Vascular Lesions

Neil S. Sadick, MD; Nils Krueger, PhD

Vascular lesions, similar to varicose veins, telangiectases, rosacea, hemangiomas, and port-wine stains, are common and can affect up to 5% of the adult population. Although they typically are not painful, vascular lesions can have a great impact on the patient's quality of life. Leg lesions can cause symptoms such as aching, discomfort, and muscle cramps that primarily affect a patient's health-related quality of life, while facial lesions often lead to psychologic discomfort and feelings of embarrassment, anxiety, low self-esteem, and antisocial behavior. From this perspective, it is apparent that the treatment of vascular lesions is more than just a cosmetic concern; it also has a high degree of medical relevance.

Over the years, treatment of vascular lesions has substantially changed, and less invasive therapies with improved results have evolved. These advancements allow for safer, more effective treatments and increase the level of comfort for patients and physicians. Endovenous laser therapy, or radiofrequency ablation, has become an important therapeutic option for axial leg veins. This technique is relatively painless and has a high long-term success rate. For superficial lesions, lasers have become first-line therapy, as they specifically target the natural absorption peaks of oxyhemoglobin and deoxyhemoglobin to create thermal energy. The selective endogenous destruction is associated with only minimal damage to surrounding tissues and allows for the treatment of superficial vascular lesions without scarring.

Recently approved by the US Food and Drug Administration for uncomplicated spider veins and reticular veins in the lower extremity, an example of steady evolution in the field of phlebology is the sclerosant polidocanol, a mixture of ethers, macrogols, and fatty alcohols that induces endothelial damage through multiple mechanisms. Its clinical efficacy is equivalent to sodium tetradecyl sulfate (STS) but with less severe adverse effects.[1] A pivotal study by Rabe et al[2] demonstrated higher treatment success rates and statistical superiority in patient satisfaction with polidocanol versus STS and isotonic saline. The incidence of side effects was generally lower in patients treated with polidocanol than in those treated with STS.[2] An experimental study has shown that polidocanol has a much lower probability of developing tissue necrosis than any other sclerosant.[3] Furthermore, due to its anesthetic effect, it does not cause pain.[4]

Another example of continued development in the treatment of vascular lesions is a new external laser system that has been adjusted to the needs of phlebologists by combining a 532-nm potassium-titanyl-phosphate laser and a 1064-nm Nd:YAG laser with short- and long-pulse modes in one device. The 532-nm wavelength with short pulses has been shown to be ideal for the treatment of superficial vascular conditions such as telangiectasia and rosacea, and the 1064-nm wavelength with longer pulses is effective for treating deeper vascular conditions.[5,6] This combination of different technologies in one device not only makes treatment more comfortable but also reduces the cost, thereby increasing the availability of optimal treatment options for a wide range of patients with vascular lesions.

An interesting discovery in the treatment of vascular lesions is the use of the beta-blocker propranolol to treat problematic infantile hemangiomas. Although most patients can be managed conservatively, intervention is necessary when the patient's life or functionality are affected. Recent reviews show that the treatment of infantile hemangiomas with an applied oral dose of 1 to 3 mg/kg per day of propranolol is highly effective. Side effects such as hypotension or sleep disturbance are common but not serious enough to warrant stopping or amending the dose.[7,8] A pilot study by Kunzi-Rapp[9] also showed good results for topically applied propranolol. The sum of its efficacy and safety make propranolol the new first-line therapy for problematic infantile hemangiomas.

More frequent use of long pulsed dye lasers (PDLs) for the treatment of vascular lesions is another important development. Although short-pulsed PDL is known to create cosmetically unacceptable purpura due to photoacoustic shattering of capillary walls, PDL with longer pulse durations applies the heat to blood vessels more slowly, thereby eliminating the photoacoustic effects

Dr. Sadick is from Sadick Dermatology, New York, New York, and Weill Cornell Medical College, New York. Dr. Krueger is from the University of Hamburg, Division of Cosmetic Science, Germany. Dr. Sadick has received research grants from Cutera, Inc, and is a consultant for Merz Aesthetics, Inc. Dr. Krueger reports no conflicts of interest in relation to this article.

and avoiding the formation of purpura while maintaining clinical efficacy.[10] The more recently developed PDL devices also utilize a novel pulse structure through which each macropulse is subdivided into 6 to 8 micropulses. With these evenly spaced micropulses, a greater total fluence can be delivered more gently to the tissue in single-pass treatments.[11] Often, these new PDL devices also use larger spot sizes and longer wavelengths (590, 595, and 600 nm) to enable deeper penetration.

These innovations are only a few examples of the steady progress that continues to be made in research on the treatment of vascular lesions. They show how treatment approaches for every vascular indication have consistently improved to make the treatment safer, more efficient, and more comfortable for the patient as well as the physician. As we increase our understanding of the current scientific knowledge on vascular lesions, we will be able to help improve the quality of life of our patients who are affected by vascular lesions.

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