

Clinical Pharmacy 2015 : Two cases of *Candida parapsilosis* corneal graft infection from a single eye center - Hind Manaa Alkatan - King Saud University

Hind Alkatan

King Saud University, Saudi Arabia

Fungal infection of the cornea may constitute 6–53% of all cases of ulcerative keratitis and the majority follow trauma with plant material. Clinically, it is recognized by coarse granular corneal infiltrate within 24–36 h after trauma. The vast majority are caused by septate filamentous fungi, however compromised corneas are subject to yeast infection: usually *Candida* species

Case reports

A 33-year-old Saudi male, known case of keratoconus presented to a private eye center 1 year ago (early 2014) and underwent penetrating keratoplasty (PKP) in the right eye with no complications. He developed mild haze at the edge of the graft 1 month post PKP followed by anterior chamber (AC) reaction and pigmented keratic precipitates (KPs). There was no definite infiltrate at that time. The AC tap showed pigment laden macrophages, dispersed pigment and yeast forms. He was started on amphotericin B topically and was referred to our hospital with VA 20/400 OD which improves to 20/300 with PH and IOP of 24 mmHg, OD (with the use of anti-glaucoma medications). Slit lamp examination (SLE) of his right eye showed whitish infiltrate versus scar at the junction of the graft, deep AC with +4 cells and no further view.. He was started on Voriconazole 1% eye drops QID, Predforte drops q 4 h daily tapered over 2 weeks and Timolol twice daily to control his IOP, all OD. Follow up showed increasing infiltrate and the patient was admitted for corneal biopsy which further confirmed the presence of these yeast in the areas of infiltrate . The yeast forms proved by culture to be *Candida parapsilosis*.

An 82-year-old Saudi male presented for the first time to King Khaled Eye Specialist Hospital (KKESH) in 2011 with phthisical left globe because of corneal scarring secondary to chicken pox infection in childhood. He also had immature cataract with light perception (LP) vision on the right. Systemically he was known to have diabetes and bronchial asthma. He underwent PKP, extracapsular cataract extraction (ECCE) and posterior chamber (PC) intraocular lens (IOL) implantation in the right eye with guarded prognosis elsewhere in December 2012. His graft failed after 1 year. He had another PKP in early 2014 -in the same eye center of case 1- and developed a persistent epithelial defect for which medial tarsorrhaphy and Amniotic membrane transplant (AMT) were performed. He presented to KKESH in May 2014 with poor vision of counting fingers (CF) in the right eye, IOP of 16 mmHg and persistent epithelial defect involving 85% of the graft which was hazy. Remnant of AMT was seen centrally. Other findings included: intact sutures, deep AC with AC reaction (not specified) and an iris fixated PC IOL. The patient was admitted and a therapeutic PKP was performed in June 2014 and the tissue of the second graft was submitted for both microbiology and tissue diagnosis. The histopathologic examination of the previous corneal graft showed sub-acute keratitis and numerous yeast forms mainly at the periphery

of the graft, within the posterior stroma and retrocorneal collection of yeast forms along Descemet's membrane. His last follow up showed VA of HM, soft right eye with hazy graft, +1 flare in the AC, but no sign of active infection. He also developed choroidal detachment which was managed by choroidal drainage . The culture revealed the same type of *Candida* species.

