type V had good or excellent result. The different treatment result between the 2 groups of patients however was not statistically significant.

Table 1. Patient demographics and baseline clinical characteristics

Characteristic		N=50
Mean age in years (range)		31.1 (11-60)
Ethnic	Malay	19 (38%)
	Chinese	28 (56%)
	Indian	1 (2%)
	Others	2 (4%)
F : M ratio		5.25:1
Mean duration of lesion in years (range)		27.2 (7-59)
Fiztpatrick skin type	IV	37 (74%)
	V	13 (26%)

Table 2. Distribution of naevus of Ota

Trigeminal nerve dermatone	Left	Right	Bilateral	Total (%)
V1	1	4	1	6 (12)
V1, 2	10	14	2	26 (52)
V2	9	6	1	16 (32)
V1, 2, 3	1	1	0	2 (4)
Total (%)	**21 (42)**	**25 (50)**	**4 (8)**	**50 (100)**

V1 – Ophthalmic branch; V2 – Maxillary branch; V3 – Mandibular branch

Table 3. Results of treatment with the Q-Switched 1064nm Nd:YAG laser according to Fiztpatrick skin type

No of laser treatment	Fitzpatrick Skin type IV						Fitzpatrick Skin type V						TOTAL (%)
	No of pt	Response (patient assessment)					No of pt	Response (patient assessment)					
		0	1	2	3	4		0	1	2	3	4	
1	6	5	0	1	0	0	1	0	1	0	0	0	7 (14)
2	4	3	1	0	0	0	2	2	0	0	0	0	6 (12)
3	4	0	1	1	1	1	4	2	0	2	0	0	8 (16)
4	6	0	1	2	1	2	1	0	0	0	1	0	8 (16)
5	3	1	0	0	0	2	2	0	0	0	1	1	4 (8)
≥6	14	0	0	0	4	10	3	0	0	1	1	1	17 (34)
Total	37	9	3	4	6	15	13	4	1	3	3	2	50

0 – no response; 1 – Poor response (<25% lightening); 2 – Moderate response (25–50% lightening);
3 – Good response (50–75% lightening); 4 – Excellent response (>75% lightening)

Figure 1. A 44-year-old Chinese woman with naevus of Ota of right ophthalmic and maxillary dermatome before and after 9 laser treatments, near complete clearance can be noted.

Before Laser treatment

After 9 sessions of Q-switched 1064nm Nd:YAG

All patients had topical anesthetic EMLA (eutectic mixture of local anesthetics) cream one hour before laser therapy. Despite the EMLA, all patients experienced a certain amount of pain with 62% reporting as moderate and 10% as severe. Two patients (4%) developed significant edema at the site of treatment. Topical chloramphenicol ointment was applied to the area treated immediately after the laser therapy in all patients, unless they are allergic to it. Twenty percent of patients (10) were treated with a course of systemic antibiotic such as erythromycin, cefuroxime and cephalexin to prevent any cutaneous infection from the raw wound. None of our patients developed late complications such as hypo- or hyperpigmentation, textural changes or scar formation. None have experienced any recurrence as yet.

Discussion

Naevus of Ota is a benign oculodermal melanocytosis which is commonly seen in Asians. The cause of the naevus is not fully known. More than 50% of lesions are present at birth whereas 40% manifest during puberty[1]. Some have hypothesized that sex hormones play a role in its pathogenesis, given the female predominance, the appearance of lesion at the onset of puberty in many cases and reports of color variation with the menstrual cycle[4].

In naevus of Ota, spindle-shaped dendritic melanocytes which contain large amount of melanin are present in the deeper layers of the reticular dermis. Laser treatment of naevus of Ota is based on the destruction of melanosomes and melanocytes by absorption of laser light of specific wavelengths. This is explained by the concept of selective photothermolysis where the most selective thermal damage occurs when energy is delivered faster that the rate of cooling, or thermal relaxation time of a given target ("chromophore")[6]. The family of Q-switched lasers is the current standard therapy for naevus of Ota, achieving selective photothermolysis by having a pulse duration briefer than the thermal relaxation time of melanosomes (less than 1msec)[5-7]. Q-switched 1064nm Nd:YAG laser has the longest wavelength and is associated with the deepest penetration into the skin and consequently may be of theoretically greater benefit in individuals with darker skin such as Fiztpatrick IV and V.

