

Raimer's Bands: Case Report with a Review of Solar Elastosis

DUNCAN G. STANFORD¹, KATHERINE E. GEORGOURAS¹ and MURRAY KILLINGSWORTH²¹Dermatology Centre, Liverpool Hospital, and ²Electron Microscopy Unit, Lidcombe Hospital, Sydney, Australia

Raimer's solar elastotic bands of the forearm are a rarely described clinical variant of severe solar elastosis. We report a case of Raimer's bands on the forearm of a 43-year-old woman. Light microscopy demonstrated solar elastosis and electron microscopy revealed activated fibroblasts appearing to secrete the elastotic material. The clinical variants of solar elastosis are outlined and the possible pathogenesis of the elastotic material is discussed. Key words: actinic elastosis; fibroblast secretion.

(Accepted March 9, 1995.)

Acta Derm Venereol (Stockh) 1995; 75: 372-374.

D. G. Stanford, Dermatology Centre, Liverpool Hospital, 45-47 Goulburn St, Liverpool, 2170, N.S.W., Australia.

Solar elastosis represents a spectrum of clinically recognisable forms with a similar underlying histology, demonstrating elastotic material in the dermis (1). Primary forms result from chronic sun exposure (2) but secondary forms associated with heat (3) and chemicals (4) have been described. Primary solar elastosis in its simple form is characterized by yellow, inelastic, coarsely wrinkled and diffusely thickened skin (2). Several special forms have been recognised (5-18) (Table I), some having been described in Australia (1, 10, 12, 18) where solar elastosis is commonly seen amongst the fair-skinned population, particularly from middle-age onwards.

Raimer et al. (11) in 1986 described 3 patients with soft,

flesh-coloured to yellowish papules and nodules that tended to merge in a cord-like band extending from areas of severe actinic damage to less damaged areas of the forearm. The histology revealed a dermis containing haematoxylinophilic homogeneous material with clefting as well as fibroblasts and inflammatory cells. Electron microscopy showed abundant elastotic fibres composed of granular matrix and electron-dense condensations. Closely apposed to the elastotic fibres were fibroblasts rich in rough endoplasmic reticulum and histiocytes with multiple phagoliposomes.

We report a case of Raimer's plaques in a middle-aged woman and discuss the possible pathogenesis of solar elastosis in the light of the ultrastructural features of this case.

CASE REPORT

A 43-year-old Caucasian housewife of skin phototype II presented with a 2-month history of a linear lesion on the dorsum of her right forearm. A similar lesion was beginning on the dorsum of her left forearm. She had a history of atopic eczema since infancy that was controlled with topical corticosteroids, apart from a single admission with generalised erythroderma 6 years previously that necessitated oral corticosteroids. Her eczema typically flared in the summer months and this was complicated by poor compliance with topical sunscreens.

Slightly raised yellowish bands were evident on the dorsum of both forearms (Fig. 1). These extended along the interface of areas of severe and less severe actinic damage. Purpura had been noted on one occasion.

Table I. Specialized forms of primary solar elastosis, the main sites affected and distinguishing clinical features

Clinical form	Main site	Main features	Ref.
1. Cutis rhomboidalis nuchae	posterior neck	furrows	
2.a) Nodular elastoidosis b) Actinic comedonal plaque	a) periorbital; malar b) arms	a), b) plaques studded with cysts and comedones	(5, 6) (7)
3.a) Elastoma b) Nasal elastotic plaque	a) neck; anterior chest b) nasal dorsum	discrete focal plaques	(8)
4. Elastotic nodules of the ear	antihelix (helix)	discrete pale elevations	(9, 10)
5.a) Collagenous plaques of the hand b) Keratoelastoidalis marginalis	a) palm-dorsum junction b) radial index finger; lateral hand	a), b) discrete or confluent groups of hyperkeratotic papules	(11) (12)
6.a) Adult onset colloid milia b) Nodules & plaques of colloid degeneration	a), b) exposed sites	a) yellowish or translucent papules b) nodules of variable colour & consistency within erythematous plaques	(13) (14-17)
7. Actinic granuloma	exposed sites	red papules evolving into annular lesions with atrophic centres	(18)
8. Solar elastotic bands	forearm between actinically damaged and less damaged areas	flesh-coloured to yellowish papules & nodules merging into cordlike band	(11)
9. Unilateral facial plaque	cheek	indurated plaque; post-palpitory erythema	(1)

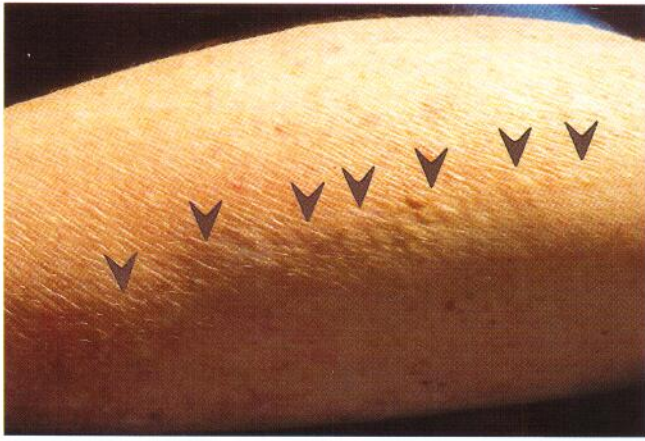


Fig. 1. Raised yellowish bands on the dorsum of the right forearm extending along the interface between areas of severe and less severe actinic damage (indicated by arrows).

