CME

Xanthelasma Palpebrarum: A Review and Current Management Principles

Rod J. Rohrich, M.D., Jeffrey E. Janis, M.D., and Patrick H. Pownell, M.D.

Dallas, Texas

Learning Objectives: After studying this article, the participant should be able to: 1. Describe the differential diagnosis of xanthelasma palpebrarum. 2. Discuss the various nonsurgical and surgical treatment options and their advantages and disadvantages. 3. Describe the circumstances in which recurrence is most likely after treatment.

Xanthelasma palpebrarum is the most common cutaneous xanthoma. It typically presents in middle-aged and older adults, most often around the eyelids. The diagnosis can often be made on clinical grounds alone. For the plastic surgeon, it is important to apply an algorithmic approach to the treatment of these lesions. Depending on the size and location, several different methods can be used to address this problem, ranging from simple excision, to laser treatment, to chemical peeling. This article addresses the underlying pathophysiology of xanthelasma and the currently accepted modes of treatment. (*Plast. Reconstr. Surg.* 110: 1310, 2002.)

Xanthomatous lesions are characterized by the presence of fibroproliferative connective tissue with associated lipid-laden histiocytes, also known as foam cells because of the histologic appearance of their cytoplasm. Xanthelasma palpebrarum is the most common cutaneous xanthoma.[1] The typical lesions appear as soft, yellow plaques on the medial aspect of the eyelids. The fatty deposits may also take on a darker red or brown appearance and can vary in texture and firmness. This disorder typically presents in middle-aged and older adults, with an incidence of 1.1 percent in women and 0.3 percent in men.[2] The diagnosis can often be made on clinical grounds alone.

Clinical Significance

Xanthelasma may be an important marker of underlying disease. Hyperlipidemia is reported to occur in approximately 50 percent of patients with xanthelasma. Screening is recommended.[3,4] The most often associated familial dyslipoproteinemia is type IIa, although type IIb and even type III can also be found.[5,6] Extensor tendon xanthomas and a corneal arcus are also typically associated with xanthelasma[7] and are always a sign of hyperlipoproteinemia in children.[8] The appearance of xanthelasma before age 40 may be associated with an increased likelihood of familial hypercholesterolemia.[9]

The differential diagnosis of typical lesions includes cirrhosis, hypothyroidism, and nephrotic syndrome. Atypical lesions may present in the setting of Erdheim-Chester disease, a systemic xanthogranulomatous disorder that displays more indurated-type lesions. Similar lesions may also be found in lipoid proteinosis, a rare autosomal recessive disorder characterized by the perivascular deposition of hyaline material. These lesions usually appear as a string of nodules along the lid margin and also affect other cutaneous sites and mucous membranes. Histologic examination may be necessary to make an accurate diagnosis.

Histology

Microscopically, xanthelasmas are composed of xanthoma cells, which are foamy, lipid-laden histiocytes. These tend to be found in the superficial dermis in perivascular and periadnexal locations, often with associated surrounding fibrosis and inflammation.

From the Department of Plastic Surgery, University of Texas Southwestern Medical Center. Received for publication February 5, 2002.

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TREATMENT

There are no recognized complications of xanthelasma, and only rarely do they become large enough to obstruct vision[10]; however, they do pose a problem of cosmetic importance. It has yet to be definitively proven that dietary restriction of fat causes regression of xanthelasma, as there are studies supporting both sides.[11,12] In some cases, treatment of the underlying medical disorder can cause regression, as in the case of thyroid hormone replacement therapy for hypothyroidism.[13] In general, treatment methods for xanthelasma include surgical excision, laser ablation, and topical trichloroacetic acid.

Surgical Excision

Zarem and Lorincz's[14] approach superficially excises xanthelasma lesions, although they also support light electrodesiccation and topical treatment with trichloroacetic acid. Le Roux[15] advocates a modified blepharoplasty incision approach with the upper incision curving upward on the lateral aspect and the lower incision taking a more inferolateral course than the classic incision. He contends that this modified approach encloses the medial canthal area, where xanthelasma are typically found, better than the classic incision. Furthermore, the approach can allow for greater excision of skin. Parkes and Waller[16] advocate using the classic blepharoplasty incision to excise xanthelasma and warn against extending the incision to include those lesions not included in the standard flap design. They support serial staged excisions that remove only one or two xanthelasma per procedure, with a minimum 2-month interval between procedures. For isolated xanthelasma, they promote *en toto* excision of soft or immature lesions in an elliptical fashion but support a different approach for long-standing, hard xanthelasma. In these cases, they describe the "uncapping" of the lesion, removal of the cholesterol deposit in one piece, and closure. Tension-free closure is, of course, paramount. Hosokawa et al.[17] described their technique of using orbicularis oculi musculocutaneous flaps to provide coverage after excision of large lesions while preserving upper-lid skin for reexcision in the case of recurrence.

