Management of Cosmetically Objectionable Periocular Veins

Robert C. Kersten, M.D.¹

ABSTRACT

Cosmetically objectionable reticular veins in the eyelids may be managed by transection and cautery, extraction with a special phlebectomy hook, laser ablation with the neodymium-doped yttrium aluminum garnet laser, or sclerotherapy using sodium tetradecyl sulfate.

KEYWORDS: Eyelid veins, periocular reticular veins, sclerotherapy, Nd:YAG laser ablation

Patients who desire cosmetic improvement of the face may request the elimination of visible periocular veins. These occur most frequently in the lower eyelids toward the lateral portion of the orbit. Veins around the eyelids are oftentimes more visible because there is no subcutaneous fat beneath the very thin periocular eyelid skin. They may also be more apparent in individuals with fair complexions or in older patients with further loss of subcutaneous tissue due to aging. The veins are typically asymptomatic, and most patients seek treatment to eliminate the appearance of these dilated, protruding, subcutaneous veins, which are similar to blue reticular veins of the leg. Treatment usually consists of methods to transect or surgically remove the vein or to eliminate it through the use of injectable sclerotherapy or laser ablation.¹

SURGICAL REMOVAL OR TRANSECTION

Elimination of periocular veins can be achieved with several techniques by either transecting the vein through several small overlying cutaneous incisions or extraction with a phlebectomy hook. Transection of the vein(s) is my preference. This can be done in an ambulatory setting where unipolar or bipolar cautery is available.

The skin is cleaned and a skin marking pen is used to outline the course of the vein. Several 3- to 4-mm incisions are marked transversely over the course of the vein spaced at ~1-cm intervals. The skin is prepped with povidone iodine solution, and a small bleb of local anesthetic is then injected over each of the incision sites. The visible periocular veins may be single or multiple, and anywhere from three to six incisions are usually required. A no. 75 eye-knife is generally used to make these fine incisions as a no. 15 Bard-Parker blade is usually larger than desired for these short transverse incisions. The veins lie immediately beneath the dermis on the surface of the underlying orbicularis oculi muscle, and the skin in this area is very thin. Once the incision is made, fine, single-prong skin hooks can be used to retract the skin and reveal the underlying vessel wall. The lumen is then obliterated either with bipolar cautery, using a jeweler's tip, or a unipolar cautery may be used to apply current to the vessel lumen by inserting a 25-gauge needle into the lumen and applying the unipolar tip to the needle. This process is begun at the lateral extent of the visible vein, and after cautery has been applied, one works medially to incise and transect the vein. A cotton-tipped applicator is used to milk the blood from the lumen prior to applying the cautery.

¹Department of Ophthalmology, University of Cincinnati Medical College, Cincinnati, Ohio.

Address for correspondence and reprint requests: Robert C. Kersten, M.D., Clinical Professor of Ophthalmology, Department of Ophthalmology, University of Cincinnati Medical College, 3219 Clifton Avenue, Suite 110, Cincinnati, OH 45220.

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Once the entire length of the visible vein has been emptied and cauterized, it is possible to visually confirm that the vein does not reperfuse. The skin incisions are closed usually with a single interrupted 7.0 Vicryl suture at each site.

When making the transverse skin incisions, one must customize the length to allow adequate visualization and application of cautery to the vein. Too short an incision makes this more difficult and increases the risk that electrical current may cause thermal damage to the adjacent dermis. When in doubt, it is best to lengthen the incision to allow adequate exposure of the vein as skin incisions heal imperceptibly in the fine periocular skin. If cautery does contact the margins of the wound, thermal injury to the dermis may result. Although the thermal injury of the dermis may result in greater initial scar erythema and hypertrophy in the immediate postoperative period, the ultimate scar is generally imperceptible.

An alternate surgical approach has been described by Weiss and Ramelet and utilizes a phlebectomy hook specifically designed for reticular veins.^{2,3} I have no experience with this technique, but it similarly involves marking out the course of the vein and injecting local anesthetic in the midpoint of the length of the vein to be removed. The authors describe introducing an 18-gauge needle in the center of the targeted length of the vein, and a specialized phlebectomy hook of their design is introduced. The stem of the phlebectomy hook is used to undermine the vein on either side of the puncture wound, and a specialized harpoon of the hook is used to grasp the vein once it has been freed up; then it can be distracted and removed with the help of a mosquito clamp. Compression over the puncture site is then maintained for 10 minutes time to minimize hematoma. The 18-gauge puncture site is not sutured closed. The authors reported success in 10 consecutive patients, and in 8 of 10, complete elimination with a single procedure was satisfactory. Two patients required a second procedure because of incomplete removal of the cosmetically visible vein. Reoperation 2 months later in both of these cases was reported to be successful. Two patients developed a minor hematoma, which resorbed.

