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Pseudomonal keratitis-related soft contact lens wear : about 2 cases

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Summary:
Infectious keratitis in contact lens wearers is becoming increasingly common. They require standardized management in order to avoid diagnostic and therapeutic delays that may affect the visual prognosis. We present two case reports of individuals who developed infectious keratitis related to Pseudomonas aeruginosa while wearing daily soft contact lenses. A 31-year-old woman, who reported using daily silicone hydrogel contact lenses presented with a rapid onset of infection. The infection responded to antibiotics in fortified eye drops for 10 days, and after treatment, a stable situation with a corrected visual acuity of 2/10 was achieved after 6 weeks. Another 29-year-old woman who had been using conventional soft contact lenses before switching to daily silicone hydrogel contact lenses for 12 to 14 hours of wear developed severe keratitis in her left eye after 2 months of wear. The evolution was marked by the extension of the abscess and a corneal perforation despite the treatment. She underwent a transfixing keratoplasty to obtain a final visual acuity of 3/10.

Key words: *Pseudomonas, Keratitis, contact lens, silicone hydrogel*

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I. Introduction:

Infectious keratitis in contact lens wearers is becoming increasingly common. The risk factors are essentially: poor hygiene, contamination of cleaning solutions,extended wear, and especially overnight wearing (1). They represent a real diagnostic and therapeutic emergency, the prognosis of which depends on the rapidity and efficiency of the treatment. Pseudomonas is the most frequently isolated pathogens. The microbiological diagnosis is evoked on several grounds, but only corneal scraping provides a definitive diagnosis by direct examination or culture, isolating the germ responsible(2). This allows the initiation of appropriate antibiotic therapy, with adequate adjuvant measures to improve the prognosis.

We present two cases of individuals who developed infectious keratitis related to Pseudomonas aeruginosa while wearing daily soft silicone hydrogel. contact lenses.

Clinical cases:

First case:

This is a 31-year-old woman, with no notable pathological history, followed in ophthalmology for myopia since the age of 6 years, initially under optical correction glasses and regularly changed. For 1 year, she opted for siliconehydrogeel contact lenses, alternating with her glasses, but for 3 months she has been wearing her silicone hydrogel lenses on a daily basis. The patient described a f extended wear,week before the emergency consultation, she had a red eye with decreased visual acuity and moderate pain. On examination in the ophthalmological emergency room, the visual acuity without correction was 1/10 in the affected right eye and 3/10 in the left eye. At LAF: minimal palpebral secretions, diffuse conjunctival hyperemia, presence of a 2.5 X 2 mm lower nasal para-axial corneal abscess, fully fluorescein-impregnated, with preserved corneal sensitivity [Figure 1]. There was no anterior chamber reaction and the fundus examination was unremarkable. A corneal scraping sample was taken and sent to the laboratory with the lens and the preservation box. Direct examination revealed the presence of Pseudomonas aeruginosa, confirmed by culture and multi-sensitive on susceptibility testing. The patient was put on Vancomycin (25 mg/mL) fortified eye drops, combined with Tobramycin and Gatifloxacin after 48 hours. The patient responded well to the treatment and the evolution was marked by a decrease in the size of the abscess as early as day 2 of the treatment with total re-epithelialization after 10 days (Figure 2). Corticosteroid therapy with Prednisone eye drops was started at 3 weeks. There was still a corneal clearing and a slight corneal thinning in front of the cornea confirmed by an OCT of the anterior segment, measuring 2.3 x 1.9 mm (Figure 3). The final best visual acuity after 6 weeks of treatment was at 8/20.

Second case

A 29-year-old woman, type 1 diabetic on insulin, followed for high myopia since her childhood, who had been using conventional soft contact lenses with good correction and slight discomfort for 5 years. She decided 2 months ago to switch to daily disposable silicone hydrogel contact lenses, for a daily wear of 12 to 14 hours. She experienced a sensation of red eye and decreased visual acuity with tearing and photophobia, which intensified rapidly in 4 days. At the admission examination, the visual acuity was at 2/20 in the left eye concerned and 1/10 in the right eye, without correction. There was conjunctival hyperhemia, conjunctival secretions, slight decrease in corneal sensitivity, inferior para-axial corneal abscess of 5 x 3.3 mm, with blurred and edematous borders with peri-keratotic circle without anterior chamber reaction (Figure 4). The fundus was not accessible. An emergency corneal swab was taken and sent to the laboratory with the lens case and the preserving fluid. A Pseudomonas Aeruginosa was isolated on bacteriological analysis of the lens case and the culture of the sample, sensitive to the usual antibiotics on the antibiogram. A treatment with Vancomycin and Ceftazidime fortified eye drops (hourly drops for 48 hours) was started. The evolution was marked by a corneal thinning and a descemetocele at D3, complicated by a corneal perforation the following day at D4 despite a hypotonizing treatment. The patient underwent blepharorraphy; and at one week of admission, an emergency ransfixing keratoplasty was performed (Figure 5), finally allowing the patient to have a best corrected visual acuity at 10/20 after a 7-month follow-up.

II. Discussion:

Contact lens wear is the main risk factor for infectious keratitis[3].The risk factors are poor maintenance, also the use of conventional soft contact lenses with low oxygen permeability (Dk) by creating significant corneal hypoxia, and mainly prolonged nighttime wear aggravating this hypoxia further(4).

Compared to conventional lenses.the severity of microbial keratitis is significantly reduced with the wearing of daily disposable silicone hydrogel contact lenses with high dk/e allowing a level of corneal oxygenation and edema at a level close to that of an eye closed by (5).this is the type that was found for our two patients.

