

Neonatal orbital abscess

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Orbital complications due to ethmoiditis are rare in neonates. A case of orbital abscess due to acute ethmoiditis in a 28-day-old girl is presented. A Successful outcome was achieved following antimicrobial therapy alone; spontaneous drainage of the abscess occurred from the lower lid without the need for surgery. From this case report, we intend to emphasize on eyelid retraction as a sign of neonatal orbital abscess, and to review all the available literature of similar cases.

Key words: Eyelid retraction, orbital infection, orbital neonatal abscess, neonatal abscess

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Neonatal orbital abscess is extremely rare, it may be caused by dacryocystitis,^[1-3] tooth bud abscess,^[4] and ethmoidal sinusitis. Poor outcome such as blindness, intracranial complications, or even death has been reported.^[1,5] Surgical drainage is generally recommended in cases of subperiosteal or intraorbital abscess.^[1] However, some reports have documented CT evidence of subperiosteal orbital abscesses that was not found at the time of surgery, and it was suggested that the condition might be treated successfully by antibiotics alone.^[6]

Case Report

A 28-days-old female, a product of normal vaginal delivery, weight (3.5 KG), presented with 2 days history of severe right eye proptosis, fever (100.6 F) following an upper respiratory tract infection. The baby was on breast feeding since birth. No maternal history of sexual transmitted disease, and the pregnancy was uneventful.

Ocular examination showed severe right eye proptosis, minimal swelling of both upper and lower eyelids [Fig. 1]. There was extra-ocular motility restriction in all gazes. She had normal pupil and fundus exams. CT scan showed a poorly-defined, retrobulbar, slightly hypodense mass extending to the preseptal space, displacing the right medial rectus and reaching up to the superior rectus. The ethmoidal air spaces were inflamed. [Fig. 2] White blood cell count was (19,200/mm³). Blood culture was negative for bacteria.

A diagnosis of right orbital cellulites with a medial orbital abscess was made, and the patient was started on intravenous cefotaxime, ampicillin, and metronidazole in anticipation for surgical intervention. However, spontaneous drainage occurred prior to surgery. Proptosis of the right eye resolved in the following 5 days along with the fever.

Cultures were positive for *Staphylococcus aureus* sensitive to methicillin. On the 6th day, motility and the upper eyelid retraction improved tremendously [Fig. 3]. After 14 days of intravenous antibiotics, the abscess completely resolved, along with the eyelid retraction [Fig. 4].

Comments

Neonatal orbital abscess is extremely rare, it may be caused by dacryocystitis,^[1-3] tooth bud abscess,^[4] and ethmoidal sinusitis. Eighteen cases are summarized in [Table 1].

The number one cause of orbital abscess was ethmoiditis (confirmed in 7 cases by CT), congenital Dacryocystitis (3 cases), and tooth bud infection (1 case).

Staphylococcus aureus was virtually isolated from all cases, except for case 5; diplococcus pneumonia was isolated, the case is atypical as the biopsy showed a choristoma-like lesion lined by a well-differentiated, multi-layered, non-keratinizing epithelium with goblet cells and filled with inflamed stroma with ectopic lacrimal gland tissue.^[5] *Aspergilous*^[12] and *streptococcus*^[8] has been reported as concomitant infections with *Staphylococcus aureus*. Nevertheless, orbital neonatal abscess secondary to methicillin-resistant *Staphylococcus aureus* (MRSA)

has been reported after 2005, and it needs to be kept in mind while giving the proper antibiotics on presentation.^[3,7,14]

Empirical choice of antibiotics should cover methicillin-resistant *Staphylococcus aureus*; being the most common organism isolated from neonatal orbital abscess after 2005 as shown in [Table 1]; so it will be a good choice to use vancomycin, nafcillin, ampicillin, and first generation cephalosporin. From [Table 1], it is appreciated that many case reports mentioned adding an antibiotic or replacing one because of the culture sensitivity test results; vancomycin being the most common antibiotic added.

Neonatal orbital cellulitis has high probability for abscess formation since 15 cases ended up with abscess (cases 1, 2, 4-7, and 9-17). Case 3 could not be fully characterized; case 8 and 18 were labeled as cellulitis. Surgical treatment is the preferred line of management in the presence of a collection on CT scan; 13 cases out of 15 were treated surgically when abscess formation was suspected or confirmed by CT scan. Our case is unique for the spontaneous drainage, which occurred one day before the scheduled operation date.



Figure 1: 28-day-old girl with right eye proptosis and retraction of EOM

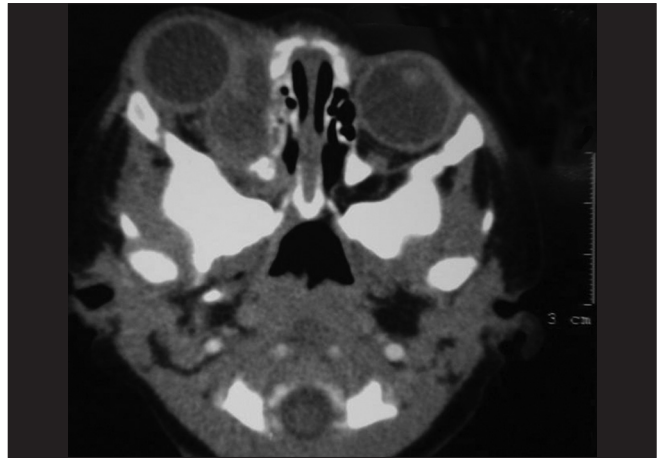


Figure 2: CT scan showed a poorly defined, retrobulbar, slightly hypodense mass extending to the preseptal space, displacing the right medial rectus and reaching up to the superior rectus. Ethmoidal air cells are inflamed



