

Endogenous Endophthalmitis Due to Escherichia Coli and Management

Escherichia Coli'ye Bağlı Gelişen Endojen Endoftalmi ve Yönetimi

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ABSTRACT

Herein two cases with endogenous endophthalmitis and a subretinal abscess due to Escherichia coli (E. Coli) were described. First case was a sixty-eight-year-old male patient with endogenous E. coli endophthalmitis secondary to liver abscess and bronchobiliary fistula. Second case was a thirty-seven-year-old male patient with subretinal abscess caused by renal abscess. Endogenous bacterial endophthalmitis (EBE) and subretinal abscess are unusual, severe and vision threatening conditions that require close, frequent monitoring and should be considered in patients with systemic disorders. Systemic antibiotics, intravitreal antibiotics and vitrectomy have an important role in treatment. Vitrectomy helps to eliminate microorganisms, inflammatory cells, mediators, membranes from the vitreous and helps to get samples for microbiological examination in EBE.

Key Words: Endogenous bacterial endophthalmitis, subretinal abscess, intraabdominal abscess, pars plana vitrectomy, escherichia coli.

ÖZ

Bu makalede E.coli'ye bağlı gelişen endojen endoftalmi ve subretinal abse olgusu sunulmaktadır. İlk olguda karaciğer absesi ve bronkobilyer fistüle bağlı endojen endoftalmi gelişen 68 yaşında erkek hasta sunulmaktadır. İkinci vakada renal abseye bağlı subretinal abse gelişen 37 yaşında erkek hasta sunulmaktadır. Endojen bakteriyel endoftalmi ve subretinal abse yakın ve sıkı takip gerektiren, sistemik bozuklukları olan hastalarda akılda tutulması gereken, olağan dışı, ciddi ve görmeyi tehdit eden durumlardır. Sistemik antibiyotikler, intravitreal antibiyotikler ve vitrektomi tedavide önemli role sahiptir. Vitrektomi endojen bakteriyel endoftalmide mikroorganizmaların, inflammatuar hücrelerin, mediatörlerin, membranların vitreustan elimine edilmesine ve mikrobiyolojik tetkik için örnek almaya yardımcı olur.

Anahtar Kelimeler: Endojen bakteriyel endoftalmi, subretinal abse, intraabdominal abse, pars plana vitrektomi, escherichia coli.

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INTRODUCTION

Endogenous bacterial endophthalmitis (EBE) is a rare condition results with the metastatic seeding of the bacteria to intraocular spaces by bloodstream.¹ Prevalance of EBE is 2-8% and usually related with underlying systemic condition of the patient. Malignancy, diabetes, cardiac diseases, invasive treatment or diagnostic methods, immunosuppression, intravenous drug usage and infections such as urinary tract infections, meningitis, endocarditis and liver abscess are associated situations.¹⁻⁵ Subretinal abscess is an infrequent form of EBE presenting by single, compact, yellow white subretinal lesion with retinal hemorrhages and vitritis.⁶

Herein we report two cases with endogenous endophthalmitis and subretinal abscess due to *E.coli* intraabdominal abscess with different origin. To the best of our knowledge; these are the first cases of *E.coli* endogenous endophthalmitis in a patient with liver abscess and bronchobiliary fistula and a subretinal abscess caused by *E.coli*.

CASE REPORT

Case 1

Sixty-eight-year-old male patient with acute cholangitis was consulted to our clinic with blurred vision in the right eye for 2 days. In his medical history he had gallbladder surgery 30 years ago. He had abdominal pain, nausea, jaundice, darkening of urine color, chills, fever and diagnosed acute cholangitis 7 months ago. A lobectomy operation was performed because of the bronchobiliary fistula. The magnetic resonance imaging of the upper abdomen showed a solitary abscess of the liver. In ophthalmic examination; best corrected visual acuity (BCVA) was hand motion in the right eye and was 20/20 in the left eye. There was 1 mm hypopyon, ++++ tyndall in the anterior chamber in the right eye. Intraocular pressure was 12 mmhg in the right eye and 14 mmhg in the left eye.

