



Colonization of therapeutic contact lens by dematiaceous fungi

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ABSTRACT

Purpose: To report 2 patients with colonization of therapeutic contact lens with dematiaceous fungi.

Methods: Case report.

Results: The first patient had a retained soft contact lens on an opaque cornea for 4 years with brownish black multiple colonies on the soft contact lens and culture grew *Bipolaris* spp. The second patient was on therapeutic contact lens for pseudophakic bullous keratopathy for 4 months and developed a brownish colonization of contact lens with unidentified dematiaceous fungi. Both the patients had conjunctivitis but did not develop fungal keratitis.

Conclusion: Judicious use of therapeutic contact lens is required in agrarian countries with adequate emphasis on strict adherence to the standard protocols and frequent replacement of the lens.

1. Introduction

Therapeutic contact lenses are extended wear soft contact lenses with high water content and are commonly prescribed for conditions like recurrent corneal erosions, bullous keratopathy, post refractive surgery, smaller perforations and ocular surface disorders [1]. There have been a few case reports of fungal growth through the matrix of daily wear soft contact lens in the 80's [2]. Continuous evolution of the physical properties of the contact lens, coupled with significant improvement in after care of contact lens wear and more frequent replacement of daily lenses, have tried to address the risk of infection among this population of contact lens users [3]. Yet these factors have not reduced the overall risk of contact lens related infection and *Pseudomonas aeruginosa* is the most common causative organism accounting for one third of contact lens related infective keratitis [4]. Less than 5% of contact lens related infectious keratitis is caused by fungus. More importantly there is a significant increase in the incidence of outbreaks of filamentous fungal keratitis amongst contact lens wearers even in developed countries and the risk of contamination was found to be at patients own environment and certain contact lens solution [5].

Dematiaceous fungi are saprophytic fungi, commonly seen in soil and plants in warmer and humid climates and have characteristic brown to black pigmented hyphae. They account for approximately one third of fungal keratitis in developing countries [6]. This case series reports two patients with colonization of the therapeutic contact lens with dematiaceous fungi.

2. Case report

2.1. Case 1

A 51 year old diabetic male, with nature of occupation being clerical, presented with complaints of sudden onset redness, irritation and mild pain in the left eye for a week. He gave a past history of being diagnosed with a painful corneal pathology four years back and was planned for a corneal transplant which was later aborted due to poor glycemic control. He was lost to follow up for four years and presented with the above mentioned complaints. The visual acuity in right eye was 20/20 and in left eye was hand motion. On slit lamp biomicroscopic examination, his right eye was normal. The left eye had lid edema and circumcorneal congestion. A soft contact lens was seen overlying on an opaque cornea. The contact lens had multiple blackish brown and whitish elevated colonies with feathery margins (Fig. 1A–C). There was no epithelial defect or infiltrate on the cornea after removal of the contact lens. The cornea had total leucomatous opacity with a 360° superficial vascularisation. The anterior chamber details were not visible. On further questioning, patient remembered the application of contact lens four years ago and forgot about its presence in the eye. A microbiological smear was prepared from one half of the contact lens and was subjected to Grams stain and KOH wet mount. The other half of the contact lens was cultured on blood agar and potato dextrose agar. Smear showed pigmented fungal filaments and culture grew *Bipolaris* spp.

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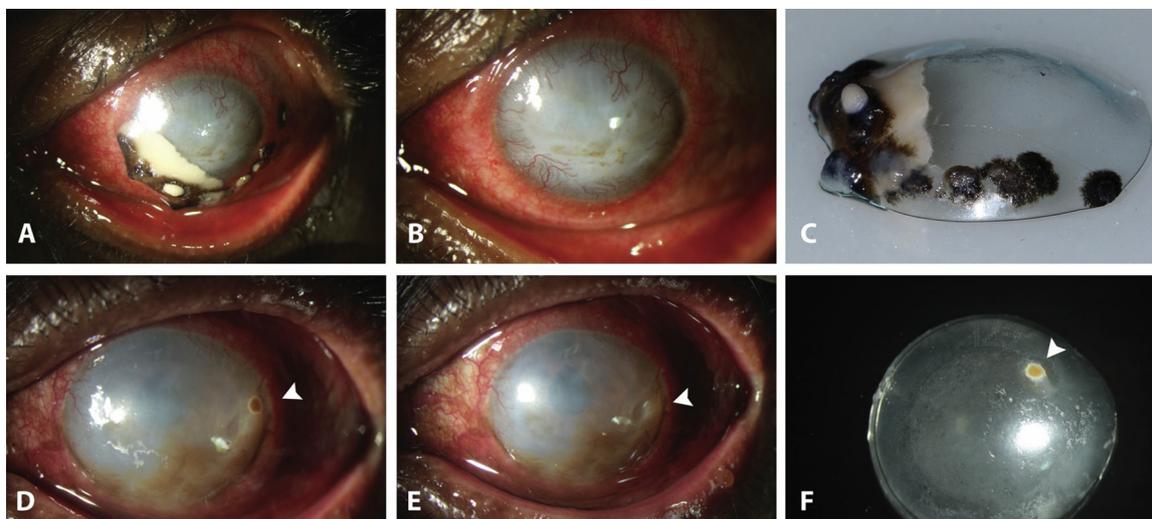


Fig. 1. Colonization of therapeutic contact lens by Dematiaceous fungi. 1A-1C: Case 1: A - Soft contact lens was seen on an opaque cornea with multiple blackish brown elevated colonies with feathery margins on the contact lens and white debris under the contact lens. B- The cornea had total leucomatous opacity with 360° superficial vascularisation without an epithelial defect or infiltrate. C- Soft contact lens with dematiaceous fungi colonization. 1D-1F: Case 2: D- Peripheral 2 x 2 mm elevated brownish pigmented colonization of the contact lens. E- Absence of infiltrate. F- Soft contact lens with dematiaceous fungi colonization.

