Managing Port-Wine Stains with Lasers

Keeping up to date on developments in the field of laser therapy enables pediatric care providers to refer appropriate patients for treatment.

A Q&A with E. Victor Ross, MD

One of the more unique dermatologic conditions seen in pediatric patients is the port-wine stain (PWS). Occurring in roughly three out of every 1,000 newborns, port-wine stains are birthmarks that often present with a flat, pink appearance. Depending on size and location, there are a variety of treatment approaches to port-wine stains, including freezing, surgery, and radiation. Energy devices have emerged as a primary treatment approach that, if used properly, can provide effective results.

What unique challenges do port wine stains pose for treatment, particularly in the pediatric population?

There are a number of potential challenges in treating PWS, according to Dr. Ross, such as the difficulty of achieving complete clearance. “My experience has been that treatment should be carried out as early as two months of age and treatments ultimately should be carried out approximately every six to 12 weeks until the lesion is reasonably clear,” notes Dr. Ross. “Our clearance rates typically are up to 60 percent to 80 percent after six to eight treatments,” he continues. However, he further observes that treatment success depends on a number of factors, such as the patient’s overall skin pigment and location of the port-wine stain. “Various articles have pointed out, for example, that central facial lesions or central facial portions, particularly along the nose and central face, are more resistant to treatment,” Dr. Ross says. “There is also great variability in responses to treatment. Darker-skinned patients present a problem because of the epidermis being an absorptive of light.” This can largely be overcome by the use of aggressive cooling, either in the form of cold air, contact cooling, or the cryogen spray cooling, according to Dr. Ross.

What laser systems are available for the treatment of port-wine stains?

“Particularly in the pediatric population, the pulsed dye laser still enjoys the reputation of being the gold standard in the typically salmon-pink or red port-wine stains,” says Dr. Ross. “The pulsed dye laser enjoys a good safety profile, particularly with the addition of surface cooling over the past 10 years. In addition, it is typically well-adapted to treat port-wine stains in children as the vessel size typically is not as large as in adults and nodules...
are unusual,” he notes. Other lasers that have been used in children with PWS include the Alexandrite laser and the neodymium-YAG laser, as well as intense pulse light, the 810nm diode laser, and a long pulse green laser, such as the frequency double neodymium-YAG laser at 532nm, Dr. Ross says.

“The lighter port-wine stains or pinker port-wine stains typically respond best to the visible light wavelengths including IPL, pulsed dye laser, and KTP, and if you had an older child or a child with some premature nodules and port-wine stain, one could consider using the Alexandrite laser or neodymium-YAG laser,” Dr. Ross observes.

“I would caution that the longer wavelength lasers, particularly the Alexandrite and neodymium-YAG certainly can cause problems with excessive fluences, including deep scars. These should be used with some trepidation,” Dr. Ross says. “Certainly the neodymium-YAG can be used to treat nodules, but even then only with very low fluences.”

The Alexandrite laser can be used, but should be used very conservatively because there is a very fine line between under-treatment and over-treatment, notes Dr. Ross. “Ultimately, these are two lasers where I do feel that test spots probably are still indicated. The pulsed dye laser has such a good safety record that certainly test spots in experiences hands are not necessary.”

**How do different types of lasers and wavelengths provide different results?**

“The visible light devices (including the 532nm laser, the pulsed dye laser at 595nm, and the KTP lasers) all provide relatively similar results, although I feel that in very fine, light, pink port-wine stains, shorter pulse is important and even purpuric settings can work more effectively,” says Dr. Ross. He continues that these features are exclusively within the domain of the pulsed dye laser at this point.

**Can laser treatments be used effectively in combination with other therapies to treat port-wine stains?**

Dr. Ross observes that there may be several different options for combination approaches to port-wine stains with light devices. “Aldara (imiquimod, Graceway) has been used as a co-therapy with pulse dye laser, but most trials have shown only a very moderate, if any benefit to using this in conjunction with laser therapy,” he says. One of the concerns with port-wine stains is there is a tendency for angiogenesis after the insult by the light device, therefore one of the goals of using Aldara is to suppress the angiogenesis afterwards, according to Dr. Ross.

Dr. Ross also notes that other topical agents have been used in combination with light device therapy, such as rapamycin. In addition, photodynamic therapy has been used with various vascular specific photosensitizers, particularly in China. “Although there have been some good results, once again, there is a tendency or a risk of overtreatment with vascular necrosis,” says Dr. Ross. At this point, in America, it is still an investigational approach, he observes.

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