Fundus examination revealed severe vitritis in the right eye that; just red reflex of the retina was viewed. Intravenous ampicillin-sulbactam and ornidazole, topical dexamethasone, topical moxifloxacin, systemic dexamethasone, subconjunctival ceftazidime and dexamethasone treatment was started. *Escherichia coli* was detected in blood culture growth. During the first 10 days of treatment; hypopyon was disappeared and BCVA of the right eye increased to counting fingers at 1 meter. Although the treatment was continued for 1 month there was an ongoing severe vitritis in the right eye. 23 G pars plana vitrectomy (PPV) and peroperative intravitreal vancomycin 1mg and ceftazidime 2,25 mg in a volume of 0,1 ml was performed. No organism was detected from vitreous aspirate. Phacoemulsification surgery and foldable posterior chamber intraocular lens (IOL) implantation was performed 1 month after PPV. BCVA in the right eye was 20/32 after 6th month of the cataract operation (Figure 1).

Case 2

Thirty-seven-year-old male patient was referred to our clinic with the complaint of reduced visual acuity in the left eye for 1 week. A history of pyelonephritis and urolithiasis were present for 1 months. BCVA was 20/20 in right eye and 20/50 in the left eye respectively. Anterior segment examination was normal bilaterally. Intraocular pressure was 10 mmhg in the right eye and 9 mmhg in the left eye. In fundus examination moderate vitritis and 1 disc size exudative lesion was present at superior temporal fovea region (Figure 2). Computerized tomography of upper abdomen showed a renal abscess. Topical dexamethasone, topical moxifloxacin and systemic ertapenem therapy was started. In 1 week period BCVA of the patient decreased to counting fingers at 1 meter in the left eye and fundus examination revealed severe vitritis and 2 disc size exudative lesion similar to subretinal abscess. There was leakage from optic disc and parafoveal region in the early phase of fluorescein angiography which increased through the late phase in the left eye and hypofluorescence due to the blockage of subretinal abscess.

