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Treatment of Xanthelasma Palpebrarum with Bichloracetic Acid

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ROBERT T. BRODELL, MD

BACKGROUND. *Although many treatment modalities have been described for xanthelasma palpebrarum, no single technique has emerged as dominant.*

OBJECTIVES. *Our purpose was to review the various therapeutic modalities for xanthelasma and to assess the efficacy of topical bichloracetic acid.*

METHODS. *Thirteen patients with 25 xanthelasma were treated with topical 100% bichloracetic acid. Efficacy was assessed over a follow-up period of 7 months to 10.5 years (average, 64 months).*

RESULTS. *Eighty-five percent of patients experienced initial complete clearing, and 72% of their lesions have not required retreatment over an average period of 68 months. Recurrences responded well to repeat treatment. Eighty-three percent of recurrent or poorly responsive lesions were associated with high cholesterol. The most resistant patient had four-lid involvement. Excellent cosmetic results and high patient satisfaction were seen.*

CONCLUSIONS. *Topical bichloracetic acid is a viable alternative to other modalities in the management of xanthelasma. Advantages include simplicity, cost-effectiveness, speed, safety, and efficacy.**Dermatol Surg 1998;24:1027–1031.*

Xanthelasma palpebrarum is the most common cutaneous xanthoma. The term is derived from the Greek *xanthos* (yellow) and *elasma* (beaten metal plate). Clinically, xanthelasma are yellow plaques that occur most commonly near the inner canthus of the eyelid, more often on the upper than lower lid.[1] They can be soft, semisolid, or calcareous.[2] Frequently symmetrical, often four lids are involved. Xanthelasma have a tendency to progress, coalesce, and become permanent in nature.[1] Histologically, xanthelasma are composed of "xanthoma cells." These are foamy histiocytes laden with intracellular fat deposits primarily within the upper reticular dermis.[1,2] Half of these lesions are associated with elevated plasma lipid levels.[1] Some occur with altered lipoprotein composition or structure such as lowered HDL levels.[3,4] These lesions have no premalignant potential. The prevalence is roughly 1.1% in women and 0.3% in men, and increases with age.[5] Treatment options include surgical and nonsurgical modalities. We report a case series of 13 patients with xanthelasma and the results of treatment with 100% bichloracetic acid (BCA).

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Materials and Methods

This study is a descriptive case series report of our observations using bichloracetic acid for the treatment of xanthelasma. Photographs of the xanthelasma were taken prior to the initiation of treatment. The 100% BCA preparation was obtained from T. E. Watson Co., Kahlenberg Laboratories Division (Sarasota, FL). The acid was carefully applied with a pointed wooden applicator stick to the lesion, which became frosted white within seconds. Less than 0.01 mL was used in any treatment. Care was taken to avoid contact with the nearby uninvolved skin or accidental instillation into the eye. Patients were warned that they might experience a mild stinging sensation following application lasting up to 48 hours. It was not necessary to neutralize the acid after application. Polysporin ophthalmic ointment was applied twice daily during healing. Follow-up was made at 1 and 4 weeks. All lesions crusted and healed with only mild residual erythema at 1 month, fading progressively over several weeks. A recall follow-up appointment was made to determine the frequency of recurrent xanthelasma. Photographs were obtained at each follow-up visit.

The treatment of each lesion was rated as either excellent healing with no recurrence, incomplete resolution with part of the lesion remaining, recurrence, or no change. Patients with incomplete resolution or with recurrence were retreated until the lesion resolved to the patient's satisfaction. Photographs were reviewed by each of us to assess the degree of improvement. Patients were asked to assess their level of satisfaction as well.

Results

In our study 13 sequential patients seen with xanthelasma were selected for treatment. (Table 1) There were five men and eight women with an average age of

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Table 1. Treatment Outcomes with 100% BCA in 13 Xanthelasma Patients

Patient	Age (yrs)	Gender	Cholesterol	No. of Lesions	Location	Response after First Rx	Recurrence	Response after Second Rx	Recurrence
A	55	M	nl	3	LUL, LLL, RLL	C	NO (>126 mo)		
B	45	M	nl	2	LUL, RUL	C	NO (>36 mo)†		
C	62	M	nl	2	LUL, RUL	C	NO (>13 mo)‡		
D	60	M	+	1	LLL	C	NO (>85 mo)		
E	64	F	+	1	LUL	C	NO (>84 mo)		
F	58	F	+	2	LUL, RUL	C	NO (>75 mo)		
G	52	F	+	1	LUL	C	NO (>53 mo)		
H	55	F	nl	2	LUL	C	NO (>42 mo)		
H	55	F	nl	2	RUL	C	12 MO	C	NO (>78 mo)
I	54	M	nl	1	LUL	C	9 MO	C	NO (>26 mo)§
J	63	F	+	2	LUL, RUL*	C	15 MO	C	NO (>68 mo)
K	47	F	+	1	LLL	C	10 MO	C	NO (>76 mo)
L	45	F	+	2	LUL, RUL	I	7 MO	LTFU	
M	54	F	+	5	LUL(2), LLL, RUL, RLL	I	64 MO	I‖	3 mo