Figure 3: 1 week after treatment. A small sinus is apparent in the lower eyelid, draining of the pus in the orbit



Figure 4: 3 weeks after treatment. Complete resolution of the abscess along with the eyelid retraction

Table 1: The table contains the literature review and summary of 18 neonatal orbital abscesses cases

Author	Year	Cases	Age (days)	Sex	Orbital CT	Cellulitis form	Microorganism identified	Causes	Sepsis	Drainage	Outcome	Eyelid retraction	Extraocular motility	Initial antibiotics*	Final antibiotics*
Burnard ⁹	1959	1	14	F	No	Abscess	Staphy. Aureus	Not established	No	Surgical drainage	Cure	Not established	Full EOM	Chloramphenicol	Penicillin and streptomycin
		2	14	M	No	Abscess	Staphy. Aureus	Not established	Yes	No	Death	Swollen eyelids	Not determined	Penicillin and streptomycin	Same
		3	1	F	No	Not established	None	Not established	No	No	Cure	Mild eyelid swelling	Not determined	Chloramphenicol	Same
Manuszczak ⁵ et al.	1979	4	27	M	No	Abscess	Staphy. Aureus	"Conjunctival malformation"	No	Surgical (open)	Cure	Eyelid lag	Fully restricted	Methicillin, streptomycin.	Same
		5	10	F	No	Abscess	Diplo. Pneumoniae	"Conjunctival Cyst"	No	Surgical (open)	Cure	Not determined	Not determined	Not mentioned	Not mentioned
Saunders and Jones ¹⁰	1993	6	15	F	Yes	Abscess	Staphy. Aureus	Ethmoiditis	No	Surgical (open)	Cure	Not established	Not determined	Flucloxacillin and ceftazidime	Gentamicin added
Wiess et al. ¹	1993	7	5	F	Yes	Abscess	Staphy. Aureus.	Congenital Dacryocystitis	No	Surgical (open)	Cure	Swelling of the eyelid	Not determined	Cefuroxime	Same
Charramendieta and Monasterolo ¹¹	1997	8	10	F	Yes	Cellulitis	Staphy. Aureus	Ethmoiditis	No	No	Cure	Swelling of eyelid	Not determined	Ceftazidime and amikacin	Same
Reddy et al. ¹²	1999	9	10	M	Yes	Abscess	Staphy. Aureus+ Aspergillus	Ethmoiditis	No	Surgical (open)	Cure	Swelling of upper eyelid	Not determined	Cloxacillin, amikacin, amphotericin B	Cloxacillin, Gentamicin
Cruz et al. ⁶	2001	10	21	F	Yes	Abscess	None	Ethmoiditis	No	Surgical (open)	Cure	Not established	Fully restricted	Cephalothin	Same
		11	16	F	Yes	Abscess	Staphy. Aureus	Ethmoiditis	Yes	Spontaneous	Cure	Not determined	Not determined	Oxacillin, amikacin	Same
Klusmann et al. ⁸	2001	12	10	F	Yes	Abscess	Staphy. Aureus, Streptococcus B	Not established	No	Surgical (open)	Cure	Permanent lagophthalmia	Not determined	Ampicillin, oxacillin, gentamycin	Same
Fluss et al. ¹³	2002	13	17	F	Yes	Abscess	Staphy. Aureus	Not established	No	Surgical (open)	Cure	Swelling of the eyelid	Full extraocular motility	Vancomycin and gentamicin	Floxacin
Green and Maun ⁴	2002	14	24	M	Yes	Abscess	Staphy. Aureus	Ethmoid sinuses and tooth buds	Yes	Surgical (open)	Cure	Swelling of eyelid	Restricted EOM	Ampicillin and gentamicin	Vancomycin, gentamicin, cefuroxime
Anari et al. ⁷	2005	15	28	M	Yes	Abscess	MRSA	Ethmoiditis	No	Surgical (open)	Cure	Eyelid swelling	Right sided deviation	Flucloxacillin, cefotaxime	Vancomycin, rifampicin
Rogers et al. ¹⁴	2007	16	13	M	Yes	Abscess	MRSA	Ethmoiditis	No	Endoscopic surgery	Cure	Mild eyelid swelling	Not determined	Clindamycin	Clindamycin
Mohan et al. ²	2007	17	22	F	Yes	Abscess	Staphy. Aureus	Congenital dacryocystitis	No	Open surgery	Cure	Swelling of the eyelid	Not determined	Ceftazidime, amikacin	Ceftazidime, amikacin
Rutai ³	2009	18	12	M	Yes	Cellulitis	MRSA	Congenital dacryocystitis	Yes	No	Cure	Not determined	Not determined	Vancomycin	Same
Present case	2011	19	28	F	Yes	Abscess	Staphy. Aureus	Ethmoiditis	No	Spontaneous	Cure	Eyelid retraction, eyelid swelling	Full restriction of EOM	Cefotaxime, ampicillin and metronidazole	Same

Finally, from [Table 1], it is clear that there is little information on extraocular motility and eyelid retraction as only 4 cases had restriction of extra-ocular motility,^[4-7] and only two had eyelid retraction.^[5,8] It is worth noting that Klusmann^[8] reported permanent lagophthalmia in a 10-day-old neonate, which had some residue after 2 months of treatment. In our case, the girl had eyelid retraction, which resolved spontaneously after successful treatment.

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