Immediately after the smear examination, the patient was started on 5% Natamycin eye suspension and 0.5% Moxifloxacin eye drops six times a day for a week. The symptoms and signs subsided with the treatment and the patient was asymptomatic at 1 week. The patient is planned for optical penetrating keratoplasty for vision correction.

2.2. Case 2

A 66 year old male, farmer by occupation, was diagnosed with corneal decompensation in the left eye due to pseudophakic bullous keratopathy and secondary glaucoma was being treated with therapeutic contact lens (Acuvue Oasys, Johnson & Johnson Vision Care, Jacksonville, FL, USA) for ruptured bullae. He was using 0.3% ofloxacin eye drops twice a day and 0.005% latanoprost eye drops at night for the left eye. He presented four months after the application of the contact lens with sudden onset pain, irritation and redness in the left eye of one week duration. His visual acuity was 20/20 in right eye and counting fingers close to face in left eye. The right eye was normal. On slit lamp biomicroscopic examination, his left eye showed lid edema, circumcorneal congestion and a decompensated cornea with a therapeutic contact lens. Closer examination revealed a peripheral 2 x 2 mm elevated brownish pigmented colonization of the contact lens (Fig. 1D-E). An epithelial defect of the underlying cornea corresponding to the site of contact lens colonization was seen after removal of the contact lens. There was no corneal infiltrate. The rest of the cornea showed signs of endothelial decompensation with epithelial bullae and stromal edema and stromal haze. The pigmented material from the contact lens was subjected to smear (Grams stain and KOH wet mount) and culture examinations (Blood agar and Potato dextrose agar). Pigmented fungal filaments were seen on microbial smear of scrapings from the contact lens. The patient was started on 5% Natamycin eye suspension and 0.5% Moxifloxacin eye drops six times a day for a week during which time, the symptoms and signs subsided. Culture grew unidentified dematiaceous fungi.

3. Discussion

Dematiaceous fungi account for approximately one third of the fungal keratitis in south India. The common dematiaceous fungi are *Curvularia*, *Bipolaris*, *Cladosporium*, *Lasiodiplodia* etc [6]. High amount of viable fungal spores especially dematiaceous, are seen in the air in rural areas after the thrashing activities of harvesting [7,8]. It is

interesting to note that the second patient is a farmer by occupation.

Therapeutic contact lenses are extended wear soft contact lens with high Dk coefficient, commonly used in the treatment of epithelial disorders. They are made of either high water content as in conventional therapeutic contact lenses or higher silicone content used for shorter wear. In bullous keratopathy, therapeutic lenses are used for a prolonged period of time for pain relief. Significant cellular debris has been associated with the extended use of contact lens [9].

Three decades earlier, Ahearn et al reported the growth of fungi in the extended wear soft contact lenses and most commonly it appeared to have got contaminated while they were on the eye [10]. Dematiaceous fungi namely *Cladosporium* and *Curvularia* penetrated through the matrix of the soft contact lens more rapidly than other fungi. They were associated with conjunctivitis and punctuate epithelial erosions but not keratitis and the symptoms cleared up when the contact lens was removed [11].

Also fungi can form biofilms in commonly used soft contact lens and the characteristics of these biofilms like the metabolic activity, thickness and the architecture were influenced by the surface properties of the contact lens. Fungal colonization was found to be significantly low in asymptomatic lens wearers and among the fungi isolated in asymptomatic lens wearers, dematiaceous fungi was the most common. Also for reasons unknown fungal colonization were unlikely to be associated with fungal keratitis [12]. The level of fungal colonization of contact lens was higher in India than other countries due to environment related factors. Soft contact lens cleaning solutions have been documented to have an inhibitory effect on fungal biofilm formation [13]. Adequate stress on patient education to avoid manual rubbing of the lenses is essential to prevent these infections. The use of therapeutic lenses, when limited to three months has reduced the risk of corneal infection [14]. Frequent disinfection and replacement of therapeutic contact lens is recommended in the follow up of type 1 keratoprosthesis patients to prevent fungal colonization and subsequent keratitis and endophthalmitis [15].

Retained contact lens in the fornix for a maximum period of 11 years, have been reported in the past, often presenting as chalazion, foreign body or cyst in the upper fornix. Soft lenses are more commonly to be retained than hard lenses due to their mechanical properties [16]. It is interesting to note that, the first patient in this case series is also the first patient to be reported with retained contact lens on the cornea for a prolonged period of time.

To conclude, fungi are the transient residents of the eye depending

on the availability in the atmosphere. Judicious use of therapeutic contact lens is required in agrarian countries with adequate emphasis on strict adherence to the standard protocols and frequent replacement of the lens. Farm activities should be avoided and the lenses be cleaned thoroughly after such activities.

Conflict of interest

None.

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