Age given is at time of presentation. nl, normal; +, high cholesterol; LUL, left upper lid; LLL, left lower lid; RUL, right upper lid; RLL, right lower lid; C, complete clearing; I, incomplete response; LTFU, lost to follow-up.

* *Both recurrent after surgical excision 25 years earlier.*

† *Complete response with mild hypopigmentation at treated sites.*

‡ *Cleared completely after "touch up" treatment at 2 months.*

§ *A new lesion noted at LLL distant from past treatment site.*

‖ *Flattened with persistent yellowing.*

55 years at time of presentation. Eight patients (62%) had elevated lipid levels. All patients were Caucasian. One patient had been treated 25 years earlier with surgical excision and presented to the dermatologist for recurrence of her two lesions. No subjects had undergone previous treatment with BCA.

Twenty-five individual facial lesions were treated (Figure 1). An average of 1.9 xanthelasma per patient (range, 1–5; median, 2) was seen. Seventy-six percent of lesions occurred on the upper lids. The largest individual xanthelasma treated was approximately 2 cm^2. All lesions immediately frosted, became eroded within 24 hours, crusted, and healed within 2 weeks (Figure 2).

With initial treatment, 10 patients (16 lesions) experienced complete clearing. One other patient (two lesions) had a near complete response and cleared completely with a touch-up treatment 2 months later. Thus, overall 85% of patients (72% of lesions) showed initial complete clearing. The remaining two patients showed an incomplete response to initial treatment, one having presented with two lesions and the other with four-lid involvement and five lesions. The subject with four-lid involvement experienced flattening of the lesions, yet had persistent yellowing. Both incomplete responders had elevated cholesterol levels.

Figure 1. *Untreated xanthelasma (patient C).*

Follow-up ranged from 7 months to 10.5 years (average, 64 months). Of the 18 lesions that cleared completely with initial therapy, 13 (72%) have required no further treatment over an average period of 68 months. The remaining five (28%) recurred over a 9–15-month period and were treated a second time. Second treatments were also given to the patient with four-lid involvement, who had shown partial response to initial treatment. The other patient who had responded only partially with two lesions was lost to follow-up after 7 months and thus was not treated a second time.

All five recurrent lesions cleared completely upon second treatment and have required no further treatment over an average of 63 months. The partial responder with persistent yellowing on four lids again showed a partial response to a second treatment 64 months later, although results were cosmetically quite acceptable and the patient was satisfied with her improvement.

In this case series, there were no infections, scars, or serious complications. Mild hypopigmentation at the treated sites of an isolated patient (two lesions) was noted on follow-up visit 36 months posttreatment, al-