Histology of a skin biopsy specimen revealed florid solar elastosis in the dermis and epidermal atrophy with effacement of the rete ridges (Fig. 2).

Electron microscopy showed moderately electron-dense masses in the mid-dermis. These had an amorphous and filamentous component at higher magnification. Fibroblasts were commonly seen and displayed abundant rough endoplasmic reticulum, mitochondria and a prominent Golgi apparatus. On one view small secretory-like vesicles were evident within a fibroblast, some of these opening along the cell membrane where it apposed the elastotic material (Fig. 3).

DISCUSSION

Solar elastotic bands of the forearm have only been described once before in the literature to our knowledge. The younger age of this patient in comparison to the 3 described by Raimer et al. (11) (63 to 83 years) may relate to her infrequent use of topical sunscreens, in addition to her fair skin and life-long residency in Australia. Epidermal atrophy, as seen in our patient and those of Raimer et al. (11), is indicative of end-stage photoageing (19), in keeping with the concept that this condition is a form of severe solar elastosis. Although Raimer et al. (11) described senile purpura in all their cases, prolonged topical corticosteroid use may have contributed to the purpura noted in our younger patient.

The pathogenesis of elastotic material in the dermis in solar elastosis remains controversial. Elastotic fibres are now known to originate from elastic fibres rather than collagen due to their staining with anti-elastin antibodies and disappearance with elastase but resistance to collagenase, in addition to the high desmosine content (2). It has been variously suggested that they may arise from elastic fibre degradation (2, 20) or de novo synthesis by sun-damaged fibroblasts (21, 22), or from both processes (23). There are two aspects of our case that favour the secretory origin theory: firstly, the presence of many activated fibroblasts and paucity of macrophages on light microscopy, and secondly, the electron microscopic picture of multiple secretory-like vesicles opening along the fibroblast membrane where it apposes the elastotic material.

In conclusion, solar elastosis comprises a spectrum of clinical forms that may arise due to the secretion of abnormal material

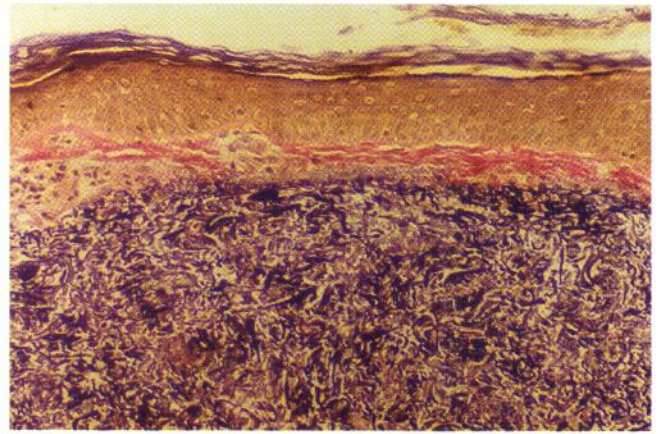


Fig. 2. Light microscopy showing florid solar elastosis in the dermis and epidermal atrophy with effacement of rete ridges (Verhoeff-van Gieson; $\times 62.5$).

into the dermis by sun-damaged fibroblasts. Raimer's bands of the forearm is a rare clinical form of severe solar elastosis.