Fungal keratitis accounts for 6–53% of all cases of ulcerative keratitis in variable studies and the majority of cases are due to septate fungi. The abnormal cornea in cases of dry eye syndrome, chronic ulceration, erythema multiform and possibly HIV infection is infected more commonly with *Candida*. In a small series of spontaneous ulcerative keratitis in immunocompromised patients 3 out of the 5 infected corneas (in 4 cases) were caused by *Candida albicans*. These cases were known intravenous drug abusers with proved HIV or AIDS in 3 out of the 4 cases. None of them had any predisposing factor for ulcerative keratitis and no history of trauma, contact lens wear or ocular surface disease. Uncommon *Candida* species such as *Candida lipolytica* and *Candida humicola* have been reported in post-traumatic keratitis. In regard to corneal graft fungal infections in the form of infectious crystalline keratoplasty, several *Candida* species have been identified including *Candida guilliermondii* and *parapsilosis*. The most commonly isolated yeast in infections generally is *Candida albicans* however it seems that *Candida parapsilosis* is found with increasing frequency. *Candida parapsilosis* affects neonates and intensive care unit (ICU) patients. It has affinity for foreign material with infections being related to peritoneal dialysis catheters, central lines, prosthetic heart valves and other indwelling access devices. As a result *Candida parapsilosis* is found to be increasingly responsible for outbreaks in hospitals with the hands of healthcare workers being the predominant environmental source. Fungi secrete enzymes which are important for pathogenesis: phospholipases and proteases but the relationship between *Candida parapsilosis* virulence and phospholipases phenotype is unclear. On the other hand the surface adherence capacity of *Candida* has been found to be linked to the formation of biofilms. This adhesion feature seems to be critical in yeast pathogenesis especially for *Candida parapsilosis* as the organism is thought to be acquired from exogenous sources then adheres to devices and finally invades the host. Kuhn and his co-authors found predominant clonality of *Candida parapsilosis* in their outbreak isolates cultured from blood or catheter as well as at least one health worker hand isolate. Therefore they considered their outbreak to have nosocomial environmental origin. They also showed that the outbreak clone produced more biofilm than all other strains. The diagnosis of fungal infections in the ophthalmic practice requires: establishment of the presence of pathology, obtaining tissue to visualize the fungus and isolation of the responsible fungus, particularly by culture. The culture result in both our cases originating from the same outside eye center

(one from aqueous and the other from both aqueous and corneal tissue) confirmed *Candida parapsilosis* and no other pathogens. In regard to fungal infections of corneal grafts, Al-Assiri and his co-authors recommended routine fungal cultures of the donor rims at the time of PKP as an important diagnostic tool to allow identification of potential organisms that might be transmitted to the graft leading to a late-onset graft infection by fungi such as *Candida glabrata* in their reported case. In a previous study on mycotic keratitis in our institution (during the period: 2006–2009), filamentous fungi were more commonly isolated than yeasts accounting for 71.3% (*Aspergillus* being the commonest followed by *Fusarium*) compared to 28.7% yeast infection most commonly by *Candida* species. In that study 5 cases of *Candida parapsilosis* were identified, however the infection was associated with other virulent pathogens in all these cases. In regard to the management, combination of surgery and antifungal drug is the usual therapeutic modality for most of eye fungal infections. Fungal keratitis is usually treated with topical antifungals such as Natamycin and Amphotericin B and may require the use of Azoles especially for *Candida* keratitis. Finally debridement and surgical intervention may be eventually required such as in our second case which was treated by PKP. In addition, prophylactic antifungal therapy implementation

following PKP has been recommended in donor rim culture-positive cases. In conclusion, although we had only 2 successive cases within a short period of time originating from a single eye center (and not an outbreak), we believe that these are considered to be nosocomial infections. The corresponding eye care facility should be alerted for possible screening of their health workers. The practice of obtaining fungal cultures of donor corneal rims at the time of PKP has been also recommended.

Biography

Dr. Hind Manaa Alkatan, MD has completed her Ophthalmology Board in the year 1994 from King Saud University, Riyadh, Saudi Arabia and postdoctoral studies from Departments of Ophthalmology/Pathology, University of Manitoba and University of British Columbia, Canada in the year 1999. She is a Senior Academic Consultant Ophthalmologist and the Chair of the Pathology and Laboratory Medicine Department at King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia. She has published more than 55 papers in reputed journals and serving as an editorial board member of the Saudi Journal of Ophthalmology and the World Journal of Ophthalmology.

hindkatan@yahoo.com