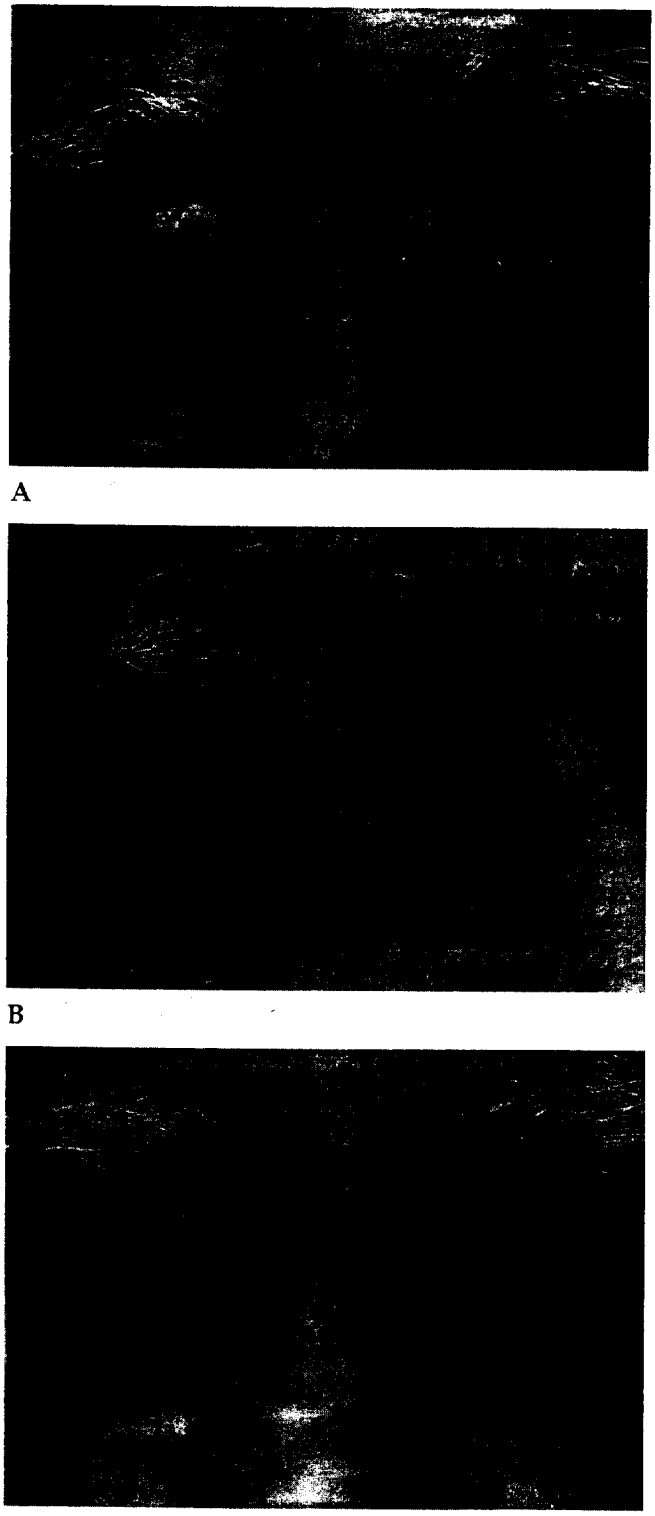

Figure 2. A) 30 seconds after BCA application (patient C); B) 1 week following treatment (patient C); C) 3 months following treatment (patient C).

though he considered this a definite cosmetic improvement over his xanthelasma. Patients tolerated the procedure well. High levels of satisfaction with the outcomes were reported by all subjects.

Discussion

Our results indicate that 85% of patients with xanthelasma treated with topical BCA responded initially, and of these, less than one-third recurred within 15 months. One hundred percent of recurrent lesions have responded well to a second treatment and have not required a third treatment over an extended follow-up period of up to 6.5 years (average, 63 months). Fifteen percent of our patients responded incompletely to initial treatment; in particular, the patient with four-lid involvement was consistently unresponsive.

The treatment of xanthelasma palpebrarum is performed primarily for cosmetic reasons, although lesions may be large enough to obstruct vision or become irritated. Spontaneous partial involution of xanthelasma occurs only rarely.[6] Although eruptive xanthomas clear considerably with diet and lipid-lowering agents and tuberous xanthomas may also regress with lowered serum lipoprotein levels, xanthelasma seldom resolve with diet or pharmacologic therapy.[7,8] Many surgical and nonsurgical treatment modalities have been described for xanthelasma, although no single technique has emerged as the dominant most effective method. Available options include surgical excision, electrodesiccation, cryotherapy, laser ablation, and chemical cauterization. The treatment of xanthelasma can be frustrating, as the lesions are prone to recur.[2] Regardless of the mode of treatment employed, recurrence rates approach 50%;[9] we observed a 28% recurrence rate with BCA in the current series.

Although cryotherapy uncommonly causes scarring, it may leave residual hypopigmentation. Electrodesiccation can destroy the xanthelasma plaques when they are superficial.[10] Both cryotherapy and electrodesiccation, however, often require repeated treatments.[11] To our knowledge, neither modality has been studied in a series of patients.

Although surgical excision can become time consuming and expensive, there is significant published experience and specific recommendations have been formulated. One of the more widely used techniques, surgical excision, has long been employed in the removal of xanthelasma.[2,9,11–18] Stegman[15] suggests that small linear lesions are best excised, as the scarring should blend in with the surrounding eyelid tissue. Rosenblatt[16] advocates the surgical approach for smaller bulging lesions that are "ripe" for removal. The hard, organized cholesterol deposit can be "uncapped" and removed, and then the flap replaced and sutured; a soft or immature lesion should be excised en toto via ellipse.[2]

While simple excision and closure may be readily accomplished for small isolated lesions, staged excision or removal of larger areas risks eyelid retraction, ectropion, or the need for more complicated coverage with