SCLEROTHERAPY

Sclerotherapy using a 0.75% solution of sodium tetradecyl sulfate has been used for decades to eradicate varicose veins on the lower extremities. It has also been used to eradicate prominent veins at other cutaneous sites including the face.^{4,5} There has, however, been general reluctance to use sclerotherapy for removal of periocular veins because of fear of ophthalmologic and neurological complications.

Recently, Green⁶ presented a series of 50 adult female patients who underwent successful sclerosing of

visible periocular veins without experiencing ophthalmologic or neurological sequelae. The recommended technique uses sodium tetradecyl sulfate, a Food and Drug Administration–approved sclerosing agent, in a concentration of 0.75%. A 3-mL syringe is used with a 30-gauge needle. No local anesthesia is required. The vein is cannulated with the 30-gauge needle, and this is confirmed by retrograde flow of blood into the needle hub. Tetradecyl sodium is then slowly injected using minimal pressure. The needle is directed laterally so that the flow of the sclerosing agent is directed away from the midface. The colorless sclerosing agent's course in the vein is apparent as it displaces intraluminal blood. A total of 1 to 3 mL of sclerosant is infused into each of the puncture sites. Multiple punctures may be necessary for longer veins. The end point is when the venous blood has been completely displaced by the sclerosant agent. The author reported the use of between 2 and 6 mm of sclerosant in each case, and only unilateral treatment is performed at one session because of the theoretical risk of neurological or ophthalmologic sequelae. Immediately after slow infusion of the solution, a gauze pad is placed over the length of the treated vein and digital pressure is maintained for 1 minute. Following this, the vein is examined and the clinical end point of treatment is the cessation of any blood through the targeted vessel. The sclerosing agent usually induces linear erythema and edema in the skin along the course of the vein, which is usually apparent within minutes of injection and persists for ~30 minutes. The vein is examined at 1 minute after treatment, and if blood can still be displaced from the vein by digital pressure that returns upon release of the pressure, the procedure is immediately repeated by recannulating the vein and injecting additional solution. Mild erythema and edema along the course of the treated vein persists for 2 to 7 days. The author reported that minimal tenderness was experienced by some patients and persisted for a few hours to several days. The author reported at 1 week follow-up that there were no patent veins in which blood could be displaced. However, in some patients a thin cord at the site of the previous vein could be palpated, which is felt to represent the denatured thrombosed vein. In all such cases a visual or palpable residua had disappeared within 2 months after treatment.

NEODYMIUM-DOPED YTTRIUM ALUMINUM GARNET LASER ABLATION

Laser treatment of facial telangiectasia has been reported with a variety of laser systems including the 532-nm diode, potassium titanyl phosphate (KTP), double-frequency neodymium-doped yttrium aluminum garnet (Nd:YAG) lasers, and newer pulsed dye lasers (585- to 600-nm range). These lasers have all been successful for treatment of small facial telangiectasia in vessels but have

been disappointing in the treatment of larger facial veins. More recently, however, the use of cryogen spray variable pulse width 1064-nm Nd:YAG laser has been reported to result in excellent improvement in eight patients with periorbital reticular veins.⁷ Veins in these patients measured from 1 to 2 mm. Treatment of the reticular veins requires 150 J/cm² using a 6-mm spot size and 50- to 100-ms pulse width. Cryogen spray was used in post-laser cooling. Treatment goals were to achieve blanching without causing a cutaneous burn. One to two passes were performed in these patients using multiple shots in nonadjacent order to prevent excessive heat accumulation. Protective eye wear was required for these patients. At 1 month follow-up, 100% of the eight patients with reticular periorbital veins showed resolution of the vessels. The authors found that pain may require local anesthetic infiltration in some patients. Erythema and mild edema of the overlying skin was found in all patients who were treated. Fine crusting of the skin was reported in several patients, which subsequently cleared. Small purpuric spots were noted in several patients immediately after treatment but resolved within 1 week.

The goal of treatment is to damage the vein without causing overlying cutaneous scarring. Type IV patients are said to require more of the dynamic cooling device spray before and after treatment. Postinflammatory hyperpigmentation was not noted in any of the patients treated in the study.

Direct surgical transection or excision of veins, sclerotherapy with 0.75% Sotradecol, or laser treatment with the 1064-nm Nd:YAG laser all appear to be an effective means of eliminating cosmetically objectionable reticular veins in the periorbital region. The number of patients reported in the literature remains small for any

of these therapies. Residual concern with sclerotherapy in the periorcular remains. Although there were no problems in the 50 patients reported by Green, sclerotherapy for arterial venous malformations extending into the orbit have resulted in ocular morbidity. (Inadvertent vascular infusion of the sclerotherapy agent is also a concern as this may result in cutaneous ulceration.) The facial veins have valvular anastomosis, which may extend to the orbit and cavernous sinus. Blindness has been reported following a sclerosing injection into a venous malformation partially located in the orbit.⁸

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