

# ABSTRACTS

A series of studies has been published recently in the medical literature which is relevant to the management of soft contact lens patients. The researchers have utilized scanning electron microscopy to examine surface deposits on soft lenses. Previous studies have provided strong evidence that such lens deposits contribute to the development of giant papillary conjunctivitis. The abstracts of four studies are presented to provide the reader with an overview of important recent work in this area.

**Soft contact lenses from patients with giant papillary conjunctivitis.** Fowler, S.A., Greiner, J.V. and Allansmith, M.R. *Am. J. Ophthalmol.* 88(6): 1056-1061, June 1979.

Scanning electron microscopy was used to examine the surfaces of three categories of soft lenses. These included never-worn lenses, lenses with heavy surface coating from patients with lens-associated giant papillary conjunctivitis, and lenses with similar heavy surface coating from asymptomatic patients. The never-worn lenses were strikingly cleaner than the worn lenses but no significant differences could be seen between the two types of worn lenses. The anterior surfaces of the lenses showed thick deposits with a trabeculated morphology having surface debris which appeared to be mucus, bacteria and cells. The deposits on the posterior surfaces of lenses were much smoother. These findings support the concept that individual patient differences are more influential in the development of giant papillary conjunctivitis than differences in lens deposits.

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**Evolution of soft lens coatings.** Fowler, S.A. and Allansmith, M.R. *Arch. Ophthalmol.* 98(1): 95-99, Jan. 1980.

To investigate further the reported possibility that surface deposits on soft contact lenses contribute to giant papillary conjunctivitis, we performed scanning electron microscopy on 22 lenses worn for varying durations by a group including persons who had never worn contact lenses and asymptomatic persons who had, and on five never-worn lenses. Thirty minutes' wear resulted in covering of about 50% of the anterior surface with scattered cell-membrane-like and mucus-like material, with mucus-like material on top of cells in places. Eight hours' wear produced about 90% covering with more complex coatings. Routinely worn and cleaned lenses had still more complex coatings on more than 90% of the surface. Deposits were found on routinely worn lenses even after professional cleaning. We conclude that all worn soft contact lenses have coatings that become more complex with time and may never be removed completely.

Author's Abstract.

**The surface of the continuously worn contact lens.** Fowler, S.A. and Allansmith, M.R. *Arch. Ophthalmol.* 98(7): 1233-1236, July 1980.

The anterior surfaces of continuously worn therapeutic contact lenses and routinely cleaned cosmetic lenses were compared by scanning electron microscopy. The continuously worn lenses were uniformly and completely coated with material thicker and smoother than that on the incompletely coated cosmetic lenses. It is concluded that continuously worn lenses build up coatings steadily, whereas routinely cleaned lenses have at least part of the coating removed with each cleaning.

Author's Abstract.

**The effect of cleaning soft contact lenses. A scanning electron microscopic study.** Fowler, S.A. and Allansmith, M.R. *Arch. Ophthalmol.* 99(8): 1382-1386, Aug. 1981.

Scanning electron microscopy was used to investigate the effectiveness of surfactant and enzyme cleaners in removing coatings from soft contact lenses. We examined ten continuously worn lenses and 15 lenses worn and cleaned regularly for at least six months. About 30% of the surface of continuously worn lenses cleaned with surfactant or enzyme was uncoated; smooth, matted coating covered the remainder. Continuously worn lenses cleaned with the combination surfactant and enzyme cleaner had similar deposits covering 50% of the surface. Lenses worn and cleaned regularly had more deposits after cleaning with surfactant or enzyme than after cleaning with combination cleaner. Approximately 25% of the surface of lenses cleaned with the combination was coated with deposits. The deposits on both types of lenses were about 30% less thick after use of the combination cleaner than with either single cleaner. The coating on worn contact lenses is not completely removed by any method we tested.

Author's Abstract.

## Clinical Implications

In a continuing attempt to understand the pathogenesis of giant papillary conjunctivitis, the authors in this series of papers examine the lens deposits, as these have been implicated in prior studies as containing the antigen responsible for the conjunctival reaction. With the knowledge acquired from these studies of the evolution and tenacity of lens deposits, the clinician might consider stressing to the soft lens patient the following points:

1. Deposits start to form immediately.
2. Deposits, if left unchecked, can lead to complications which may force the end of contact lens wear.
3. No current regimen of lens cleaning assures a totally clean lens surface. (A common misconception by patients is that enzymatic cleaning at any interval restores the lens to its new condition.)
4. The front surface of a lens deserves particular attention in cleaning.
5. As some surface deposition is inevitable, and as some individuals seem predisposed to reactions to it, periodic professional examination of the tarsal conjunctival surface is necessary, particularly in the case of extended-wear lenses.
6. Periodic lens replacement may be necessary for the purpose of maintaining a clean lens on the eye.

Stark, W.J., Martin, N.F.:

**Extended-Wear Contact Lenses for Myopic Correction.** *Arch. Ophthalmol.* 1981; 99: 1963-1966.

## Clinical Implications:

The object of this study was to evaluate the long-term effects of extended wear lenses, particularly as an alternative to surgical correction of myopia. In this regard, the contact lenses are preferred by the authors.

However, the research provides information to make a comparison with a more readily available option, daily wear contact lenses. Some interesting data are:

- visual acuity less than 6/9 (20/30) in 20% of cases,
- rate of lens replacement 0.68 lenses per year per patient,
- average superior neovascularization 1.02+0.47 mm. compared to 0.39+0.13 mm. for myopic controls.
- 38% of patients lost to follow-up.

As no comparable data were collected for myopic daily wear contact lenses, no conclusions can be drawn. However, the authors caution against the indiscriminate use of extended wear lenses for myopia, thereby expressing a preference for daily wear lenses where feasible.

## Author's Abstract

The long-term effects of an extended-wear contact lens (perfilcon A [Permalens]) for myopia were evaluated in 106 patients who had successfully worn the lens for four to eight years (median, 4.94 years). Visual acuity was 6/12 (20/40) or better in 95% of the 207 eyes fitted. Corneal neovascularization, when encountered (8.7%), was mild and did not reduce visual acuity. There were no cases of infectious corneal ulcer or scarring or of permanent visual loss from use of the lens. In selected patients, use of extended-wear lenses seems to be a reasonable form of optical correction of myopia, and they deserve further study. The use of these lenses is discussed as an alternative to the experimental procedure of radial keratotomy.

**Rennie, I.G., Parsons, M.A.: Lysozyme Distribution in Human Lacrimal Glands and Other Ocular Adnexa.** *Arch. Ophthalmol.* 1981; 99: 1850-1853.

## Clinical Implications

Richard Hill has described tear protein and specifically lysozyme as assuming the images of both benefactor and villain in contact lens practice: benefactor in the sense of acting germicidally and villain in the sense of lens spoilage.

The authors offer elegant proof of the origins of this dichotomous tear protein. This significant contribution to the knowledge of tear physiology is a step toward better understanding the interrelationships of the cornea, the tear film and the contact lens.

## Author's Abstract

In an immunohistochemical study of the human lacrimal glands and other orbital adnexa, lysozyme was found to be present in