The clinical efficacy of Q-switched 1064nm Nd:YAG laser was demonstrated in our center. Patients who had had only one or two treatment sessions had only poor or moderate response. Therefore, the patient and the treating dermatologist should not expect much lightening of lesion in the first 2 treatment sessions. In our series, all good and excellent responses were the result of three or more treatments. Seventy percent of those who had 3 or more treatment sessions had good or excellent results. There was no difference in the clinical response between patients with Fiztpatrick skin type IV and V.

Pain and bleeding are common immediately after the laser treatment. All patients should be well informed about the immediate reactions. Long term complications such as scar formation, pigmentation and textural changes were not seen in our series of patients. None of our patients has reported any relapse of their lesions.

Three types of Q-switched lasers have been used widely to treat naevus of Ota. These include the Q-switched 694nm Ruby laser, Q-switched 755nm Alexandrite laser and the Q-switched 1064nm Nd:YAG laser[8]. Previous studies have shown that all of them were able to provide excellent results in treating naevus of Ota[10-14]. The first prospective study comparing the clinical efficacy of Q-switched Alexandrite and Q-switched 1064nm Nd:YAG laser in the treatment of naevus of Ota among Hong Kong patients was done by Chan HH et al[9]. Their findings indicate that Q-switched 1064nm Nd:YAG laser is more effective than Q-switched alexandrite in the lightening of naevus of Ota. In darker-skinned (Fiztpatrick skin type IV-VI), the Q-switched Nd:YAG laser at 1064nm is usually the safest laser to lighten a naevus of Ota. In lighter-skinned patients, Q-switched ruby laser at 694nm and Q-switched alexandrite laser at 755nm can also be used. Currently there is no effective treatment for the scleral pigmentation of naevus of Ota.

Generally, the interval between laser treatments should be at least 2-3 months in order to permit maximal lightening from each treatment and allow time for post inflammatory hyperpigmentation to clear if it has developed after treatment15. In our series of patients, the interval between the treatments ranged from 2 months to 2 years. Longer treatment intervals of more than 6 months were arranged according to patients' preference and conveniencet. Study has shown that maximum and stable lightening of the lesions is usually seen 1-2 years after the last treatment[12]. Therefore the clinical response would not be greatly affected by longer interval between laser treatments.

Q-switched 1064nm Nd:YAG laser is a safe and effective treatment modality for naevus of Ota in patients with Fitzpatrick skin types IV and V. Three or more laser treatment is required for any significant clinical response.

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Original Article

A retrospective study of Q-switched Nd:YAG laser in the treatment of Hori's naevus

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Abstract

Background Hori's naevus is an acquired bilateral naevus of Ota-like macules (ABNOM). It was first reported by Hori et al in 1984. It is common among Asians and has a female preponderance. Hori's naevus is characterised by blue-brown macules typically on the malar region of the face.

Objectives To evaluate the clinical characteristics of patients with Hori's naevus seen at Hospital Kuala Lumpur and the efficacy of Q-switched neodynium-yttrium-aluminium-garnet (Nd:YAG) laser in the treatment of this condition.

Method A retrospective analysis of 16 patients diagnosed clinically with Hori's naevus and treated with Q-switched Nd:YAG laser was carried out. Patient's demographic data and clinical characteristics, response to Q-switched Nd:YAG laser, complications and recurrence were reviewed.

Results A total of 16 patients diagnosed clinically with Hori's naevus and treated with Q-switched Nd:YAG laser were reviewed. Fifteen of the patients were female with one male. Their ages ranged from 33-61 years old (mean age = 47). Nine of these patients were Chinese with seven Malays. All had Fitzpatrick skin phototype IV. The age of onset ranged from 15-45 years old. The most common clinical presentation was bilateral brown macules on the malar region of the face. Eleven patients received treatment with Q-switched 1064nm Nd:YAG and five combination treatment with Q-switched 532nm Nd:YAG followed by 1064nm laser. Two patients were lost to follow up after a single treatment. After a single treatment, 13 patients graded their clinical response as 'poor' (0-25% improvement) and 1 as 'fair' (26-50% improvement). Six patients received a total of two treatments of whom 4 graded their response as 'fair' (26-50% improvement) and 2 as 'good' (51-75% improvement). Two patients who received a total of four treatments graded their responses as 'good' and 'excellent' (76-100% improvement) respectively. 10 patients had significant hyperpigmentation post laser treatment. However, none reported any recurrences.

