CORNEAL ULCER AS THE FIRST MANIFESTATION OF HIV INFECTION: A CLINICAL CASE

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RESUME

Background. *Corneal ulcers are among the severe diseases that are difficult to treat. Most cases of corneal ulcers are caused by infectious etiology in the presence of predisposing risk factors, such as wearing contact lenses, eye injuries, chronic diseases of the accessory apparatus of the eye, dry eye syndrome. Of particular importance at present is the increase in cases of corneal ulcers among HIV-infected patients. HIV leads to thinning of the cornea and the formation of an ulcerative defect, and systemic immunodeficiency contributes to the rapid addition of a secondary infection.*
The aim. *Description of a clinical case of a corneal ulcer with perforation as the first sign of HIV infection.*
Materials and methods. *To assess the clinical case, we used a retrospective analysis of the patient's medical history and the results of laboratory research methods.*
Results. *This clinical example demonstrates the possibility of the occurrence of a corneal ulcer with perforation against the background of immunodeficiency caused by HIV-positive status. The patient came with a corneal ulcer complicated by perforation and fibrinous-plastic iridocyclitis. The localization of the ulcer at the limbus, the absence of loose infiltration of the edges, and high visual functions determined the gentlest surgical tactics in the form of suturing the ulcer defect by applying corneo-limbal sutures without separating the conjunctiva.*
Conclusion. *Timely drug therapy and surgical treatment led to the closure of the ulcer defect and restoration of visual functions. The postoperative course was smooth and had no peculiarities, despite the HIV-positive status of the patient and the lack of therapy for the underlying disease, since a corneal ulcer with perforation was the first manifest sign that forced the patient to seek medical help.*

Keywords: *corneal ulcer, corneal perforation, corneal ulcer etiology, HIV infection, drug treatment, corneal surgery*

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ЯЗВА РОГОВИЦЫ КАК ПЕРВОЕ ПРОЯВЛЕНИЕ ВИЧ-ИНФЕКЦИИ: КЛИНИЧЕСКИЙ СЛУЧАЙ

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РЕЗЮМЕ

Обоснование. *Язвы роговицы относятся к числу тяжелых заболеваний, которые с трудом поддаются лечению. Большинство случаев данной патологии имеют инфекционную этиологию при наличии предрасполагающих факторов риска, таких как ношение контактных линз, травмы глаза, хронические заболевания вспомогательного аппарата глаза, синдром сухого глаза. Особое значение в настоящее время имеет увеличение случаев язвы роговицы среди ВИЧ-инфицированных пациентов. ВИЧ приводит к истончению роговицы и образованию язвенного дефекта, а системный иммунодефицит способствует быстрому присоединению вторичной инфекции.*

Цель. *Описание клинического случая язвы роговицы с перфорацией как первого признака манифестации ВИЧ-инфекции.*

Материалы и методы. *Для оценки клинического случая использовался ретроспективный анализ истории болезни пациентки, результатов лабораторных методов исследования.*

Результаты. *В работе представлен клинический пример, демонстрирующий возможность возникновения язвы роговицы с перфорацией на фоне иммунодефицита, обусловленного ВИЧ-положительным статусом. Пациентка обратилась с язвой роговицы, осложненной перфорацией и фибринозно-пластическим иридоциклитом. Локализация язвы у лимба, отсутствие рыхлой инфильтрации краев, высокие зрительные функции определили максимально щадящую хирургическую тактику в виде ушивания язвенного дефекта путем наложения корнео-лимбальных швов без отсепаровки и покрытия конъюнктивой.*

Заключение. *Своевременная медикаментозная терапия и хирургическое лечение привели к закрытию язвенного дефекта и восстановлению зрительных функций. Послеоперационное течение было гладким и не имело особенностей, несмотря на ВИЧ-позитивный статус пациентки и отсутствие терапии основного заболевания, так как язва роговицы с перфорацией была первым манифестным признаком, заставившим пациентку обратиться за медицинской помощью.*

Ключевые слова: *язва роговицы, перфорация роговицы, этиология язвы роговицы, ВИЧ-инфекция, медикаментозное лечение, хирургия роговицы*

