Endogenous endophthalmitis due to *Staphylococcus aureus* in a lactating woman

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Endogenous endophthalmitis (EE) is a rare but fulminant intraocular infection that needs prompt recognition and management. Bacteria are the commonest causative organisms and they may colonize the eye secondary to hematogenous spread from a focus anywhere in the body. EE in the peripartum period is an infrequent occurrence with no cases reported to occur secondary to a peurperal mastitis. We report a case of EE due to Staphylococcus aureous in a lactating female and describe its clinical presentation and management.

Key words: Bacterial endophthalmitis, endogenous endophthalmitis, lactation mastitis, *Staphylococcus aureus*

Endogenous endophthalmitis (EE) is a serious ocular infection that occurs secondary to bacterial or fungal organisms that reach the eye via the blood stream.[1] Endogenous bacterial endophthalmitis (EBE) accounts for 2–8% of all cases of endophthalmitis.[1-3] EE during pregnancy and lactation is extremely rare, with a handful of reported cases in literature.[4-6] Management of EE patients in this scenario poses unique challenges – fulminant nature of EE coupled with concern for neonatal safety of systemic and intravitreal drugs.[5] Lactation mastitis (LM) occurs commonly in the first month after childbirth and can progress to puerperal breast abscess with hematogenous dissemination of infection.[7] We report a case of EBE secondary to *Staphylocccus aureus* (SA) in a postpartum lactating woman with mastitis.

Case Report

A 22-year-old lady, who had undergone a normal vaginal delivery 20 days back, presented with sudden diminution of vision of her left eye (OS) since two days. She had delivered a term male child 20 days ago and had no perinatal complications. The patient gave history of pain in her left breast (LB) with high grade fever for the last 5 days. Ocular examination revealed a visual acuity (VA) of perception of light with accurate projection of rays in the OS and 20/20 in the right eye (OD). Extraocular movements and intraocular pressure were normal in both eyes, while the OS had a relative afferent pupillary defect. OS had circumcorneal congestion, 4+ cells and a 2 mm hypopyon in the anterior chamber. Fundus examination showed media clarity of grade 2 with vitreous cells and multifocal yellowish subretinal exudates with overlying hemorrhages in all quadrants [Fig. 1]. OD was unremarkable. Examination of the LB revealed a tender cracked nipple with hypermia around the areola [Fig. 2]. A clinical diagnosis of EE secondary to LM was made; the patient was admitted and pediatric and surgical consultations were sought. Optical coherence tomography (OCT) showed vitreous cells, disorganization of retinal architecture, intraretinal fluid, and hyper-reflective subretinal deposits [Fig. 3a].

A provisional diagnosis of SA-related LM causing EE was made and intravenous amoxicillin + clavulanic acid (1.2 grams thrice a day) was started along with local application of 2% mupirocin on the LB. A vitreous tap was sent for gram stain, KOH mount, and cultures, and OS intravitreal (1 mg/0.1 ml), vancomycin (V), (2.25 mg/0.1 ml), ceftazidime, and (0.4 mg/0.1 ml) dexamethasone (D) were given. Topical 0.5% moxifloxacin, 0.1% betamethasone, and 1% atropine were started. Total leukocyte count (TLC) was 21,000 cells/mm^3, while blood cultures, renal and liver function tests were normal. Vitreous tap showed the presence of gram positive cocci with the growth of SA colonies on culture (sensitive to vancomycin, amoxicillin and ciprofloxacin). After 3 days, the patient was afebrile, had reduction of pain in her LB, TLC decreased to 14,000 cells/mm^3, VA improved to hand motions close to face, and hypopyon had disappeared along with decrease in size of subretinal exudates [Fig. 4a]. Intravitreal V + D injection was repeated. The patient showed improvement with reduction of subretinal exudates and improvement of VA to counting fingers close to face and 20/1200, at 1- and 2-week follow-up, respectively [Fig. 4b and c]. After 2 weeks, TLC had normalized, LM had healed, and the patient was discharged on oral ciprofloxacin (500 mg twice a day). Antibiotics were stopped after 1 month. At 5 months follow-up, VA was 20/400 with absence of ocular inflammation, complete resolution of subretinal exudates, and presence of subretinal fibrosis [Figs. 3b and 4d].