Pseudomona aeruginosa frequently produces rapid stromal necrosis, severe inflammation of the anterior chamber and sometimes towards corneal perforation (6). Thus, pseudomonas was the causative organism found in our two patients, with corneal perforation as a complication in one of the patients. Corneal semiology, rapid evolution of lesions, presence of risk factors allow the clinician to evoke a microbiological diagnosis but only corneal scraping allows, by isolating the bacterium(s) involved, to make a diagnosis of certainty (2).

In our two patients, we were able to isolate the responsible germ from the corneal samples, but also, for one of the patients, from the lens storage case; this shows the importance of also sending the entire lens kit (case and maintenance liquid) to the laboratory for analysis.

Bacterial keratitis requires a standardized management in order to avoid any diagnostic and therapeutic delay that could darken the visual prognosis. The mainstay of initial management of severe infectious keratitis remains aggressive antimicrobial therapy to limit spread to the sclera and anterior chamber (7).

Antibiotic treatment is started as soon as corneal sampling is performed. It is adapted to the severity of the lesions, the clinical orientation and later to the antibiogram. Reinforced or fortified eye drops allow high corneal concentrations of antibiotics to be obtained and are indispensable in the treatment, even if their local toxicity is not negligible. There is no international consensus regarding the nature of antibiotic eye drops to be used in bacterial keratitis. However, the role of surgical intervention in the form of therapeutic keratoplasty should be considered in view of the relatively satisfactory results (7).

Our experience in the department is based on the epidemiology of the germs frequently isolated and antibiotics such as Vancomycin, gantifloxacin, metronidazole, Ceftazidime or aminoglycosides, used in dual or triple therapy, are often effective. The first patient progressed well on triple therapy. The second patient consulted late and the rapid extension of her infection, despite initial dual antibiotic therapy, required hot surgical treatment with a good visual prognosis.

Antibiotic ointments can be useful at night or in case of poor therapeutic compliance in mild cases. Also subconjunctival injections of antibiotics may be useful in cases of advanced damage (scleritis, risk of perforation) or poor compliance with treatment. Systemic antibiotics are useful by oral or intravenous route in case of scleral, intraocular or intraorbital extension or in case of specific gonococcal infection (2).Corticosteroids have been shown to be effective as adjuvant therapy and can be used in certain well-defined circumstances. Surgical treatment is sometimes necessary(7).

III. Conclusions:

Previous reports of Pseudomonas aeruginosa-associated keratitis in soft contact lens wearers demonstrate corneal problems due to prolonged wear or unsuccessful cleaning of contact lenses. Hygiene rules

should be strictly followed by patients and staff using soft or hard contact lenses for visual correction or therapeutic reasons.

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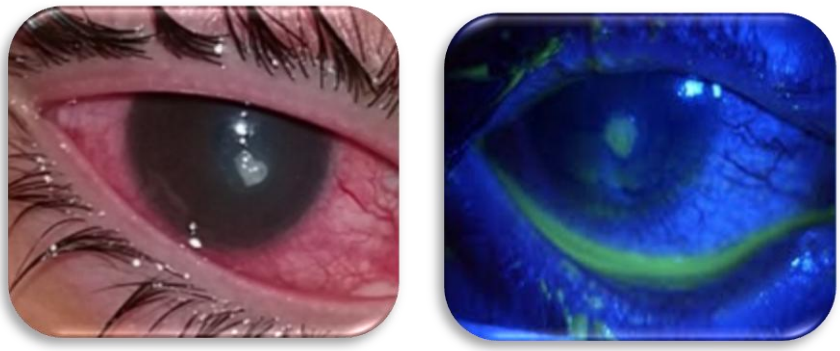

Fig 1: Lower nasal para-axial corneal abscess (A) impregnated with fluorescein (B)

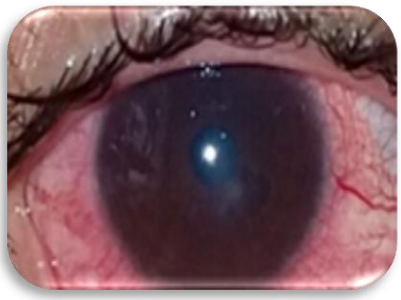

Fig 2 : aspect de l'abcès après 10 jours de traitement

Figure 3: Corneal clearing appearance at 6 weeks of treatment (C) with thinning on OCT (D)

Figure 4 :Severe inferior keratitis reaching the corneal center

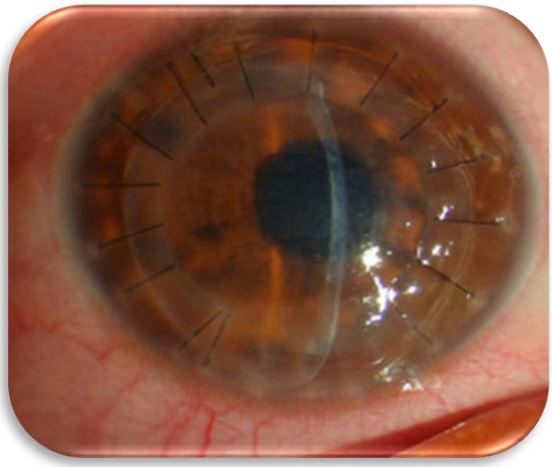

Figure 5: Appearance after 15 days of emergency ransfixing keratoplasty

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