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BACKGROUND

A corneal ulcer is a serious eye condition characterized by damage to the corneal epithelium and stroma. Without adequate treatment, if left untreated, it may lead to vision loss due to purulent complications, such as corneal perforation, or the formation of dense opacity as a result of an inflammatory and destructive process. The factors that contribute to the development of this pathology are diverse. Keratitis often precedes the formation of a corneal ulcer, which may be caused by ocular trauma, inappropriate contact lens use, inflammation of accessory ocular structures, dry eye syndrome, or inability to close the palpebral fissure. These factors facilitate bacterial invasion through a primary superficial epithelial breach into the corneal stroma. The rising incidence of corneal ulcers among HIV-infected patients is of particular concern. Currently, human immunodeficiency virus (HIV) continues to be a significant global public health concern. According to data from the Moscow Regional AIDS Center, the Russian Federation is experiencing a substantial annual increase in the number of individuals infected with HIV. In 2021, there were 851,700 laboratory-confirmed cases of HIV infection in the Russian Federation, and this number has since exceeded 1.5 million as of April 1, 2022. Eye diseases associated with HIV occur in 70–80 % of patients [1]. Anterior segment lesions are present in approximately 50 % of these patients, with infectious corneal pathology accounting for 5 % of cases. Corneal ulcers are significantly more common in HIV-infected patients than in the general population, due to exacerbation of concurrent infectious diseases in the context of immunodeficiency [2]. A thorough understanding of the clinical manifestations of corneal ulcers is essential for the differential diagnosis and management of HIV-infected patients with this condition. The treatment of corneal ulcers in individuals with HIV is a particularly difficult task, as the impaired immune system and concurrent antiretroviral therapy can affect the effectiveness of conservative measures and the outcomes of surgical interventions [3].

THE AIM OF THE STUDY

A case report of a corneal ulcer with perforation as the first sign of HIV infection manifestation.

MATERIALS AND METHODS

A clinical case of a corneal ulcer with perforation in a 47-year-old HIV-infected woman is presented. The patient has given voluntary informed consent for the study. Upon admission, the patient reported decreased vision, pain, redness, and lacrimation of the left eye, as well as joint pain and swelling of the fingers. According to her anamnesis, these symptoms suddenly appeared one month ago, and she had been treated with antibacterial eye drops (levofloxacin 0.5 % (Signicef®)) and anti-inflammatory eye drops (diclofenac 0.1 % (Diclo-F®)). However, she did not consult a doctor during this time. At the time of the examination, the patient's general condition was satisfactory. The visometry results were as follows: OD = 0.6 sph + 0.25 = 1.0 and OS = counting fingers at 10 cm n/c. Biomicroscopic examination of the visual acuity (OS): mixed injection. At the limbus at 14 o'clock, there is an ulcerative lesion with a perforation measuring approximately 2 mm. The iris is inserted into this defect. The anterior chamber is uneven, and the iris is swollen and hyperemic. The relief is blurred. The pupil is of irregular shape, and the reaction to light is slow. Based on the results of the objective examination, the following diagnosis has been made: corneal ulcer with perforation and uveitis in the left eye. Urgent surgical treatment is recommended for the patient. As preoperative preparation, anti-inflammatory and antibacterial therapy has been prescribed (ceftriaxone 1 g once daily intravenously and 1 % tetracycline ointment and picloxidine 0.05 % Vitabact®), which has yielded positive results within 8 hours of administration. The exudate in the area of the pupil has resolved. Immediately prior to surgery, the visual acuity of OS = 0.7. The location of the ulcer near the limbus and the absence of loose infiltration at its edges, as well as the high visual function, determined the need for a gentle surgical approach. This approach involved iris repositioning without iridectomy and applying three 8–0 corneolimbal sutures without conjunctival dissection. At the time of the surgery, the patient's HIV status was not known. Subconjunctival injections of 4 % gentamicin (0.3 ml) and 0.4 % dexamethasone (0.3 ml) were administered, as well as conjunctival instillations of 0.5 % levofloxacin and 1 % tetracycline ointment, were administered. In the postoperative period, the patient was treated with intravenous antibacterial medications: ceftriaxone 1 g once daily, instillations of an antiseptic solution (picloxidine 0.05 % Vitabact® 4 times daily), an anti-inflammatory medication (diclofenac 0.1 % (Diclo-F®) 4 times daily). Additionally, 1 % tetracycline ointment was placed in the conjunctival cavity overnight, and 5 % eye gel containing dexpanthenol (Korneregel®) was applied hourly during the day. The following day after surgery, a positive result for the HIV-1 antibody/antigen p24 was determined using the ELISA method.

RESULTS AND DISCUSSION

During the course of treatment, the patient experienced an improvement in their condition. The inflammation had subsided, as evidenced by the following signs: conjunctival hyperemia, iris calmness, pupil roundness (3.5 mm diameter), light reaction sluggishness, and sutures clean and intact. On day 3 after surgery, a synechia had formed in the area of the sutured ulcer. Phenylephrine 5.0 % and Tropicamide 0.8 % eye drops (Midrimax®) were prescribed twice a day for four days. At the time of discharge, uncorrected VIS OS was

0.5. Biomicroscopic examination (OS) revealed clean and intact sutures, mild conjunctival congestion, clear cornea, and calm iris. The patient was discharged in improved condition with the following recommendations for outpatient treatment: 5 % dexpanthenol gel (Korneregel®), 0.05 % picloxidine drops (Piktorid-SOLO-Pharm®), 0.1 % nepafenac, and human recombinant interferon alpha-2B (Oftalmoferon®). The patient was advised to follow up with the ophthalmologist in the local clinic at regular intervals. The next appointment was scheduled in 10 days. VIS OS = 0.7 is not corrected. Objectively, the OS is calm and a scar is forming at the site of the perforation.