Conclusion There is no difference in pigment clearance between concurrent use of Q-switched 532nm Nd:YAG laser followed by 1064nm laser and Q-switched 1064nm Nd:YAG laser for Hori's naevus. However, there is only minimal improvement after a single treatment, and multiple sessions are required to achieve satisfactory improvement. Post inflammatory hyperpigmentation was the main complication seen.

Keywords Hori's naevus; Q-switched Nd:YAG laser; Fitzpatrick skin type IV

Introduction

Hori's naevus is an acquired bilateral naevus of Ota-like macules (ABNOM). It was first described in the Japanese population by Hori et al in 1984[1]. It is one of two primarily dermal dyschromasia seen in Asian population, the other being naevus of Ota. The prevalence of Hori's naevus is about 0.8% in the Asian population[2]. There is a higher preponderance among the female population, with an age of onset ranging from 4th to 5th decades of life[3]. Hori's naevus is characterized by blue-brown and or slate grey macules, most frequently on the malar region of the face. Other areas of involvement include bilateral forehead, temples, eyelids, nasal alae and nasal root[4]. Unlike the naevus of Ota, Hori's naevus does not involve the ocular or mucous membranes.

There has been a dearth of reported treatment modalities utilized to manage this disfiguring, psychologically distressing cosmetic condition. However, Hori's naevus is known for its recalcitrance to conventional treatments.

Cryotherapy has been found to produce unpredictable results. Dermabrasion showed promising results after a single session, but the major disadvantage of this technique is the risk of bloodborne contamination and uncontrolled depth of ablation[4].

Q-switched Nd:YAG laser has been reported in the literature to produce excellent results with minimal risk of complications. This review was designed to evaluate the clinical characteristics of patients with Hori's naevus seen at Hospital Kuala Lumpur and the efficacy and safety of Q-switched Nd:YAG laser in the treatment of this condition in our local setting.

Materials and methods

A retrospective analysis of 16 patients from Hospital Kuala Lumpur with a clinical diagnosis of Hori's naevus was performed. Patients received treatment with either Q-switched 1064nm Nd:YAG or combination treatment with Q-switched 532nm Nd:YAG followed immediately by 1064nm laser. Patient's demographic data and clinical characteristics, response to Q-switched Nd:YAG laser, complications and recurrence were reviewed.

The degree of clearance following laser treatment was categorized into 4 grades, ranging from excellent to poor. 'Excellent' response was defined as 76-100% clearance; 'Good' as 51-75% clearance, 'Fair' as 26-50% clearance and 'Poor' as 0-25% clearance.

Results

A total of 16 patients diagnosed clinically with Hori's naevus and treated with Q-switched Nd:YAG laser were reviewed. There is a predilection for female gender, with 15 female and 1 male in our series. Their ages ranged from 33-61 years old (mean age = 47). Of the 16 patients, 9 (56%) were Chinese and 7 (44%) were Malays. All of them had Fitzpatrick skin phototype IV. The age of onset of Hori's naevus ranged from 15-45 years old (Table 1).

The most common colour at presentation was brown 11 (68.7%), followed by blue 3 (18.8%) and black 2 (12.5%). All the patients presented with either macules (75%) or patches (25%) on the malar region of the face. Five (31.3%) of the patients reported a positive family history of a similar facial condition, which primarily affected a first degree relative, mainly their mothers or sisters. Four (25%) patients tried various topical depigmenting agents bought over-the-counter without much success prior to their laser therapy.

Eleven (68.7%) patients received treatment with Q-switched 1064nm Nd:YAG whilst the remaining 5 (31.3%) received a combination treatment with Q-switched 532nm Nd:YAG followed by 1064nm laser. Two patients were lost to follow up after a single treatment. The rest of the patients have received treatments ranging from 1-4 sessions. The laser treatments and outcomes are summarized in Table 2 and Table 3. Six (37.5%) patients received only a single laser treatment, six (37.5%) received 2, while the remaining four received 3 and 4 laser sessions respectively.