Discussion

EE is defined as infection of the inner coats of the eye that occurs secondary to hematogenous dissemination of

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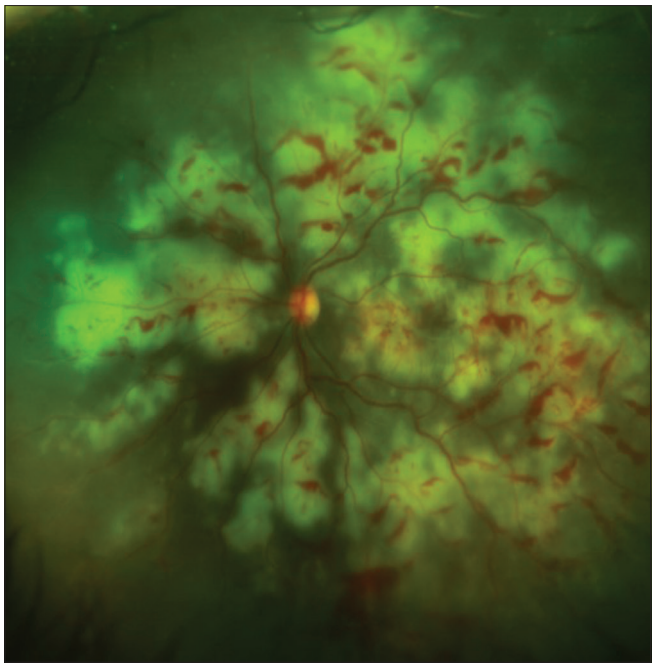

Figure 1: Ultrawide field (UWF) fundus photograph of the left eye (OS) at presentation showing vitreous haze with multifocal yellowish subretinal exudates with overlying retinal hemorrhages in all four quadrants

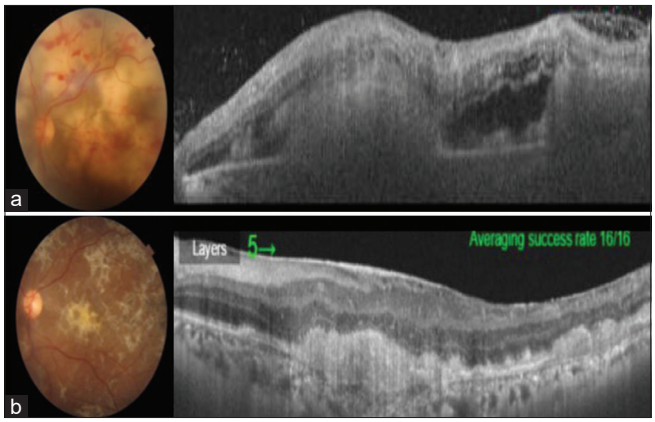

Figure 3: Optical coherence tomography line scan passing through the fovea at presentation showing vitreous cells, disorganization of the retinal architecture, intraretinal and subretinal fluid, and a mound of hyper-reflective subretinal exudates in the macula (a). OCT line scan at 5 months follow-up, showing absence of vitreous cells, partial restoration of inner retinal architecture, and replacement of outer retinal layers by fibrosis in the macula (b)

organisms from anywhere in the body. EBE is the most common cause of EE and accounts for 2–8% of all cases of endophthalmitis.[1,2] Predisposing conditions for EE include diabetes mellitus, indwelling catheters, neutropenia, immunocompromised patients, and patients receiving chemotherapeutic agents.[2,3] Pregnancy and lactation are not associated with increased rates of EE, although anecdotal cases have been reported.[4-6,8,9] Most patients in these cases had a history of septic abortion, manipulation of an intrauterine device or intravenous fluid infusion.[5,8,9] Our patient developed EE in the early postpartum period and had LM with a localized breast abscess. SA is the most common

