



A case of neonatal acute dacryocystitis developing preseptal cellulitis and lacrimal abscess

Yenidoğanda preseptal selülit ve lakrimal abse gelişen akut dakriyosistit olgusu

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Abstract

Acute dacryocystitis is an inflammation of the lacrimal sac. The condition often occurs in neonatal period due to the underlying nasolacrimal duct obstruction. Manifesting itself with swelling in the inner canthal region fullness, redness, and sensitivity, acute dacryocystitis is a serious illness in the newborn period. If infection is not treated effectively with parenteral antibiotics, this problem may progress to preseptal cellulitis, orbital abscess, brain abscess or sepsis. These patients should be hospitalised and parenteral antibiotics should be initiated immediately. These patients should also be closely monitored for possible complications. Necessary intervention for the underlying nasolacrimal duct obstruction is recommended to be carried out after infection has resolved. In this paper, we present a case of acute dacryocystitis which progressed to lacrimal abscess and preseptal cellulitis due to delay in systemic therapy.

Keywords: Acute Dacryocystitis; Preseptal Cellulitis; Newborn.

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Öz

Akut dakriyosistit gözyaşı kesesinin iltihabıdır. Yenidoğan döneminde sıklıkla altta yatan nazolakrimal kanal tıkanıklığına bağlı gelişebilmektedir. İç kantal bölgede şişlik, kızarıklık ve hassasiyetle ani başlayan akut dakriyosistit yenidoğan döneminde ciddi bir hastalıktır. Enfeksiyon parenteral antibiyotiklerle etkin bir şekilde tedavi edilmezse preseptal selülit, orbital apse, beyin apsesi ve sepsise ilerleyebilir. Bu hastalar hospitalize edilmeli parenteral antibiyotikler başlanmalı ve olası komplikasyonlar yönünden yakın takip edilmelidir. Altta yatan nazolakrimal kanal tıkanıklığına yönelik gerekli müdahalenin enfeksiyon yatıştıktan sonra yapılması önerilmektedir. Bu yazıda sistemik tedavide gecikildiği için preseptal selülit ve lakrimal kese apsesine ilerlemiş olan bir akut dakriyosistit olgusu sunulmuştur.

Anahtar Kelimeler: Akut Dakriyosistit; Preseptal Selülit; Yenidoğan.

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INTRODUCTION

After being produced by the glands in the upper outer part of the eyeball, under the eyelids (palpebral and orbital lacrimal glands), and in the conjunctiva (Wolfring and Krause glands) and moistening the surfaces of the conjunctiva and cornea, teardrops are first drained to the lacrimal sac through the canaliculi found in the inner part of the upper and lower eyelids and then to the lower nasal concha through the nasolacrimal duct (1). Within the duct, there are valves that allow unidirectional flow to the nasal concha. The intrauterine formation of the nasolacrimal duct starts from the proximal and opening of the distal (nasal) region drainage (canalization) is completed in the 7th-9th gestational months (2). Although inadequate drainage and congestion obstruction can settle at any level along the location of the valves, they most commonly take place in the distal end of the duct (Hasner's valve). Nasolacrimal duct obstruction can be seen more often in craniofacial abnormalities and Down syndrome (3, 4). Studies show that 6-30% of the asymptomatic newborns have blocked nasolacrimal duct at birth (4, 5). However, congestion recovers spontaneously within the first weeks of birth and the rate of newborns with symptoms is very low (6, 7). The most common symptom is epiphora that develops secondary to mechanical obstruction and, with conservative treatment and spontaneous recovery, nasolacrimal duct is treated (4, 6). Congestion and tear stasis create a favorable environment for bacterial overgrowth and may lead to acute dacryocystitis (8). With a sudden onset of swelling, redness, and sensitivity in the inner canthal area, acute dacryocystitis is a serious illness in the newborn period. If the aggressive treatment of infections with parenteral antibiotics fails, it can cause bacteremia and sepsis and may even spread over the preceptal region by penetrating through the lacrimal fascia as well as over the orbit and cavernous sinus by penetrating through the orbital septum (9, 10).

In this paper, we present the case of an acute dacryocystitis patient whose dacryocystitis had advanced into the periorbital cellulitis causing lacrimal sac abscess due to inappropriate treatment.

CASE REPORT

Our case was a newborn baby who was delivered by normal vaginal delivery with a birth weight of 2500g in

the 39 gestational week from a 21-year-old mother in her second pregnancy. On the third day after birth and in the routine follow-up examination, the newborn was suggested to use 3% Tobramycin eye drops four times a day due to watering and ocular discharge in both eyes. After the first week and in addition to the existing complaints, there was gradually increasing swelling in the lower right eyelid. After the onset of this complaint, the patient was applied eye drops containing 1% Fusidic acid and dexamethasone with a dosage of one drop twice a day. With increased swelling and redness in the eye despite the regular use of medication for more than a week, the patient was hospitalized with a preliminary diagnosis of acute dacryocystitis and periorbital cellulitis on the postnatal day 18.