ACKNOWLEDGEMENTS

The authors are indebted to Christina Cassidy of the Electron Micro-

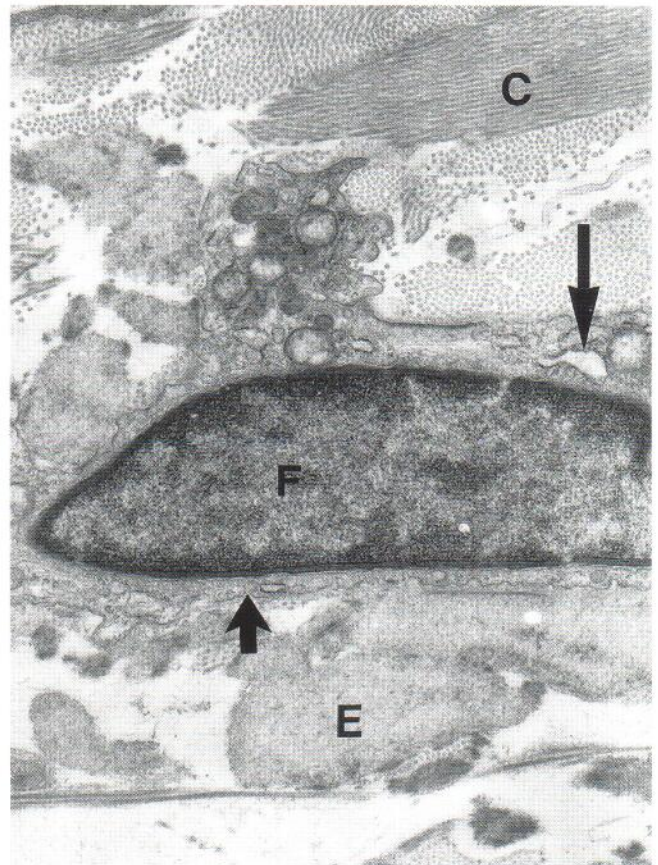


Fig. 3. Electron microscopy showing activated fibroblast (F) adjacent to elastotic material (E). Cytoplasm shows dilated rough endoplasmic reticulum (large arrow) and numerous secretory-like vesicles, some fused with the plasma membrane and containing amorphous material (small arrow). Normal collagen fibre also shown (C) ($\times 12,500$).

copy Unit at Lidcombe Hospital for preparation of the electron micrograph.

REFERENCES

1. Wittal RA, Georgouras KE, Baird PJ, Cleary EG, Henderson M. Unilateral facial actinic elastotic plaque: a new clinical variant of actinic elastosis. *Australas J Dermatol* 1989; 30: 15–22.
2. Burton JL. Disorders of connective tissue. In: Champion RH, Burton JL, Ebling FJG, eds. *Textbook of dermatology*. 5th edn. Oxford: Blackwell Scientific Publication, 1992: 1787–1789.
3. Finlayson GR, Sams WM, Smith JG. Erythema ab igne – a histopathological study. *J Invest Dermatol* 1966; 46: 104–108.
4. Findlay GH, Morrison JGL, Simson IW. Exogenous ochronosis and pigmented colloid milium from hydroquinone bleaching creams. *Br J Dermatol* 1975; 93: 613–622.
5. Cuce LC, Paschoal LHC, Curban GV. Cutaneous nodular elastoidosis with cysts and comedones. *Arch Dermatol* 1964; 89: 798–802.
6. Helm F. Nodular cutaneous elastosis with cysts and comedones (Favre-Racouchot syndrome). *Arch Dermatol* 1961; 84: 666–668.
7. Eastern JS, Martin S. Actinic comedonal plaque. *J Am Acad Dermatol* 1980; 3: 633–636.
8. Degos R, Touraine R, Civatte J, Belaich S. Elastome en nappe du nez. *Bull Soc Fr Dermatol Syphiligr* 1966; 73: 123–124.
9. Carter VH, Constantine VS, Poole WL. Elastotic nodules of the antihelix. *Arch Dermatol* 1969; 100: 282–285.
10. Weedon D. Elastotic nodules of the ear. *J Cutan Pathol* 1981; 8: 429–433.
11. Raimer SS, Sanchez RL, Hubler WR, Dodson RF. Solar elastotic bands of the forearm: an unusual clinical presentation of actinic elastosis. *J Am Acad Dermatol* 1986; 15: 650–656.
12. Koscard E. Keratoelastoidosis marginalis of the hands. *Dermatologica* 1964; 131: 169–175.
13. Holzberger PC. Concerning adult colloid milium. *Arch Dermatol* 1960; 82: 711–716.
14. Jager T. So-called colloid degeneration of the skin. *Arch Dermatol Syph* 1925; 12: 629–641.
15. Labadie JH. Colloid degeneration of the skin. *Arch Dermatol Syph* 1927; 16: 156–165.
16. Reuter MJ, Becker SW. Colloid degeneration (collagen degeneration) of the skin. *Arch Derm Syph* 1942; 46: 695–704.
17. Sullivan M, Ellis FA. Facial colloid degeneration in plaques. *Arch Dermatol* 1961; 84: 816–823.
18. O'Brien JP. Actinic granuloma. *Arch Dermatol* 1975; 111: 460–466.
19. Kligman AM, Kligman LH. Photoaging. In: Fitzpatrick TB, Eisen AZ, Wolff K, Freedberg IM, Austen KF, eds. *Dermatology in general medicine*. 4th edn. New York: McGraw-Hill Inc, 1993: 2972–2979.
20. Mitchell RE. Chronic solar dermatosis: a light and electronmicroscopic study of the dermis. *J Invest Dermatol* 1967; 48: 203–220.
21. Braun-Falco O. Die Morphogenese der senil-aktinische Elastose – eine elektronenmikroskopische Untersuchung. *Arch Klin Exp Dermatol* 1969; 235: 138–160.
22. Hashimoto K, Katzman RL, Kang AH, Kanzaki T. Electron microscopical and biochemical analysis of colloid milium. *Arch Dermatol* 1975; 111: 49–59.
23. Braverman IM, Fonferko E. Studies in cutaneous aging. I. The elastic fibre network. *J Invest Dermatol* 1982; 78: 434–443.