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Case Report Open Access

Eyelids Necrotizing Fasciitis in Children

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Abstract

Purpose: Two cases of eyelids Necrotizing Fasciitis in children were presented. The first one with chicken pox, and the second was previously healthy.

Design: Interventional Report cases.

Methods: Two cases of eyelids Necrotizing Fasciitis in children were studied. The first case was a 7 years old girl who presented a necrotizing fasciitis in superior and inferior eyelids with a serious toxic shock as a complication of the chicken pox. Parenteral antibiotic treatment was not enough to stop the necrotizing process and surgical debriding was needed for the gangrenous tissues. In the eyelid culture Streptococcus pyogenes grew. A free skin graft was implanted to the inferior eyelid. The second case was presented in a 6 months old girl, who developed necrotizing fasciitis of her lower left eyelid without any trauma antecedent. The ocular and blood cultures did not show any microorganism growth. An appropriate antibiotic coverage and management of systemic manifestations leads to a fast recovering; even though the developed necrosis demanded surgical debriding and a retroauricular free skin graft was performed later.

Keywords: Necrotizing; Fasciitis; Eyelids; Infection

Introduction

The Necrotizing Fasciitis (NF) is a severe and uncommon bacterial infection that involves all the subcutaneous tissue, specially the fascia, fat tissue, muscles and necrotizes the overlying skin [1,2] occurring most commonly in the lower extremities, trunk, and it rarely involves the neck and head [3,4]. In the medial - facial and periorbital infections, it is noticeable that a trauma history might be absent, or such a trauma cold have been minimal. The facial involvement is very infrequent due to the excellent blood supply in the area. These infections are caused by a wide variety of organisms, which includes Gram -positive and Gram - negative bacteria, either aerobic or anaerobic [2]. The early recognition and the fast and aggressive treatment, which includes surgery, are critical to prevent the severe complications [5] and the survival of the patient [2,3]. Two cases of eyelids Necrotizing Fasciitis in children are presented. The first one with a complication of chicken pox and the second case with a cellulitis history without any apparent trauma.

Case Reports

Case 1

A 7 years old girl, previously healthy; She is accepted at the pediatrics emergency with a disease time of 6 days, characterized by facial eritemo - papular- vesicular injuries which were grown toward the abdomen, chest and the limbs. At the fourth day of the disease, there is a growing in the volume at the left eyelid with acute pain and high fever. She is accepted with a diagnosis of chicken pox, complicated with left peri-orbital cellulitis. At the moment of the physical examination, the patient had a fever: 39°C, the upper and lower eyelids of the left eye were eritemous and swelling. A treatment was begun with intravenous (IV) oxacillin (Prostafilina, Bristol Myers, Venezuela) 1gr per each 6hrs and IV ketoprofen (Ketoprofen, Biotech, Venezuela) 20 mg e/8 hrs to control pain. 24 hours later, her condition was deteriorated with a renal and cardiac- respiratory failure. The lab tests showed anemia (9,8 gr/dl), leukocytosys (22.100 mm^3), neutrophilia (84%) and thrombocytopenia (82 x 109/l), Westergreen erythrocyte sedimentation rate (30 mm^3 x h), the C reactive protein (12.8 mg%). The chest X-ray showed a bilateral, interstitial infiltrate and cardiomegalia, and the echocardiogram reported a mild pericardial leak. The treatment is changed from antibiotics to IV clindamicyn phosphate (Dalacin, Pfizer, Venezuela) 40 mg/kg/day, IV cefepime hydrochloride (Maxipime, Bristol Myers Squibb, Venezuela) 150 mg/kg/day, IV acyclovir (Zovirax, GlaxoSmithKline) 250 mg/m^2 body surface/day and topical gentamicyn sulphate (Solgenta ointment, L.O Oftalmi, Venezuela). At the third day in the hospital and in spite of the treatment, the eyelid area continue getting worse and in the eyelid a serohematic blister was formed and a violet macula on the skin. The patient is evaluated at the 96 hours by ophthalmology and a mild violet lesion is found as a hard plaque in both left eyelids, with a little secretion and painful when touching. Except for the incapacity to open the eyelids due to the swelling, the eye examination was normal including the eye sight 20/20 and with no restriction in the eye motility. Ketoprofen was suspended.

