POSTPARTUM ENDOGENOUS CANDIDA ENDOPHTHALMITIS

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Abstract: Candida albicans is the most common pathogen causing intraocular fungal infection. Postpartum endogenous Candida endophthalmitis, however, is extremely rare. We report the case of a 33-year-old postpartum woman who presented with a 5-day history of decreased vision and had a positive blood culture for C. albicans. Fundus examination showed vitreous haze and multiple pre-retinal whitish lesions with indistinct borders. Systemic investigations revealed acute renal failure and cardiomegaly. After treatment with intravenous antifungal therapy, vitrectomy, and intravitreal injection of antimycotics, systemic and intraocular infections were eradicated successfully.

Case Report

A 33-year-old woman with a history of Candida vaginitis, treated with vaginal antifungal suppositories since the second trimester, experienced high fever and chills after a preterm delivery at 33 weeks of gestation. Premature rupture of the membrane with chorioamnionitis was suspected due to cloudy, foul-smelling amniotic fluid noted during parturition and generalized skin rash of the child. However, the amniotic fluid was not cultured or stained. Based on the clinical features, broad-spectrum systemic antibiotics were started for a presumed infection. On postpartum day 3, she was admitted to another local hospital because of persistent puerperal fever. Blood was drawn for culture and intravenous gentamicin and clindamycin were initiated. Three days later, she complained of pain and redness in both eyes. On postpartum day 7, antifungal therapy with oral fluconazole (200 mg/d) was started due to suspected fungal infection. On postpartum day 10, vision became blurred and blood culture yielded Candida albicans. On postpartum day 11, she was referred to our hospital due to Candida sepsis and suspected bilateral endogenous endophthalmitis.

Visual acuity upon presentation measured 6/20 in the right eye and 6/30 in the left. The intraocular pressure was 5
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mmHg in both eyes. Slit-lamp examination disclosed 2+ flare and 3+ cells in the anterior chambers in both eyes. Fundus examination revealed dense vitreous opacity and numerous creamy-white elevated lesions with fluffy borders consistent with Candida endophthalmitis (Fig. 1). A yellowish-white feathery lesion was found in the fovea of the left eye. In addition, leukocytosis and impaired renal function with blood urea nitrogen of 52 mg/dL and creatinine of 3.2 mg/dL were noted. Roentgenography disclosed cardiomegaly with bilateral pleural effusion. Intravenous contrast computerized tomography (CT) of the abdomen showed thrombosis of the right ovarian vein with extension to near the inferior vena cava (Fig. 2A). Thickening of bilateral renal cortices with multiple low-attenuated lesions suggested acute renal infarction as a result of septic embolization of the kidneys (Fig. 2B).

Under the diagnosis of Candida septicemia with bilateral endogenous endophthalmitis and acute renal insufficiency, intravenous antifungal therapy was started. In addition to systemic antifungal therapy, subconjunctival injection of fluconazole (1 µg/0.5 mL) and intravitreal injections of fluconazole (100 µg/0.1 mL) and amphotericin B (5 µg/0.1 mL) were made in both eyes in sequence preoperatively. Topical 0.2% fluconazole, steroid, and 1% atropine were also administered. On hospital day 9 (postpartum day 20), when the fever subsided, vitrectomy and scleral buckling were performed in the left eye. On hospital day 14, the same procedures were performed in the right eye. Amphotericin B (5 µg/0.1 mL) was injected intravitreally immediately after the vitrectomy in both eyes. Two vitreous specimens, one collected by membrane-filter technique and another directly, were obtained from each eye during vitrectomy. Culture of both specimens confirmed the presence of Candida albicans in each eye. After 8 weeks of treatment, renal function improved as evidenced by blood urea nitrogen of 9 mg/dL and creatinine of 0.9 mg/dL, and cardiomegaly was no longer noted on chest roentgenogram. The patient was discharged with a prescription of oral and topical fluconazole. During hospitalization, she received a total dose of 1.5 g amphotericin B and 10 g intravenous fluconazole.

