Synthetic Fiber Granuloma

'Teddy Bear' Granuloma of the Conjunctiva

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 Conjunctival synthetic fiber ("teddy bear") granulomas result from a granulomatous response to synthetic fabric fibers introduced into the conjunctival sac. There is a striking propensity for these lesions to develop in the pediatric age group, to be unilateral, and to be situated in the inferior conjunctival fornix. It is believed that proximity of the eye to comforting blankets, fabric toys, or forcibly applied pullover sweaters may provide the opportunity for ocular inoculation. Described below is the case of a 6-year-old girl who had a conjunctival synthetic fiber granuloma that exhibited the characteristic clinical and pathologic features of these lesions.

REPORT OF A CASE

A 6-year-old black girl was brought to the eye clinic by her mother because of a prominent yellowish-white mass involving the inferotemporal aspect of her right conjunctival fornix (Figure 1). The mass measured about 10 × 10 mm. Several hairs were seen protruding from the mass. The lesion was considered to be congenital and was thought by the consulting ophthalmologist to most likely be a dermoid.

The lesion was excised and, at the time of gross examination in the ophthalmic pathology laboratory, seven eyelashes were observed protruding from its surface. On microscopic examination, some sections contained deeply pigmented structures in the superficial aspect of the lesion that appeared to be hair shafts. They contained brown pigment granules, had a prominent central core, and corresponded to the lashes that had been noted at the time of the clinical examination.

Deeper in the lesion were countless, much less pigmented structures that had evoked a foreign-body giant-cell reaction (Figure 2). They were markedly birefringent when examined in polarized light, and many exhibited a rainbow of colors when sectioned obliquely or longitudinally (Figure 3). Most of these structures had smooth borders. Many others had scalloped edges (Figure 4). A prominent infiltrate of eosinophils was present throughout the lesion. Features characteristically seen in conjunctival dermoids (eg, dense collagenous connective tissue, sebaceous glands, and sweat glands) were absent.

COMMENT

Most of the foreign bodies in the lesion could be assigned to one of two categories. The first type had a smooth contour and contained many black dots. The second type had scalloped edges and did not contain black dots. The presence or absence of pigment is attributable to differences in the chemical composition of the two types of fibers. During fiber fabrication, delustering agents are added to diminish the plastic character of the final fabric. Commonly used delustering agents are titanium, barium, or zinc compounds, all

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of which appear in sections as scattered black granules.

In 1984, Weinberg and colleagues described five young patients who had conjunctival granulomatous inflammation surrounding filamentous foreign material. Polarization microscopy, special histochemical staining, scanning electron microscopy, and energy-dispersive roentgenographic elemental analysis identified the inciting material as being predominantly synthetic fabric fiber.

Weinberg and colleagues indicated that synthetic fabric fibers were a previously unrecognized cause of conjunctival inflammatory masses. All of the granulomas in their series occurred unilaterally in young patients who ranged in age from 4 to 17 years. In four of their five patients, the foreign-body granuloma involved the conjunctiva of the inferior fornix.

The only other two reports, to my knowledge, that have appeared in the American literature were published in 1985 and 1991. In the first report, the patient was a 2-year-old girl who had a synthetic fiber granuloma in her right inferior conjunctival fornix. Resnick and colleagues subsequently described a 5-year-old girl who had a mass involving the palpebral conjunctiva near the fornix.

Two reports of synthetic fiber granulomas involving the conjunctiva have appeared in the European literature. In 1986, Arocker-Mettinger and colleagues described a 2-year-old Austrian boy who had a large synthetic fiber granuloma in his left inferior conjunctival fornix. In 1992, Offret and Quillard reported the case of a 5-year-old French girl who had a synthetic fiber granuloma in her right inferior conjunctival fornix. The initial clinical diagnosis was pseudotumor. The mass failed to respond to topical corticosteroid treatment and was excised for pathologic examination.

The predilection of these granulomas to develop in the pediatric population is intriguing. Weinberg et al remarked that, “It is possible that the proximity to comforting blankets, fabric toys, or forcibly ap-
plied pullover sweaters may provide the opportunity for ocular inoculation."

The histopathologic features of the lesion in the present case are characteristic of those observed in the nine previously described patients. Clinically, this patient followed the same pattern with respect to age, unilaterality, and location of the lesion in the inferior conjunctival fornix. She had been exposed to all of the pathogenetic sources mentioned by Weinberg et al (ie, blankets, fabric toys, and forcibly applied pullover sweaters). The seven structures that had been regarded clinically as being part of a dermoid are believed to be her own cilia that became embedded in the inflammatory mass.

Although a decade has passed since conjunctival synthetic fiber granulomas were first recognized, experience demonstrates that most ophthalmologists and general pathologists are unfamiliar with the clinical and pathologic features of these lesions.

Accepted for publication April 15, 1994.

This study was supported in part by a grant from Research to Prevent Blindness Inc, New York, NY.

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REFERENCES