Laser Ablation

The use of carbon dioxide, argon, erbium: yttrium-argon-garnet, and pulsed dye lasers has been described in the treatment of xan-

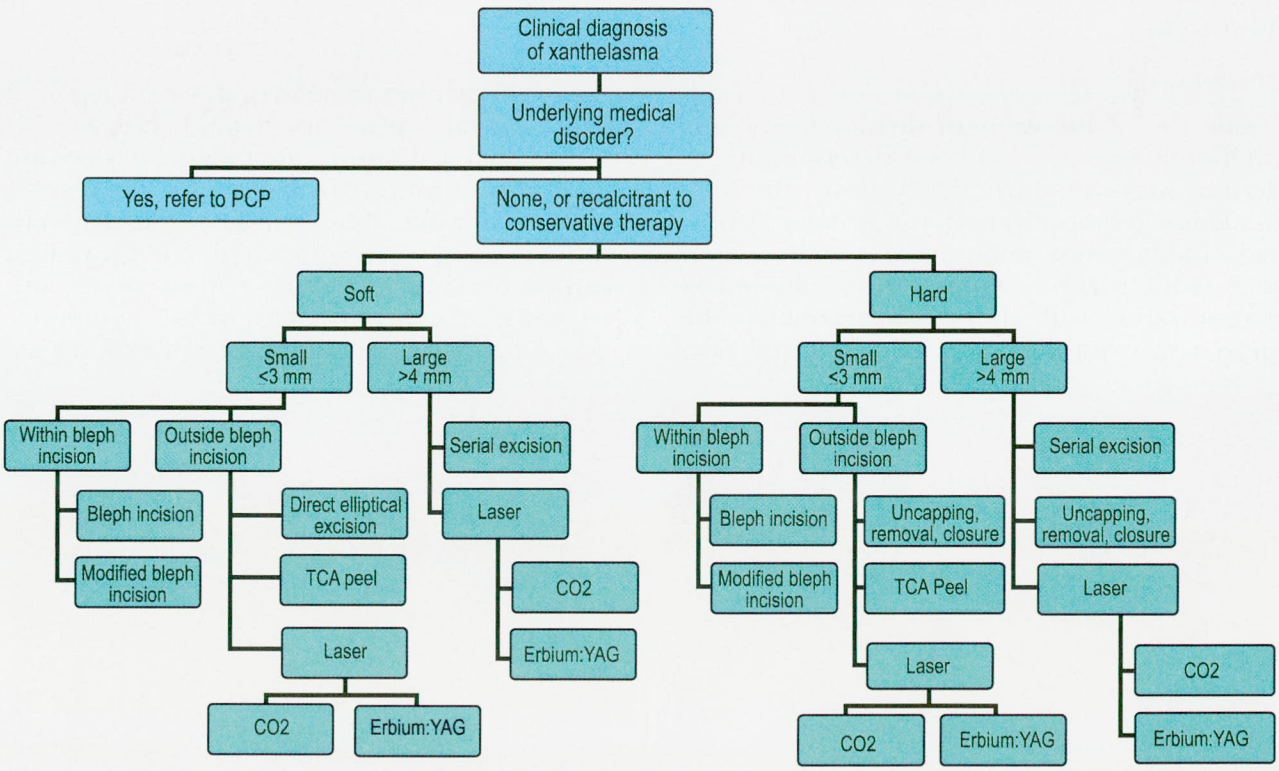

FIG. 1. An algorithmic approach to the treatment of xanthelasma.

thelasma. Recently, Raulin et al.[18] published their experience with the high-energy, pulsed carbon dioxide laser in the treatment of 23 patients. They effectively removed all xanthelasma in one treatment, with a 13 percent recurrence rate in 10 months. Transient adverse effects included hyperpigmentation in 4 percent and hypopigmentation in 13 percent, with no visible scarring. Alster and West[19] described their experience with high-energy, pulsed carbon dioxide laser ablation to treat xanthelasma and submitted two case reports of successful treatment after three or four passes with no recurrence at 8 and 12 months, respectively. Mannino et al.[20] described their experience in treating 30 patients with the erbium: yttrium-argon-garnet laser with effective removal of the lesions and no visible scarring or dyschromia. Lieb et al.[21] compared the carbon dioxide and the erbium:yttrium-argon-garnet lasers in eyelid surgery including xanthelasma removal and found that wound healing with the carbon dioxide laser was significantly slower because of its larger thermal necrosis zone. However, the carbon dioxide laser also provided better hemostasis and was therefore better suited for deeper lesions. The erbium:yttrium-argon-garnet laser gave excellent results in the treatment of superficial lesions, including those around the area of the lid margin.