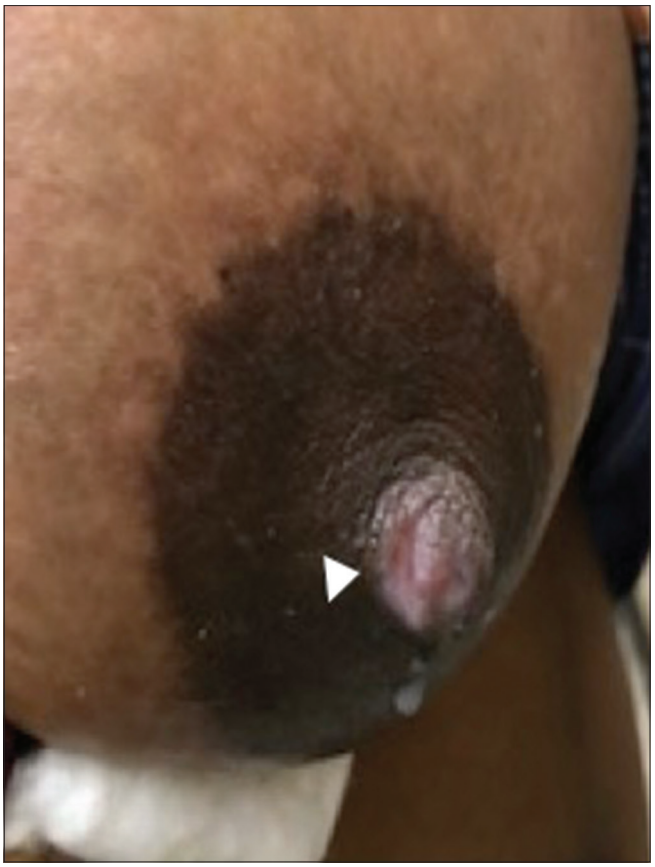

Figure 2: Photograph of the left breast of the patient showing cracked nipple (white arrowhead) and slight hyperemia of the periareolar region, suggestive of mastitis with localized abscess

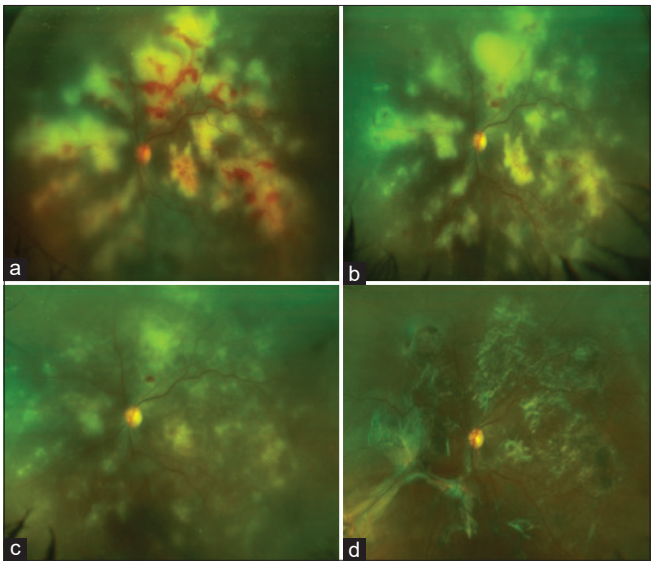

Figure 4: UWF fundus photographs at 3 day follow-up (a) showing slight consolidation of the margins of subretinal exudates, at 1 week (b) and 2 weeks follow-up (c) showing progressive reduction in extent and number of subretinal exudates and hemorrhages. UWF photograph at 5 months follow-up showing completely healed exudates with absence of hemorrhages and multiple areas of subretinal fibrosis (d)

causative organism of LM and although the blood culture in our patient was sterile, vitreous tap grew SA and there was

therapeutic response to anti-SA treatment.[7] A diagnosis of EBE secondary to SA-related LM was thus made.

This case posed multiple challenges, such as atypical presentation of EE in a postpartum female, comcomitant management of LM, and neonatal safety of systemic antibiotics. Flare up of disease activity of NIU occurs in the first 4 months of pregnancy with decrease in activity during late pregnancy and exacerbation during lactation.[10] Exacerbation of activity during lactation is hypothesized to be due to a transient state of immunosuppression – this may have led to increased susceptibility of our patient to develop EBE. Amoxicillin is safe during lactation; however, concerns regarding the use of fluoroquinolones exist as they may cause reversible damage to the articular cartilage in infants.[11] Ciprofloxacin was used in our patient after getting clearance from the pediatrician.

Conclusion

EE in lactation is a rare entity with dismal visual prognosis. Timely diagnosis and aggressive treatment with targeted antibiotics is needed to achieve favorable anatomic outcomes, though functional outcomes remain dismal. LM with abscess formation can cause EBE and lead to severe vision loss despite appropriate treatment.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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