Table 1. Patient demographics and baseline clinical characteristics

Characteristics		N=16
Mean age in years (range)		47.0 (33-61)
Ethnic	Malay	7 (44%)
	Chinese	9 (56%)
	Indian	0
Female : Male ratio		15:1
Age of onset in years (range)		14-45

Table 2. Result of treatment with Q-switched 532nm Nd:YAG followed by 1064nm laser (n=5)

No of laser treatments	No of patients	Response (Patient assessment)			
		Poor	Fair	Good	Excellent
1	2	1	1	0	0
2	2	0	1	1	0
3	1	0	0	0	1
4	0	0	0	0	0
Total	**5**	**1**	**2**	**1**	**1**

Table 3. Result of treatment with Q-switched 1064nm Nd:YAG laser (n=11)

No of laser treatments	No of patients	Response (Patient assessment)				
		Poor	Fair	Good	Excellent	Unknown
1	4	2	0	0	0	2
2	4	0	3	1	0	0
3	1	0	0	1	0	0
4	2	0	0	1	1	0
Total	**11**	**2**	**3**	**3**	**1**	**2**

**Response   1. Poor = 0–25% improvement   2. Fair = 26–50% improvement
*   3. Good = 51–75% improvement   4. Excellent = 76–100% improvement*

Figure 1. A 45-year-old Malay female, before and after 2 laser treatments, with 'fair' response
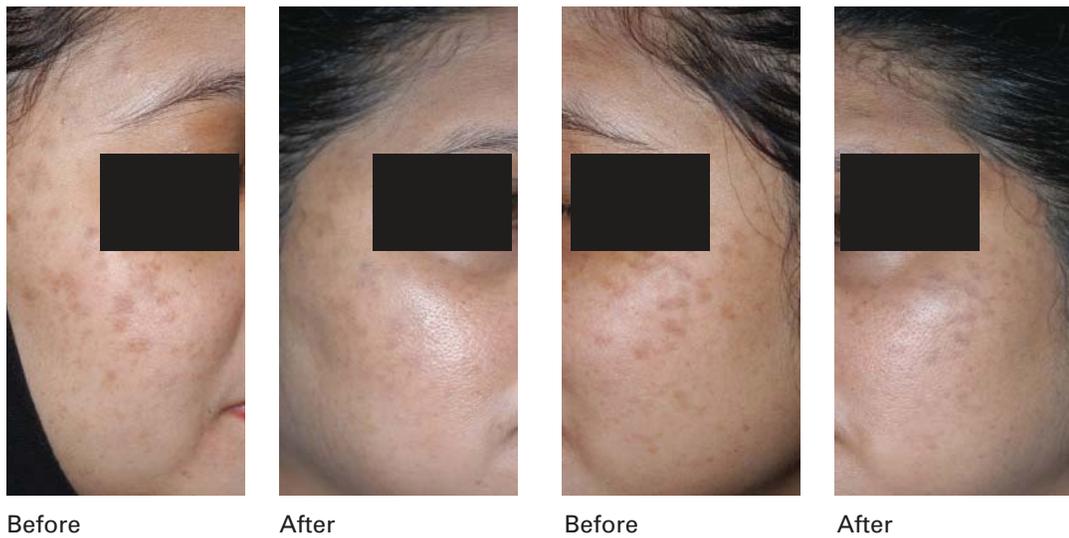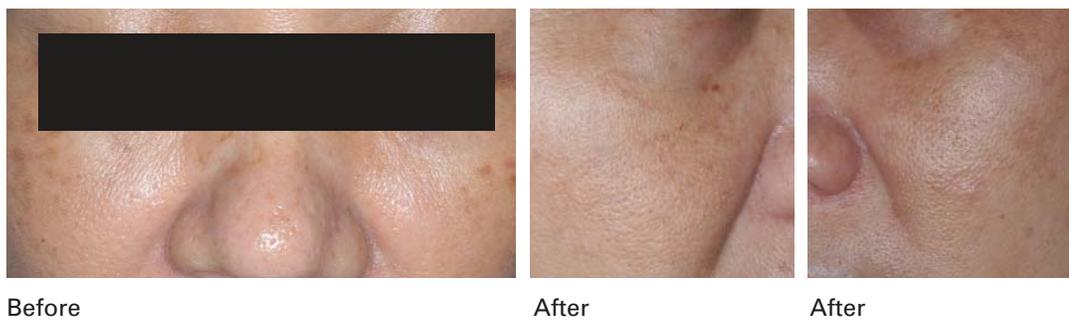