Trichloroacetic Acid

The use of full-strength dichloroacetic and trichloroacetic acid has been described in the dermatology literature.[22,23] Typically, the technique involves application in a circular fashion with the greatest amount of trichloroacetic acid at the margin of the lesion, followed by neutralization with sodium bicarbonate. This approach is simple, straightforward, and non-surgical; however, scar formation and ectropion are issues when this technique is used on the lids.

Prognosis

Recurrence of xanthelasma is common, regardless of the mode of treatment. Mendelson and Masson[24] described the Mayo Clinic experience with a 40 percent recurrence rate after primary excision and a 60 percent recurrence rate after secondary excision. The highest incidence of recurrence was within the first year (26 percent). The same study described three circumstances in which surgical excision is unlikely to prevent reformation of lipid plaques:

1. cases with defined familial hyperlipoproteinemia
2. involvement of all four eyelids
3. more than one recurrence.

Algorithmic Approach to the Treatment of Xanthelasma

Based on the above discussion of the literature, we have developed an algorithmic approach to the treatment of xanthelasma lesions (Fig. 1) that takes into account the consistency, size, and location of the lesions. These criteria help to guide the appropriate therapeutic strategy.

Clinical Case Correlation

The 45-year-old white man shown in Figure 2 had a several-year history of xanthelasma of his bilateral medial canthal area but no underlying medical disorder. The patient had large (>4 mm) lesions that, despite their chronicity, were soft. He was treated with a high-energy, pulsed carbon dioxide laser using settings of 300 mJ, 60 watts, and density of 6, with a computer-generated 2-mm square scan pattern. Three

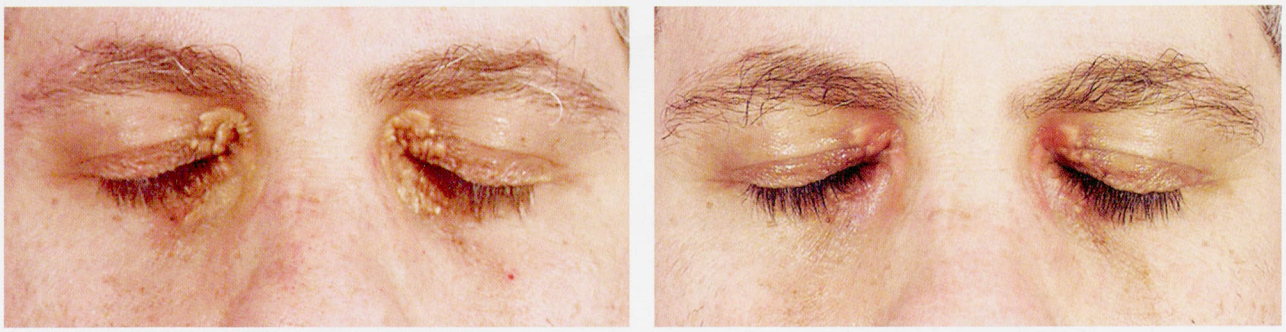

Fig. 2. A 45-year-old white man with a several-year history of xanthelasma of the bilateral medial canthal area was treated with a high-energy, pulsed carbon dioxide laser ablation by making three passes in each area (setting: 300 mJ, 60 watts, density of 6, with a computer-generated pattern of a 2-mm square scan). (*Left*) Preoperative view; (*right*) 6-week postoperative view.

passes were made in each area. Photographs are shown preoperatively and 6 weeks postoperatively (Fig. 2).

