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Dye Laser Treatment of Port Wine Stain & Hemangioma Birthmarks

What is a Port Wine Stain?

A Port Wine Stain (PWS) is a pink to purple birthmark composed of an abnormal collection or network of dilated blood vessels present beneath the skin. The PWS was so named because the skin appears as though a red, pink or purple liquid, such as port wine had been poured over it.

What causes a PWS?

The cause of PWS is unknown. The dense network of vessels is a remainder of extra blood vessel tissue that was present during the first month of embryologic life. There is no significant genetic or inherited tendency. There is no factor during pregnancy that is known to cause or predispose one to develop a PWS.

What is the natural history of the Port Wine Stain?

Port Wine Stains are present on the skin at birth and appear to grow at the same rate as the surrounding tissues. The birthmarks often appear as flat, pink blanchable stains through the first two decades of life, but often subsequently darken and thicken in the third through fifth decade of life. Furthermore, the surface of the PWS which may have been quite smooth during the first decade of life, may develop an irregular and lumpy 'cobblestone' appearance by the time the patient is in their 40's, 50's or 60's. These lesions may break down, bleed or be a source for infection and may potentially become more physically and emotionally deforming.

Can a Port Wine Stain be associated with other problems?

PWS on the face can be associated with significant problems. A modest percentage of Port Wine Stains located over the eye and central forehead can be associated with glaucoma and/or problems in the brain resulting in seizures or mental retardation. This association of facial PWS and glaucoma and/or seizures is called the Sturge-Weber Syndrome. Depending on the location and the extent of the PWS on one extremity can lead to enlargement of the extremity relative to an unaffected limb (Klippel-Trenaunay Syndrome).

What treatments are available for PWS?

Many forms of therapy have been used to treat PWS in the past. Most forms of therapy such as surgery radiation, X-ray, dry ice or tattooing have been abandoned because these treatments often leave deformities as undesirable as the PWS itself. The current "Gold Standard" of treatment is by one of several types of skin Laser systems.

What forms of Laser Therapy are available?

The Flashlamp-Pulsed Dye Laser (Candela) is the gold standard for PWS treatment and offers several distinctive advantages over other systems. It was specially designed for treatment of the PWS, and for other skin lesions with prominent red blood vessels. this Laser can often be used without anesthesia, has a very low risk of scarring, and is safe and effective for use in infants, children as well as adults. We have more than a decade of experience with four generations of pulsed dye Lasers. The current device - the Vbeam comes equipped with a synchronized dynamic cooling device to protect the skin surface so that higher energies can be delivered to the skin safely and also to minimize the pain with treatment. In addition, this Laser has the capacity to deliver longer pulses to allow the energy more effectively to heat and destroy larger vessel targets and also to treat the skin without bruising. The Vbeam has a slightly longer wavelength as well as larger spot sizes, which allow deeper Laser penetration and has higher energy fluences to more effectively destroy the vessel targets.

What conditions can be treated with the Dye Laser?

Besides the PWS the Dye Laser is very effective with other conditions with prominent red blood vessels such as dilated facial veins seen in facial rosacea. Spider veins of the face are effectively eradicated often with one treatment session. This Laser is useful to diffuse areas of redness on the face, such as in some types of Rosacea. In addition

the red discoloration and pigmentary abnormalities on the neck from sun-damage, known as Poikiloderma is also amenable to therapy. Unfortunately, the Dye Laser is not usually recommended as first line therapy for spider veins of the legs. Standard sclerotherapy in our office is usually a more cost-effective approach. However for some resistant small vessels which can not be treated by injection the VBeam Laser can effectively treat some selected leg vessels because of improved spot size, variable pulse widths, dynamic cooling, and higher attainable energy levels. The rapidly proliferative or enlarging Hemangioma or ulcerated Hemangioma birthmark in the infant and newborn are other conditions which are being shown to be effectively managed if treated early when the birthmark is still relatively flat. After the birthmark has regressed the VBeam Laser is a very effective modality to remove unwanted residual re blood vessels.

How does the Dye Laser work?

The Dye Laser generated a very powerful light that is yellow in color. It carries enormous energy which is briefly flashed in short pulses (slightly greater than a thousandth of a second) and is selectively absorbed by the red Hemoglobin pigment in red blood cells. This energy heats up the blood and the lining of the blood vessels, causing them to slowly and permanently seal shut. The selective absorption of this intensive finely pulsed yellow light by red lesions allows for selective injury to the blood vessels with very little change to the overlying skin. This makes the risk of scarring, skin texture, and color changes extremely small.

What happens during a treatment?

A brief, bright flash of light occurs and the skin site treated will immediately develop a purple spot 7-10mm (about 1/2inch) in diameter. The skin stings for 20 seconds as if you have been snapped by a rubber band, and then itches for 3 to 5 minutes. The purple spot lasts for 7-10 days and the treated spots become more red for 10 more days. At about one month, the treated site begins to fade and will continue to lighten for 2 to 3 months after which clearing can be seen and evaluated.