This clinical case demonstrates the observation of a patient infected with HIV who developed an acute corneal ulceration with perforation. The patient presented with signs of fibrinous-plastic iridocyclitis, but no symptoms of endophthalmitis were observed, as confirmed through ophthalmoscopic examination. Examination revealed a unilateral corneal ulcer, with white infiltration and dense edges, located at the superior-outer limbus with a perforation of the cornea. Due to the absence of the characteristic clinical features of a creeping corneal ulcer with undermined edges and purulent discharge, bacterial etiology was ruled out. Positive results in terms of rapid healing of the corneal lesion with standard antibiotic and anti-inflammatory treatment in the postoperative period allowed us to rule out a herpes virus etiology.

In this patient, a differential diagnosis was made with autoimmune inflammatory lesions of the cornea based on the localization of the ulcer at the periphery and the presence of joint syndrome. More than half of cases of peripheral corneal ulcers are associated with systemic autoimmune connective tissue diseases, such as rheumatoid arthritis, systemic lupus erythematosus, and Wegener's granulomatous vasculitis [4, 5]. The clinical features characteristics of peripheral corneal ulcers associated with autoimmune conditions include bilateral lesions, mild infiltration and perifocal edema of the cornea, formation of an oval or crescent-shaped epithelial and stromal defect at a distance of 2–4 mm from the limbus, rapid corneal lysis and perforation, perilimbic arteritis and scleritis, and often accompanying anterior uveitis. The ulcer may present with a peripheral infiltrate extending circumferentially toward the limbus [6, 7]. Most patients with this condition have a known history of autoimmune disease. If there is no such history, a clinical blood test (ESR) should be conducted, followed by consultation with a medical professional to identify any systemic signs of autoimmune activity, as well as specific blood tests for rheumatoid factor, C-reactive protein, anti-neutrophil cytoplasmic antibodies, antinuclear antibodies, and circulating immune complexes. In this patient's case, there were no indications of a systemic autoimmune disorder, and her ESR levels were within the normal range. A consultation was held with a doctor, and the diagnosis of polyosteoarthritis was confirmed.

According to current understanding, in the normally immunologically inactive cornea, activation of lymphocytes and interferons may occur under the influence of both endogenous and exogenous factors, including HIV [8]. This can lead to thinning of the cornea and formation of an ulcerative lesion, with systemic immunodeficiency contributing to the rapid development of a secondary infection and increasing the risk of complications, such as endophthalmitis. In the international literature, there have been reports of cases of spontaneous, sterile thinning of the corneal stroma and silent perforation due to rupture of Descemet's membrane in HIV-positive patients [8, 9]. Therefore, acute occurring corneal ulcers require further evaluation to detect systemic conditions, such as HIV infection. It should be noted that in this patient population, the pathological process is often bilateral and the corneal lesion is typically located in the inferior nasal or inferior temporal quadrant. In the clinical case presented, the lesion was located in the superior temporal quadrant, which contradicts this hypothesis. Therefore, it is possible that immunodeficiency is the cause of corneal thinning and perforation, although the exact mechanism remains unknown.

The patient did not have any objective systemic signs of HIV-associated immunodeficiency, and she had not been taking any medications for the underlying condition. The patient's age and duration of illness were notable. A sudden corneal ulcer in a young patient with no general risk factors for infectious keratitis could be a sign of HIV infection. In such a situation, quick surgical intervention and intensive medical treatment are essential for achieving good results. In this case, careful adaptation of the defect edges during suturing and their proximity to the vascular area of the limbus helped prevent additional conjunctival damage and the formation of severe vascular opacity. This approach was justified due to the position of the defect near the limbus in the upper-lateral quadrant of the cornea and its size up to 4 mm, eliminating the need for a corneal transplantation. Among other surgical options for this clinical situation, amniotic membrane transplantation could be considered. Timely surgical intervention, in combination with systemic and topical drug therapy using antibiotics and anti-inflammatory drugs, resulted in a satisfactory outcome, sealing the corneal defect and restoring the patient's visual function.

CONCLUSION

A perforated corneal ulcer, without any known risk factors, may be the initial manifestation of HIV infection. The treatment is tailored to the individual and depends on the etiology, size, and location of the ulcer. The patient's HIV-positive status and lack of therapy for the underlying condition did not adversely affect the healing of the ulcer in the postoperative period.

Conflicts of interest

No potential conflict of interest relevant to this article reported.

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