Rod J. Rohrich, M.D.
Department of Plastic Surgery
University of Texas Southwestern Medical Center
5323 Harry Hines Boulevard, E7.210
Dallas, Texas 75390-9132
rod.rohrich@utsouthwestern.edu

REFERENCES

1. Cohen, P. R. Xanthelasma palpebrarum. *J. Gt. Houst. Dent. Soc.* 67: 10, 1996.
2. Jonsson, A., and Sigfusson, N. Significance of xanthelasma palpebrarum in the normal population (Letter). *Lancet* 1: 372, 1976.
3. Goldstein, J. L., and Brown, M. S. Familial hypercholesterolemia. In J. B. Stanbury, J. B. Wyngaarden, and D. S. Frederickson (Eds.), *Metabolic Basis of Inherited Disease.* New York: McGraw-Hill, 1989.
4. Bergman, R. The pathogenesis and clinical significance of xanthelasma palpebrarum. *J. Am. Acad. Dermatol.* 30: 236, 1994.
5. Havel, R. J., and Kane, J. P. Introduction: Structure and metabolism of plasma lipoproteins. In J. B. Stanbury, J. B. Wyngaarden, and D. S. Frederickson (Eds.), *Metabolic Basis of Inherited Disease.* New York: McGraw-Hill, 1989.
6. Alexander, L. J. Ocular signs and symptoms of altered blood lipids. *J. Am. Optom. Assoc.* 54: 123, 1983.
7. Cruz, P. D., Jr., East, C., and Bergstresser, P. R. Dermal, subcutaneous, and tendon xanthomas: Diagnostic markers for specific lipoprotein disorders. *J. Am. Acad. Dermatol.* 19: 95, 1988.
8. Fredrickson, D. S. Plasma lipid abnormalities in cutaneous and subcutaneous xanthoma. In T. B. Fitzpatrick (Ed.), *Dermatology in General Medicine.* New York: McGraw-Hill, 1971.
9. Havel, R. J., and Kane, J. P. Introduction: Structure and metabolism of plasma lipoproteins. In J. B. Stanbury, J. B. Wyngaarden, and D. S. Frederickson (Eds.), *Metabolic Basis of Inherited Disease.* New York: McGraw-Hill, 1989.
10. Pedace, F. J., and Winkelmann, R. K. Xanthelasma palpebrarum. *J.A.M.A.* 193: 893, 1965.
11. Walker, E. E., and Musselman, M. M. Xanthomas at sites of infection and trauma. *Arch. Surg.* 94: 39, 1967.
12. Vinger, P. F., and Sachs, B. A. Ocular manifestations of hyperlipoproteinemia. *Am. J. Ophthalmol.* 70: 563, 1970.
13. Kaplan, R. M., and Curtis, A. C. Xanthoma of the skin. *J.A.M.A.* 176: 859, 1961.
14. Zarem, H. A., and Lorincz, A. L. Benign growths and generalized skin disorders. In W. C. Grabb and J. W. Smith (Eds.), *Plastic Surgery: A Concise Guide to Clinical Practice,* 2nd Ed. Boston: Little, Brown, 1973.
15. le Roux, P. Modified blepharoplasty incisions: Their use in xanthelasma. *Br. J. Plast. Surg.* 30: 81, 1977.
16. Parkes, M. L., and Waller, T. S. Xanthelasma palpebrarum. *Laryngoscope* 94: 1238, 1984.
17. Hosokawa, K., Susuki, T., Kikui, T. A., and Tahara, S. Treatment of large xanthomas by the use of blepharoplasty island musculocutaneous flaps. *Ann. Plast. Surg.* 18: 238, 1987.
18. Raulin, C., Schoenermark, M. P., Werner, S., and Greve, B. Xanthelasma palpebrarum: Treatment with the ultrapulsed CO_2 laser. *Lasers Surg. Med.* 24: 122, 1999.
19. Alster, T. S., and West, T. B. Ultrapulse CO_2 laser ablation of xanthelasma. *J. Am. Acad. Dermatol.* 34: 848, 1996.
20. Mannino, G., Papale, A., De Bella, F., Mollo, R., Morgia, P., and Gabrieli, C. B. Use of erbium:YAG laser in the treatment of palpebral xanthelasmas. *Ophthalmic Surg. Lasers* 32: 129, 2001.
21. Lieb, W. E., Klink, T., and Munnich, S. CO_2 and erbium: YAG laser in eyelid surgery: A comparison [in German]. *Ophthalmologe* 97: 835, 2000.
22. Haygood, L. J., Bennett, J. D., and Brodell, R. T. Treatment of xanthelasma palpebrarum with bichloracetic acid. *Dermatol. Surg.* 24: 1027, 1998.
23. Jansen, G. T. Little tips with big rewards. *J. Dermatol. Surg.* 2: 243, 1976.
24. Mendelson, B. C., and Masson, J. K. Xanthelasma: Follow-up on results after surgical excision. *Plast. Reconstr. Surg.* 58: 535, 1976.

Self-Assessment Examination follows on the next page.