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grafts or other reconstructive procedures.[2,11–18] Upper eyelid fold asymmetry can be created with unilateral xanthelasma excision, sometimes necessitating surgery on the uninvolved side to recreate symmetry.[17] In full-thickness excision of involved skin, the lower lid is more prone to prominent scarring, as the tissue here tends to be thicker.[17] Xanthelasma removal has been incorporated into cosmetic blepharoplasty,[18–20] although Parkes et al[2] warn that extending the incisional limits of a routine blepharoplasty to include the lesion increases the risk for ectropion formation. These authors suggest serial staged excisions of no more than one or two lesions at a time with a lag time of no less than 2 months between procedures. A Mayo Clinic study[18] evaluated recurrence following xanthelasma excision. Forty percent of 92 patients had recurrent lesions after primary excision, and another 60% had recurrence after secondary excision. Twenty-six percent of recurrences occurred within 1 year. Factors associated with greatest risk of recurrence were young age, family history, four-lid involvement, underlying hyperlipemic syndrome, and a past history of recurrence. In the present series, we observed similar risk with four-lid involvement and to some degree with elevated cholesterol levels.

Carbon dioxide (CO_2) and other lasers also have been employed for xanthelasma removal.[9,11,12,17,21–25] Proponents of CO_2 laser ablation cite enhanced hemostasis with an essentially bloodless field and better visualization, as well as lack of suturing, less postoperative pain, and speed as advantages over traditional surgery.[17] A high rate of recurrence, however, has been associated with such therapy, usually within 1 year.[21] Scarring and pigmentary changes can occur after CO_2 laser vaporization.[11,17] If treatment extends deeper than the involved tissue, scarring is of greater risk.[9] The UltraPulse CO_2 laser has been used to enhance selectivity of tissue vaporization and minimize scarring.[21] CO_2 laser is not an ideal option, however, for the reasons of cost, risk of scar formation, and lack of availability in every office.

Chemical cauterization of benign lesions such as xanthelasma has been performed with agents such as trichloroacetic acid[2,9,11,15,17,26–29] or even Solcoderm, a complex of organic and inorganic acids with copper in solution.[30] Jansen[14] 20 years ago reported that he found di- or trichloroacetic (TCA) acid to be simpler than surgery in his practice and if properly used gave "superb resolution" of lesions, with results equal to or better than those of traditional excision. He found that after 6–8 weeks, if a small area of xanthelasma remained, "spot treatment" would readily remove the remaining lesion.

While there are very little data in the literature comparing the effects of the chlorinated acetic acids on skin, it is well established that all three acids, mono-, di-, and trichloroacetic, are effective tissue cauterants when used in high concentrations.[29] These agents precipitate and coagulate proteins and dissolve lipids, causing a nonspecific chemical injury to the skin.[26,29,31] However, the method by which BCA leads to destruction of xanthelasma with minimal scar formation is not well understood.[26] While the acid strength of these agents increases with each additional chlorine atom,[29] the degree of tissue destruction in practice likely varies more proportionately with the concentration of acid used than with the choice of acid.

Of the chloroacetic acids, monochloroacetic acid (MCA) is considered to be the most deeply destructive to tissues.[31] This may be due to its greater ability to penetrate membranes. Until recently MCA was available as a crystal or solution for the treatment of warts[31,32] (personal communication Gordon Labs, PA). Dichloroacetic acid (BCA) is typically used at full strength (100%) in its natural liquid state and has a broad range of indications, including xanthelasma, sebaceous hyperplasia, verrucae, hard and soft corns, seborrheic keratoses, ingrown nails, cysts, and benign erosions of the cervix.[33] Conversely, TCA, a crystalline solid at room temperature, is used in varying strengths, diluted to concentrations of 20–35% for superficial chemical peeling or 50% for deeper peeling.[28] TCA concentrations exceeding 50% can be used for destruction of discrete lesions such as external genital warts[33] or xanthelasma.[15,27–29] We know of no direct comparison between TCA and BCA for the treatment of xanthelasma.

In this series BCA therapy for xanthelasma has shown a 15% incomplete response rate and a 28% recurrence rate over an average period of 23 months. With longer follow-up, we might anticipate more recurrences in these patients. Retreatment with the same technique, however, has proven to be a simple, effective remedy for most of these recurrences, which tended to be smaller and less noticeable at the time of follow-up. Patient satisfaction with this modality was high in this series.

In summary, we have found BCA to be an excellent alternative to traditional surgery or laser in the treatment of xanthelasma. Patients should be informed that regardless of modality employed, recurrence is possible. Care must also be taken to avoid applying the acid to the surrounding uninvolved skin or accidental instillation into the eye. This technique offers the advantages of simplicity, cost-effectiveness, speed, safety, and efficacy. We believe that BCA may be an ideal treatment of xanthelasma, and we recommend it as a viable alternative to other modalities.

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