The patient's body weight was 2460 g (3p); height was 51 cm (10-25p) with a head circumference of 35.2 cm (10-25p); the axillary body temperature was 36.9°C; the patient had a relaxed breathing relaxed and a heart rate of 160 per minute. Yet, the baby was restless and agitated. In the lower right eyelid, there was a 5x6 cm abscess-like tender swelling with fluctuation and redness (Figure A). The right eyelid could not be opened. Abdominal and genitourinary system examinations were normal. The newborn reflexes were prompt but sucking reflex was poor. The laboratory examination results were as follows: white blood cell count: 25,900/mL; hemoglobin: 13.9 g/dL; hematocrits: 35.8%; platelet count: 709 000/mL; and C-reactive protein: 6.67 mg/L. The patient's blood cultures were obtained. We applied cefotaxime and teicoplanin through intravenous infusion. The eyelid not be opened easily; thinking that this could facilitate bacteria, we did not force the structures or apply conjunctival swabs. The patient was referred to the Department of Ophthalmology while the antibiotic therapy continued. We decided to administer abscess drainage if the current treatment had failed. On the third day of the treatment, there was marked reduction in the abscess (Figure B). On the seventh day (Figure C), the abscess resolved completely and there was no need to apply drainage. We did not use topical treatment. Blood cultures were negative. On the tenth day of the parenteral antibiotic therapy, the patient was discharged in good health (Figure D). There were no dacryocystitis attacks within the six-months of follow-ups.



Figures (A): The view of the patient on the day of the administration of the antibiotics treatment; **(B):** the third day of the treatment; **(C):** the seventh day of the treatment; **(D):** the tenth day of the treatment.

DISCUSSION

Acute dacryocystitis is an inflammatory condition of the lacrimal sac. Almost all patients developing acute dacryocystitis in the neonatal period have nasolacrimal duct obstruction as the underlying cause of their condition. Nasolacrimal duct is formed by the canalisation of epithelial cord rooted in the ectoderm located in the naso-optic fissure in the intra-uterine period. This process is not complete before the 8th-9th months of pregnancy and congestion yerine canalization ifadesi daha uygun olabilir in the distal end of the canal is not uncommon at birth. However, most newborns are asymptomatic and the channel can be cleared spontaneously within the first months of life. 6-20% of newborns with nasolacrimal duct obstruction at birth are symptomatic in the newborn period or infancy (6, 7). The most common symptom is tears stasis induced epiphora. In case of massage and burring in the lacrimal sac, many patients show improvements before one year of age with conservative treatment modalities including antibiotic eye drops (4, 6). *Bu cümlelerin çevirisi kontrol edilmeli* In case of epifora many patients show improvements before one year of age with conservative treatment modalities including massage in the lacrimal sac and treatment conjunctivitis antibiotic eye drops (4, 6). Some centres may recommend probing of the nasolacrimal duct to patients in early period (11). Episodes of conjunctivitis, which are formed by the accumulation of staphylococcal exotoxins located in the normal flora on the eye surface and toxic debris, are not uncommon in these patients. In our patient, too, and prior to the onset of dacryocystitis, there were signs compatible with conjunctivitis. Inability to drain tears, along with stasis, can cause bacterial overgrowth in the lacrimal sac as well as dacryocystitis. Dacryocystitis, which may progress in a chronic and slow way in the adults, may manifest itself in an acute and rapid way in newborns due to the underdeveloped immune system. In these cases, the lacrimal sac is swollen and tender with an erythematous skin over it. As it was the case in our patient, acute dacryocystitis may advance to cause lacrimal sac abscess as a result of the delay in intravenous antibiotic therapy (9). The abscess can commonly lead to fistulas towards the skin (12).

The skin on the lacrimal sac in our patient was quite tense and thin at the time of hospitalisation. A few more days delay in treatment could result in possible skin fistula. Whether the fistula to the skin improves spontaneously or through incision cuts aiming at abscess drainage may not prevent the may be development of chronic fistulas (13). Therefore, drainage of the lacrimal sac abscesses are applied by probing of the nasolacrimal duct or needle aspiration on the skin. In our case and following an antibiotics treatment of a few days, we planned to administer drainage by using probing of the nasolacrimal duct. Only on the third day of treatment did we observe marked reduction in the abscess (Figure B). We thought that the nasolacrimal duct opened spontaneously and that the abscess content was drained into the lower nasal concha because there was no flow from the inner canthal area. Sometimes infection

exceeds the front fascia of the lacrimal sac and spreads around the preseptal soft tissue causing preseptal cellulitis. Preseptal cellulitis is the first stage of orbital infections in which infection has not yet passed beyond the orbital septum. If the infection exceeds the orbital septum, which involves extending of the infection towards the edges of the upper and lower eyelids in the periosteum of the orbital bones, orbital cellulitis and orbital abscess may develop (14). After day 3 of the treatment, our patient had comfortable eye movements with no proptosis. Therefore, we did not consider orbital infection or advanced imaging.

Blood culture positivity was reported to be 22.7% in newborns with acute dacryocystitis (15). However, we did not observe positivity in blood cultures during hospitalisation. The most commonly isolated organisms in the abscess materials or on swab cultures are staphylococcus aureus, streptococcus pneumonia, and haemophilus influenzae (16, 17). We preferred cefotaxime and teicoplanin as treatment options in our patient. The recommended treatment in acute dacryocystitis is surgery after allayment of infection with antibiotics (15). Here, surgery refers to probing of the nasolacrimal duct surgery under topical or general anaesthesia, probing with silicone tubes, or, in extreme cases, dacryocystorhinostomy.

It can be concluded that acute dacryocystitis a serious problem in neonatal period. In these patients, practitioners should not waste time with topical or oral antibiotics but should hospitalise patients, initiate parenteral antibiotics, and monitor patients for possible complications. Probing of the nasolacrimal duct may be preferred for the obstruction of the nasolacrimal duct after the allayment subside of infection.

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