Before   After   Before   After

Figure 2. A 34-year-old Chinese, before and after 3 laser treatments with 'good' response

Before   After   After

After a single treatment, 13 patients graded their clinical response as 'poor' (0-25% improvement) and 1 as 'fair' (26-50% improvement). Out of the 6 patients who received a total of 2 treatments, 4 graded their response as 'fair' (26-50% improvement) and 2 as 'good' (51-75% improvement). The 2 patients who received a total of 3 laser treatments reported the degree of clearance as 'good' and 'excellent' (76-100% improvement) respectively. The other 2 patients who received a total of 4 laser treatments reported the same results, i.e. 'good' and 'excellent' respectively.

There is no significant difference in response between treatment with Q-switched 1064nm Nd:YAG and combination treatment of Q-switched 532nm Nd:YAG followed by 1064nm laser. As for complications, majority, i.e. 10 (62.5%) patients reported hyperpigmentation developing within a week post laser therapy. One patient (6.25%) developed hypopigmentation, but none reported scarring, erythema or textural changes related to laser treatment. So far, none of our patients had reported any recurrences.

Dicussion

Hori's naevus is an acquired dermal melanocytosis occurring more commonly among the Asian population. Three mechanisms have been postulated to be involved in the pathogenesis of this dyschromasia: (i) Epidermal melanocyte migration; (ii) Hair bulb melanocyte migration; and (iii) Reactivation of immature resting dermal melanocytes triggered by an unknown event. In addition, ultraviolet exposure has been postulated to induce melanogenesis via induction of tyrosinase activity and hormonal disequilibrium in pregnancy has been implicated due to reactivation of latent melanocytes in the dermis[5].

Histopathologic examination shows active melanin synthesizing melanocytes dispersed mainly in the papillary and mid dermis[6]. Epidermal hyperpigmentation is a prominent feature in Hori's naevus and as a result, an important cause of post-laser hyperpigmentation.

Several types of laser modalities have been widely used for the management of Hori's naevus. These include Q-switched 694nm ruby laser, Q-switched 532nm Nd:YAG laser, Q-switched 1064nm Nd:YAG laser, Q-switched 755nm Alexandrite laser and Scanned CO_2 laser followed by Q-switched 694nm ruby laser.

H.L. Ee et al had done a prospective study among Singaporeans comparing the effectiveness of monotherapy with Q-switched 1064nm Nd:YAG laser versus concurrent use of Q-switched 532nm Nd:YAG laser in combination with the 1064nm laser. They concluded that the latter is more effective[7]. Our study did not show any significant difference between the 2 regimens, but this could be due to our relatively small sample size.

In our centre, we observed that patients did not fare so well after a single laser treatment. However, all of them recorded 'good' or 'excellent' responses after 3 to 4 sessions of laser treatment. Ten (62.5%) patients developed hyperpigmentation within a week post-laser therapy, which was similar to other studies with incidences ranging from 50%-73%[2]. One patient (6.25%) reported both hyperpigmentation and hypopigmentation post-laser, but none developed scarring, erythema or textural changes.

Patients are treated at two monthly intervals. This is to allow any post inflammatory hyperpigmentation that may develop to resolve adequately. So far, none of our patients has reported any recurrences of their lesions.

Conclusion

There is no difference in pigment clearance between concurrent use of Q-switched 532nm Nd:YAG laser followed by 1064nm laser and Q-switched 1064nm Nd:YAG laser for Hori's naevus. A single treatment only result in minimal improvement and multiple treatments are needed for total clearance. An important issue associated with Q-switched Nd:YAG laser treatment of Hori's naevus is post inflammatory hyperpigmentation, which remains a challenge to dermatologists managing this condition.

References

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