At the 7^{th} day in the hospital, a surgical debriding was performed. The necrotic tissue was completely removed with a cut of the orbicular muscle part, upper as lower eyelids (Figure 1A). Three days later, the general condition of the patient gradually improved, and the swollen of the eyelids diminished. The eyelids culture was positive for *Streptococcus pyogenes*. The blood culture: negative. After 15 days, of evolution, based on IV antibiotics and topic care in the wound area, all the signs for an active infection disappeared. The necrotic areas in the eyelids spontaneously began to granulate with an early development of palpebral retraction and lagophthalmos. One month after the surgical debriding a reconstruction of the lower eyelid was performed, which involved only removal of the granulate tissue and a retroarticular graft

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in the surgical defect. It was not necessary a reconstruction surgery for the upper eyelid, because it granulated perfectly (Figure 1 B).

Case 2

A 6 months old girl is accepted at the pediatric emergency room with a report on a 4 days disease, characterized by inferior eyelid reddish and edema in the left eye, with a fever. She has been seen in another hospital where she received a treatment IV with oxacillin and cloramphenicol. At the second day of the disease, the eyelid lesion has a necrotic appearance and vomiting and diarrhea began; she is accepted with a diagnosis of peri orbital cellulitis and mild dehydration. The child was born from a normal pregnancy, 3.2 kg weight at birth. The physical exam indicated 37°C temperature and 6.6 kg weight.

The inferior eyelid presented a hard violet lesion with a yellowish secretion. Treatment was initiated with IV oxacillin, IV ceftazidima pentahydrate (Fortum, GlaxoSmithKline) 150 mg/kg/e/day, topical tobramycin (Tobrasol ointment, L.O Oftalmi) four times daily, IV ketoprofen for the pain and hydroelectrolitic solutions.

The Lab tests at the moment when she was accepted at the hospital revealed: anemia (9.7 g/dl) leukocytosys (13,500 mm^3), hypernatremia (152.5 mg/dl) and hypocalcaemia (8.3 mg/dl). At the third day as inpatient, she was evaluated by ophthalmology where a lesion with a scab is found on the inferior eyelid, left eye, with an eritemo and swelling around and a scarce purulent secretion (Figure 2A). The ophthalmologic exam was normal (VA: 20/20) including eye sight and ocular motility. It was decided to perform a surgical debriding and to stop the ketoprofen. Six days after admission, and under general anesthesia the surgical procedure was performed, during this procedure pieces of black scab were removed from the inferior eyelid. These areas were cleaned with povidine and saline solutions. Tissue samples were taken for a culture, which shown no growing at all. Other samples from the secretion and the blood culture showed no microorganisms growth. The general conditions of the patient improved gradually in general and regarding her eyelid lesion. Three months later, a surgical reconstruction of the eyelid was performed with a removal of the granulated tissue and a retroauricular graft in the surgical defect (Figure 2B).

Results

More than 4 years later after both cases, the patients are free of infections and have a good cosmetic result after the skin graft.

Discussion

The term Necrotizing Fasciitis was introduced in 1952 to enhance the features of the necrotic fascia with extension of the infection along the face lines with no specificity regarding the bacterial etiology [3]. There is a classification based on the etiological agents, clinical manifestations, and predisposing factors. The Type I is presented as an ulcer that is limited to the superior fascia, with a slow extension, and gas is often observed in the subcutaneous tissue. It might be a mild systemic affection. They are generally caused by *Staphylococcus aureus* and a kind of *Clostridium sp*. The Type II shows destruction of the subcutaneous cellular tissue and the fascia, severe systemic affection, fast progression necrosis, shock, gangrene and multi organs failure. In this group, the etiological agents are Gram negative bacilli, anaerobic, enterococcus and Beta hemolytic streptococcus group A.

Most of the palpebral necrosis are commonly caused by the Beta hemolytic streptococcus [1,3,6-7] and species of just staphylococcus

Figure 1(A): Clinical photograph taken 5 days alter admission in the ER. In the left eye, edema, border eritemo, scars and purulent material discharge can be observed in both eyelids. **(B):** Clinical photograph following post surgical treatment.

Figure 2(A): Clinical photograph taken 4 days after admission. In the left eye a black scab, eritemo borders and purulent material drainage can be observed. **(B):** Clinical photograph following oculoplastic excision and repair.

alone or combined with other bacteria [1,3] Other organism that cause the disease are: *Pseudomona aeruginosa* [8], *Pseudomona malei, rickettsia, anthrax, Corynebacterium diphtheria* [9], *Clostridium hastiforme* [10], *Cryptococcus neoformans* [11].