Once a decision to treat has been made, a small test site may be done to ascertain the optimal energy level to clear the lesion as well as patient tolerance of the treatment. Several small representative sites will be selected as well as various Laser energy levels. The patient will return at 2 to 3 months to evaluate the test areas and the optimal energy level is then selected and a laser area treated. In most cases (depending on the size of the lesion), the entire lesion can be treated at each visit. Most treatment sessions last 15-30 minutes which will usually be sufficient time to treat a palm sized area of greater depending on lesion location and patient cooperation.

When is the best time to treat a PWS?

The Dye Laser has been used safely in newborns, infants, children and adults. In general, the earlier the treatment of a PWS the better the results. Lesions that are pink, flat and blanchable respond the best. Lesions on the head, neck and proximal extremities tend to respond better than lesions near the hands and feet. Because the lesions is quite flat and superficial in infancy, they are ideally suited for treatment. In addition, since these lesions tend to expand in proportion to the child's growth, the smaller the lesion, the fewer pulses required to complete treatment.

How long will it take to complete treatment?

While the Pulsed Dye Laser is effective and safe, it will not remove the majority of PWS in one session. The darker and thicker the lesion, the slower the response and greater number of treatments necessary. Lesions over the temple and forehead respond better than on the cheek and around the lips. Lesions on the arms and legs respond the most slowly and incompletely. Generally speaking, most PWS may require 4 -7 or more repeat treatments to each area with 2 to 3 month intervals between each treatments. Large PWS could take a year to several years to remove completely. Patience with treatment is essential for best results.

What about pain and medications prior to and during the treatment?

While most adults and many children are able to tolerate the discomfort of treatment without any pain medication, some infants and children will require mild sedation or rarely a brief general anesthetic. We routinely use a topically applied local anesthetic cream called EMLA one to two hours before the scheduled treatment to decrease the discomfort associated with the procedure. You will be given a tube of this cream as well as instructions on its use after consultation in the office. Pain medication is available after treatment sessions as needed and desired. Dr. Goldberg is a Board Certified Pediatrician and Dermatologist, skilled in handling infants, children as well as adults. He will strive to tailor a treatment program with as little discomfort as possible and without incurring the added risk of general anesthesia whenever possible.

What are the potential complications of treatment?

The Pulsed Dye Laser is the safest modality for treatment of PWS. There is less than 1% risk of scarring and texture change with treatment. Dark skinned patients can absorb more of the Laser energy and will be at increased

risk for hypo-pigmentation of skin lightening after treatment. It is important to realize that the Laser may not completely eliminate the birthmark. At best, the Laser may cause a marked lightening after treatment. It is important to realize that the laser may not completely eliminate the birthmark. At best, the Laser may cause a marked lightening or change the birthmark from dark red to light pink, making it easier to cover with a more normal light make-up. It is also impossible to predict what long-term undesirable or unknown side effects could occur as a result of this Laser treatment since it has been in use since the mid 80's. We are also not completely certain if a treated lesion might not possibly partially return after many years following treatment.

What precautions need to be taken before and after treatment?

It is essential that the skin over the PWS to be treated be as pale as possible prior to treatment. Broad-spectrum Sunscreens (SPF 30 or higher) need to be applied routinely before and after therapy. Postoperative care is simple and requires that you not rub or create any friction over the area. The treated area should be cleaned with gentle soap and water and the application of an antibacterial ointment such as Polysporin ointment two to three times daily for the first seven to ten days after therapy.

Does insurance pay for treatment?

We have had fairly extensive discussion with multiple insurance carriers and the majority do cover treatments in whole or part. Several managed care plans and HMO's do not cover treatment; however Medicare, Blue Cross/Blue Shield and Children's Rehabilitative Services are among some of the insurance carriers who do cover therapy. Our Insurance Coordinator and Dr. Goldberg will work with you and help you obtain whatever benefits you are entitled to under your insurance plan. It is important that photographs of how the PWS has changed over time be available to send into the insurance company, and it is advisable that whenever applicable, you obtain recertification for tests and regular treatments prior to the initiation of treatment.

What are you the costs of treatment?

The Laser technology is moderately expensive. The physician fee varies depending on the time spent, number of pulses of Laser used, the area treated as well as the location and difficulty of the procedure.

If I choose not to have treatment, what can I do to cover my PWS?

There are a number of excellent products available to cover-up PWS lesions, such as Covermark and Dermablend.

Is there a support group for people like myself with a PWS?

Yes! There is a national organization called the Sturge-Weber Foundation. You can reach them at P.O. Box 460931, Aurora, Colorado, 80046, or by phone at 1-303-360-7290. They are also located on the web at www.sturge-weber.com. This organization puts out a newsletter and can be contacted for further information.

We also have a local PWS support group in Tucson. Please contact Mr. Kit Causey at the Square and Compass Clinic at 324-3040 or our office if you are interested in participating in a support group, or speaking to someone else with your condition.