The use of laser therapy in dermatology (benign pigmented lesions)

In pigmented epidermal lesions, the laser target is the melanosome contained the melanin pigment. A melanosome measures approximately 1 × (0.5–0.75) μm in diameter, and has thermal relaxation time about 10–100 n sec. Melanin has a broad absorption spectrum, being most intense in the ultraviolet (UV) range, dropping off through the visible to the near infrared (IR) spectra. During laser therapy of pigmented lesions, whatever the mode of pigment destruction (pressure waves, shock waves, or chemical alteration), destroyed or chemically altered melanin pigment is largely removed by macrophages. There are many laser types that can be used to treat pigmented lesions. Q-switched ruby laser emits a read beam of 694 nm wavelength with 20 to 50 n sec pulse duration. Many epidermal pigmented lesions could be treated by this type of laser (lentigo senilis, lentigo simplex, ephelides, syndromal lentigens, and café-au-lait macules). Pigmented Lesion Dye Laser produces pulsed green light at a wavelength 500–520 nm, with pulse duration 300–500 n sec. It is more suitable for superficial lesions only like ephelides, café-au-lait macules, and Becker's nevi (penetration depth is only 0.25–0.5 mm). Q-switched Nd: YAG laser (1064 nm wavelength, and pulse duration 10 n sec) is highly effective for deep, densely pigmented tattoos. Frequency Doubled Q-switched Nd: YAG laser with 532 nm green beam, and pulse duration of 10–40 n sec is useful for epidermal pigmented lesions and café-au-lait macules. Another laser machine for pigmented lesions is the Flash Lamp Q-Switched Alexandrite laser. It emits a near infrared invisible beam at 755 nm wavelength, and pulse duration of 100 n sec. It is used successfully for deep, black, green, red, and yellow tattoos. Nevus of Ota is treated well with the Q-switched Ruby Laser with energy fluence of 6–10 J/cm2 at 40 n sec pulses. Argon laser produced resolution of the nevus of Ota lesions but with some hypo pigmentation. Post inflammatory hyper pigmentation showed an average improvement by over 75% when Pumped Dye Pulsed Laser (Candela) is used. Melasma is treated by Candela PDPL, Q-Switched Alexandrite, Q-Switched Ruby, and Q- YAG laser. Unfortunately, although results are initially encouraging, repigmentation is the rule in all lasers used.

Biography
Ossama Hussein Roshdy is a Professor in the Department of Dermatology and Venereology at the University of Alexandria, Egypt.

drossamahu@hotmail.com

Notes: