

CASE REPORT

Atopic Cataracts in a Child with Atopic Dermatitis: A Case Report and Review of the Literature

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Atopic dermatitis with cataract was firstly reported in 1914.¹ Since then keratoconjunctivitis, keratoconus, retinal detachment, and ocular herpes simplex have been described.

Lenticular opacity is an important ocular complication in adolescent and young adult patients with atopic dermatitis.^{2,3} The cause of atopic dermatitis and its ocular complications are unknown, but the cataract commonly occurs and progresses during periods of exacerbation of the dermatitis.

We currently had the opportunity to approach a case of atopic dermatitis associated with cataract (lenticular total opacity of both eyes). A male adolescent with atopic dermatitis abruptly developed cataracts after having suffered from severe skin itching for the previous 2 months.

CASE REPORT

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SUMMARY Cataracts induced by atopic dermatitis rarely occur in adolescent and young adult patients suffering from this problem. Lenticular opacity is an important ocular complication in atopic dermatitis. Although the cause of atopic dermatitis and its ocular complications are unknown, cataracts have been observed to develop and progress during periods of exacerbation of the dermatitis. We report the case of a 16-year-old boy with atopic dermatitis who abruptly developed cataracts in both eyes while suffering from severe skin itching which began 2 months before the initial examination. His peroxidation test result was very high, and we postulate the retinal peroxidation might play a key role in cataractogenesis. Lens aspiration and intraocular artificial lens implantation were performed smoothly with restoration of visual acuity in both eyes.

mitted to our hospital with the chief complaint of a sudden onset of blurred vision, which began 4 days before his admission. Skin itchiness had become aggravated over the face, trunk and four extremities 2 months prior to admission.

His history taken revealed skin allergy since infancy, and asthma was diagnosed when he was 3 years old. Recurrent eczema, pruritus, and scratching had been noted since infancy, and symptoms had occurred on and off after medication (eg. antihistamine). El-

evated serum total IgE level was also found. His skin lesion was characteristic with facial and extensor lichenified dermatitis. The skin lesion became generalized when he was 13 years old. No other members of his family has atopic dermatitis. Oral prednisolone was prescribed for only 3 days about 6 months prior to admission. Antihistamine (cyproheptadine, ketotifen)

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had been prescribed but the skin lesions still recurred frequently.

Physical examination revealed small patches of eczema, sparsely scattered, present on the face, trunk and dorsum of each hand. The lenses of both eyes were totally opaque (Fig.1). The entropion and multiple papillae on both conjunctivas were also found. The cornea of the left eye showed superficial punctate keratitis, which may have resulted from entropion trichiasis. The anterior chambers of the eyes were shallow and clear. Ophthalmologic sonography revealed no retinal detachment or vitreous hemorrhage.

A hemogram revealed hemoglobin of 13.4 g/dl, platelet 450,000/mm³, and WBC 12,800/mm³ (segment 66%, lymphocyte 26%, monocyte 8%). Blood urea nitrogen, creatinine, aspartate aminotransferase, alanine aminotransferase, sodium and potassium were normal.

The following immunological studies were performed: Serum immunoglobulins: IgG: 1,410 mg/dl (639-1,349 mg/dl); IgA: 386 mg/dl(70-132 mg/dl); IgM: 106 mg/dl (56-352 mg/dl); IgE: 7,310 IU/ml (0-230 IU/ml).

The function of neutrophil migration was detected using a chemotactic test. This patient's result was 25.1 cells/HFP without stimulation.(normal negative control: 3.3 cells/HFP). After stimulation with 10⁻⁸ M formyl methionyl leucyl phenylalanine (fMLP), the result for this patient was 97.7 cells/HFP (normal: 10.4 cells/HFP).

The function of respiratory

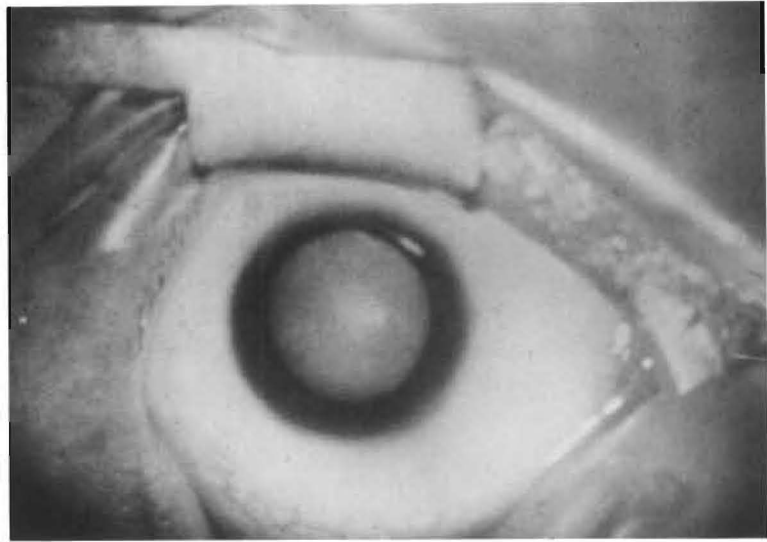


Fig. 1 The lens showed total opacity in this 16 year-old victim of atopic dermatitis.

burst was detected by peroxidation of atopic dermatitis patients.²⁻⁵ Severe lesions of atopic dermatitis located over the face seem to be an important factor for the development of atopic cataracts. Reported possible causes for this complication in patients with atopic dermatitis include prolonged use of corticosteroids and chronic periorbital scratching.⁶ Our patient had just taken oral corticosteroid for about 3 days, but he had the habit of periorbital scratching during the present episode.

Progressively blurred vision limited his daily activity. Lens aspiration and intraocular lens implantation in the right eye were performed under general anesthesia on the 14th day after admission. The operation was successful and the same procedure was performed in the left eye half a month later.

DISCUSSION

Cataract is a rare but known complication in atopic der-

matitis patients.²⁻⁵ Severe lesions of atopic dermatitis located over the face seem to be an important factor for the development of atopic cataracts. Reported possible causes for this complication in patients with atopic dermatitis include prolonged use of corticosteroids and chronic periorbital scratching.⁶ Our patient had just taken oral corticosteroid for about 3 days, but he had the habit of periorbital scratching during the present episode.

Amemiya and Matsuda⁴ studied a series of 10 patients and found that the common clinical features of atopic dermatitis in patients with cataracts include: eczema in infancy; transient remission of dermatitis; recurrence of atopic dermatitis of the whole body, especially prominent over the face; and frequent postpubertal appearance of widely distributed dermatitis, especially active over

the face during puberty. Our patient had all of these features.

Increasing production of free radicals, hyperactive function of respiratory burst, and consumption of antioxidants have been recently observed in areas of lenses and retinas in human cataractogenesis has been proposed.⁷ Micelli-Ferrari *et al.*⁷ suggested that retinal peroxidation might play a key role in human cataractogenesis. H₂O₂ was measured with flow cytometric analysis of dichlorofluorescein diacetate (DCFH) peroxidation. Neutrophils (2 x 10⁶ cells/ml) preloaded with DCFH for 15 minutes were stimulated with phorbol myristate acetate (PMA) for 30 minutes. Results were analyzed by a flow cytometer and expressed as arbitrary fluorescence units.⁸ The higher the fluorescence units, the more hyperactive the respiratory burst function in this patient. Our patient had an elevated peroxidation test result and revealed hyperactive respiratory burst function.

Neutrophils have an important role as the first line of the body's surface defense against extracellular organisms. In response to chemoattractants, neutrophils migrate into tissue and inflammatory sites. Reactive free radicals from neutrophils can kill bacteria intracellularly and extracellularly. These free radicals can also damage the neutrophil itself and the surrounding tissues. Yukie and Osamu⁶ reported an elevation

in peroxides and a decrease in leukocyte superoxide dismutase inducibility in atopic dermatitis patients, especially in those complicated with cataract formation. Excessive peroxidation formation seems to correlate to atopic dermatitis with cataract formation. We think that hyperactive neutrophil migration and hyperactive respiratory burst function may play a key role in cataract formation in this atopic dermatitis patient.

Swanson and Tuesdale⁹ found that the selenium content of cataract lenses was very much lowered, up to one sixth less than the normal selenium concentration. Arlot-Westerlund and Norrby¹⁰ reported that the formation of free radicals may be involved in the development of cataracts, that vitamin E prevents the formation of free radicals in cell membrane, and that selenoenzyme GSH-px converts free radicals to harmless metabolites. They reported the case of a 35 year-old patient with posterior subcapsular cataract who received oral medication of 600 µg selenium (as selenomethionine) and 1,200 mg vitamin E daily. After 2 months of treatment, a regression of the paracentral opacities was observed.¹⁰ Our patient never received medication for cataracts because of total opacity in both lenses.

Surgical intervention in the form of cataract surgery or penetrating keratoplasty should be considered once inflammation has

been suppressed. The results of cataract surgery are generally good, and a lower rate of complications has been reported in the recent literature.⁵ In our patient, the operation was uncomplicated and visual acuity was restored.

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