Follow-up at 6 months from onset showed no reactivation of infection and attached retina in both eyes. Her best-corrected visual acuity had improved to 6/10 in the right eye with a well-attached retina and some chorioretinal scars (Fig. 3A) but had deteriorated to counting fingers in the left eye because of a chorioretinal scar at the macula (Fig. 3B).
Discussion

*C. albicans* is part of normal flora of the respiratory and gastrointestinal tracts, and can be isolated from the female genital tract in 15 to 21% of non-pregnant women [4, 5]. Because hormonal changes influence colonization by microorganisms, the prevalence of vaginal infections of bacteria and *C. albicans* increase during pregnancy [1–3]. However, bacterial chorioamnionitis develops in less than 2.5% of pregnant women, while the overall incidence of obstetric bacteremia is about 7 per 1000 [10, 11]. On the other hand, *Candida* chorioamnionitis occurs in less than 1% of all pregnant women and mainly contributes to fetal candidiasis [6]. Maternal candidemia associated with pregnancy or in the postpartum period is rarely encountered. Potasman et al reviewed the English literature from 1956 to 1989 via the MEDLINE® database and *Index Medicus*, and found only eight pregnancies complicated with *Candida* sepsis [12]. Seven were considered to have risk factors such as prolonged antibiotic therapy, indwelling catheters, or intrauterine devices.

Ascending vaginal infection by *Candida* through the intact membranes may cause preterm delivery [13–15]. We thus speculated that the organism caused an ascending infection before delivery and resulted in spontaneous rupture of the membrane and preterm labor. The mother’s puerperal fever was due to the sequela of previous *Candida* vaginitis. Trauma of the genital tract during delivery caused direct introduction of fungal organisms into the vascular system and the subsequent development of fungemia. Once the pathogen has been introduced into the circulation, it has the propensity to localize in the organs supplied by end-arterioles, such as the kidney and choroid [16]. In our patient, systemic antibiotics given after delivery exaggerated the dissemination of *C. albicans*.

Our review of the MEDLINE® database back to 1966 found 10 cases of pregnancy-related endogenous *Candida* endophthalmitis (Table) [12, 17–22]. These patients ranged in age from 21 to 37 years. Candidemia developed before the 16th week of gestation in six cases and was a postpartum complication in the others. Five of the women in this series had developed systemic symptoms after surgical abortion, four women became infected via vaginal delivery, and another case was caused by a central venous catheter for hyperalimentation. The most common ocular symptoms were blurred vision, and pain with fever was the usual systemic presentation. All cases had at least one of the following possible risk factors: *Candida* vaginitis, antibiotic therapy, steroid treatment, and the presence of an intrauterine device. In seven cases, a combination of two risk factors probably contributed to the development of candidemia. Only four cases had a positive culture from vitreous specimens. Other positive specimens were obtained from different sources including blood, urine, vagina, and placental and fetal material. Visual prognosis depends on whether lesions involve the macula or not, as well as the early introduction of effective antifungal therapy. In the reported cases identified in our review, no eye with macular involvement had a final visual acuity greater than 20/40. Enucleations were carried out in two patients who did not receive antifungal drugs.

Early focal lesions confined to the retina and choroid may resolve with systemic antifungal agents [19–21]. This treatment is important not only for intraocular infection, but also for microabscesses in other vital organs [19, 20, 21, 23]. Endophthalmitis without evidence of disseminated disease can be treated successfully with vitrectomy and intravitreal injection of
### Table. Case reports of pregnancy-related endogenous *Candida* endophthalmitis