The NF may develop in all age patients and has no predilection regarding gender or race, but mostly affects adults. The peri orbital localization is exceptional in children. This infection usually develops very fast, 2 to 4 days after the traumatic event and progress really quickly [2,4,8]. At the beginning, a pale red, swollen and hurtful skin is appreciated.

These changes in the skin color progress fast from a reddish color to a blue - gray one, a bulla is formed and the real necrosis [2]. Skin gangrene is developed 4 to 5 days later, which falls due to an underlying suppuration near the eighth to the tenth day. The involved area becomes anesthetic due to the destruction of the skin nerves that pass through the superficial fascia. The patients are toxic with a low to mild fever.

The trauma, including lacerations, minor traumas [5-6,12-13], bug bites [14], hypodermic needles [3], are the most common factors for initiating the disease. Other elements that might launch the infection are: blepharoplasty [15], conjunctival dacryocystorhinostomy [16], acute dacryocystitis [4], sinus endoscopic surgery [17], injuries caused with a non sharp object and wood pieces [11] occasionally the disease might be present with no apparent cause or spontaneously [4,17] or even in previously healthy people [18].

Among the predisposing factors that have been reported, there are including: arteriosclerosis, metastatic cancer [7], polymyositis [3], rheumatoid arthritis [2], diabetes [3,7], intravenous drugs abuse and post delivery conditions [3], malnutrition [8], non steroid anti inflammatory drugs [19,20], sudden purpura [19], corticosteroids [21], alcoholism [1,3,5,7,13], AIDS [22] , and chicken pox [9,19,20].

Our first case, a girl with chicken pox; The chicken pox has shown being one of the most frequent diseases that provides a predisposition to the burst of this kind of infections. We know that the chicken pox is a viral infection worldwide, very common during childhood, usually in children between 5 to 9 years old. It is noticeable that it occurs in

susceptible people with get in contact with the sick person through the breathing secretions and/or the fluids from the skin lesions. The skin and soft tissues infections are mainly caused by beta hemolytic streptococcus Group A and staphylococcus aureus which causes erysipelas, impetigo, cellulitis, abscess and necrotizing fasciitis.

The NF related to the Chicken pox generally presents between the third and the seventh day from the burst of the disease, with a fever higher than 38.5ºC, intense pain, eritemo and edema located as it was in our first case. At the beginning, it might be confused with cellulites and with torpid evolution and the compromise of the patient's state the diagnosis of NF is made. Systemic failures are common in less than 24 hours. The patient is febrile, and shows evidence of cellulitis that gets worse. The progressive infection helps the diagnosis. The clinic manifestations, the surgical debriding for the treatment and the microbiology of the affected tissues are definitive. The clinical diagnosis is made through the findings of eritemo, pain, and edema, later the violet lesion appears, serum - hematic flictena and finally necrotic lesions. Some reports said that the administration of non steroid anti inflammatory drugs in a chicken pox framework might enhance the development of NF [20] with toxic shock and renal failure. Our two cases at the moment of acceptance in the Emergency Room (ER), non steroid anti inflammatory drugs such as ketoprofen, were given for pain relief. We do not know if this drug helped to the torpid conditions. Anyway, this possibility should not be excluded when using for NF cases.

The peri ocular involvement may be associated to surgery or accidental trauma [2] In those cases where there are not know antecedents for trauma, also denominated without apparent cause, as in our second case, it has been proposed that the entrance is through the conjunctiva with the pathogen organism reaching the anterior facial areas via lymphatic drainage [2] even in this second case no germ was cultured, and it was treated as a kind of streptococcus sp, because clinically and epidemiologically they are similar to what was described in other reports for NF due to streptococcus, besides they are pathogens known in the conjunctiva.

In conclusion, in recent years, a burst of necrotizing fasciitis has been seen. This infection may be accompanied by toxic shock syndrome and frequently affects young, healthy people. The periocular tissues may be necrotizing processes sites. The treatment must be based on supporting the vital functions such as respiratory, renal and hemodynamic through the hydroelectrolitic reposition and early intervention surgical procedures which consists in the debriding of the necrotic tissues, draining of the abscess tissues, using antibiotics as a intravenous therapy and care in the usage of the non steroid anti inflammatory drugs.

Conclusions

The necrotizing fasciitis in the eyelids progress quickly. The early diagnosis, the early administration of intravenous antibiotics, monitoring and hemodynamic stabilization, and the aggressive debriding process are of prime importance in the patient's life, as well as the conservative use of the non steroid anti - inflammatory medication.

Competing Interests

The authors declare that they have no competing interests.

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