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (yr)</th>
<th>Time of Pariturition status</th>
<th>Ocular symptoms</th>
<th>Initial VA</th>
<th>Sy features</th>
<th>Possible predisposing factors</th>
<th>Positive laboratory findings</th>
<th>Antifungal therapy</th>
<th>Outcome</th>
<th>Final VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>27</td>
<td>Postpartum</td>
<td>Yes</td>
<td>—</td>
<td>—</td>
<td>Sy antibiotics, Sy steroids</td>
<td>None</td>
<td>None</td>
<td>Enucleation</td>
<td>—</td>
</tr>
<tr>
<td>18</td>
<td>22</td>
<td>Postpartum</td>
<td>Normal delivery</td>
<td>OS, blurred vision, floaters</td>
<td>20/25</td>
<td>None</td>
<td>Vaginal culture, urine culture</td>
<td>AmB (iv), fluocytosine (oral)</td>
<td>Dense preretinal scar, 20/200</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>34</td>
<td>Postpartum</td>
<td>Normal delivery</td>
<td>OS, blurred vision, pain, floaters, lid edema</td>
<td>CF/60 cm</td>
<td>Fever</td>
<td>Oral antibiotics, Sy steroid</td>
<td>Vitreous culture</td>
<td>AmB (iv, IVI), fluocytosine (oral)</td>
<td>Extrafoveal chorioretinal scar, preretal fibrosis 20/50</td>
</tr>
<tr>
<td>19</td>
<td>27</td>
<td>16th week of pregnancy</td>
<td>Spontaneous abortion</td>
<td>OD, blurred vision, pain</td>
<td>CF/30 cm</td>
<td>High fever</td>
<td>Retained IUD, Sy antibiotics</td>
<td>Placental and fetal tissue pathology</td>
<td>None</td>
<td>Enucleation</td>
</tr>
<tr>
<td>19</td>
<td>25</td>
<td>16th week of pregnancy</td>
<td>Spontaneous abortion</td>
<td>OD, blurred vision, pain</td>
<td>OD CF/2 m, OS 20/20</td>
<td>High fever, headache</td>
<td>Retained IUD</td>
<td>Blood culture, placental and fetal tissue pathology</td>
<td>AmB (iv), fluocytosine (iv)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>24</td>
<td>15th week of pregnancy</td>
<td>Septic abortion</td>
<td>—</td>
<td>—</td>
<td>Fever, convulsion</td>
<td>Retained IUD, iv antibiotics</td>
<td>Blood culture, material from D&amp;C</td>
<td>AmB (iv), 5-fluorocytosine (oral)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>36</td>
<td>Postpartum</td>
<td>Normal delivery</td>
<td>OD, loss of vision</td>
<td>OD LP, OS 25/20</td>
<td>Fever</td>
<td>None</td>
<td>Vitreous culture</td>
<td>Fluconazole (oral)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>24</td>
<td>16th week of pregnancy</td>
<td>Continuous pregnancy</td>
<td>OS, blurred vision</td>
<td>—</td>
<td>Fever</td>
<td>Candida vaginitis, central venous catheter, Sy antibiotics</td>
<td>Blood culture, serum candida titer, oral &amp; vagina smear</td>
<td>AmB (iv), fluconazole (iv)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>21</td>
<td>6th week of pregnancy</td>
<td>Surgical abortion</td>
<td>OS, blurred vision</td>
<td>20/1200</td>
<td>Fever, abdominal pain</td>
<td>Sy antibiotics</td>
<td>Vaginal culture</td>
<td>AmB (IVI), vitrectomy</td>
<td>Residual macular edema, 20/200</td>
</tr>
<tr>
<td>22</td>
<td>24</td>
<td>4th week of pregnancy</td>
<td>Surgical abortion</td>
<td>OS, blurred vision, red eye</td>
<td>CF</td>
<td>Fever, chills</td>
<td>Oral steroid</td>
<td>Vitreous culture</td>
<td>AmB (IVI), fluconazole (oral), vitrectomy</td>
<td>Recurrent RD with PVR change, CF</td>
</tr>
<tr>
<td>Current report</td>
<td>33</td>
<td>Postpartum</td>
<td>Preterm delivery</td>
<td>OU, blurred vision, pain, red eye</td>
<td>OD 6/20, OS 6/30</td>
<td>Fever, chills, cardiomegaly, impaired renal function</td>
<td>Candida vaginitis, iv antibiotics</td>
<td>Blood culture, vitreous culture</td>
<td>AmB (iv, IVI), fluconazole (iv, oral), vitrectomy</td>
<td>OD, chorioretinal scar, 6/10; OS, chorioretinal scar at fovea, CF</td>
</tr>
</tbody>
</table>

VA = visual acuity; Sy = systemic; LP = light perception; CF = counting fingers; IUD = intrauterine device; D&C = dilatation and curettage; iv = intravenous; IVI = intravitreal injection; AmB = amphotericin B; RD = retinal detachment; PVR = proliferative vitreoretinopathy

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[57x40]J Formos Med Assoc
[133x40]2002 • Vol 101 • No 6
[354x734]Postpartum Endogenous Candida Endophthalmitis

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antimycotics [22, 24, 25]. Systemic antifungal administration combined with vitrectomy and intraocular antimycotics are recommended in severe cases.

_C. albicans_ may cause severe infection during pregnancy or in the postpartum period. Culture of amniotic fluid, especially with abnormal color or smell, is important for the identification of fungal chorioamnionitis. Candidemia should be suspected in pregnant women with antepartum _Candida_ vaginitis, persistent high fever, or poor response to antibiotic therapy. Careful ophthalmologic examinations should be carried out in all symptomatic patients and in those with candidemia or suspected disseminated candidiasis even if there is no ocular complaint. Endogenous _Candida_ endophthalmitis must be included in the differential diagnosis of women with visual disturbance at pregnancy, either postpartum or after invasive procedures for any abortion, especially in those with a history of _Candida_ vaginitis. Only early recognition by gynecologists and ophthalmologists as well as prompt initiation of proper therapy can result in a favorable outcome.

**References**