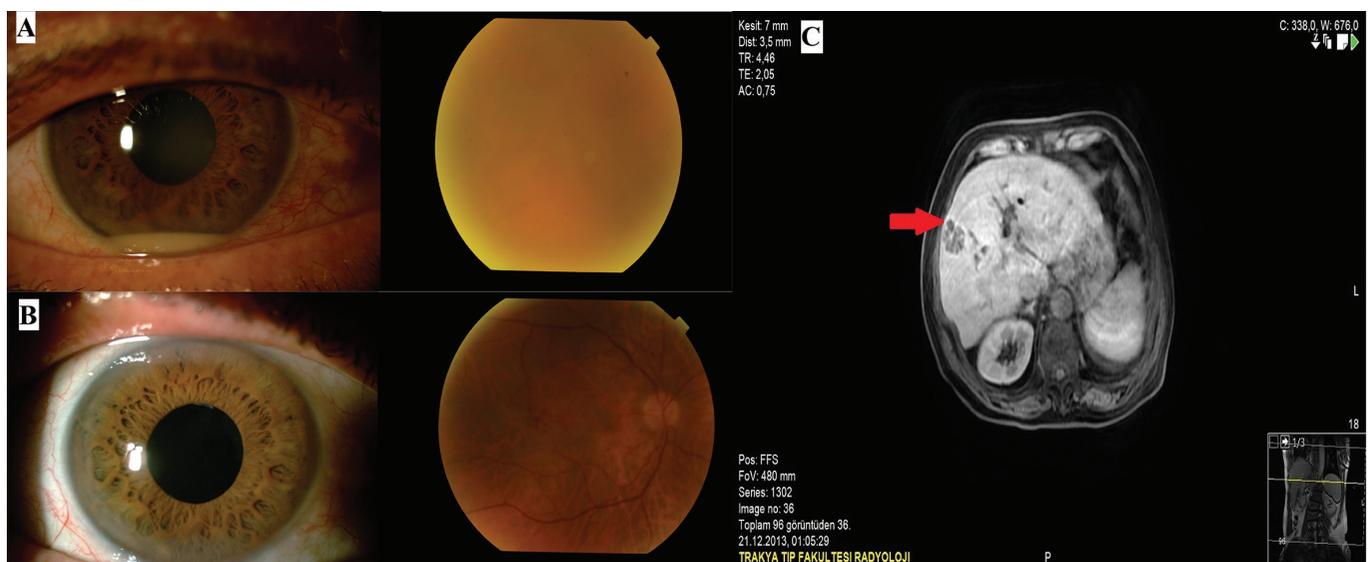


Figure 1a-c: Photograph of hypopyon in anterior chamber and severe vitritis in fundus image (a). Final photograph of anterior segment and fundus (b). A solitary abscess of the liver is seen in the magnetic resonance imaging of the upper abdomen (c).

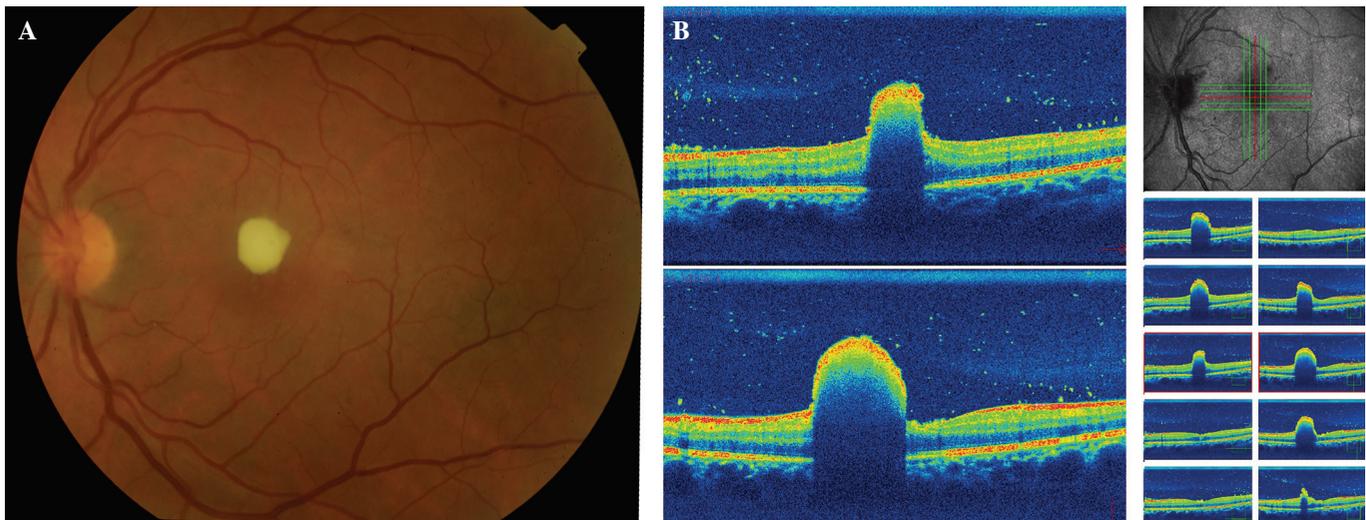


Figure 2a,b: Initial photograph of subretinal abscess (a). Optical coherence tomography image of the subretinal abscess (b).

Vitreous tap and intravitreal amikacin 0.4mg/0.1ml was performed. No organism was detected in vitreous culture but blood culture of the patient showed E coli growth. There was no improvement for the patients symptoms. 23 G PPV and peeling of the exudative lesion was performed. 1 months after vitrectomy vitreus was clear, subretinal fibrosis and epiretinal membrane was observed (Figure 3). BCVA was still counting fingers at 1 meter in the left eye.

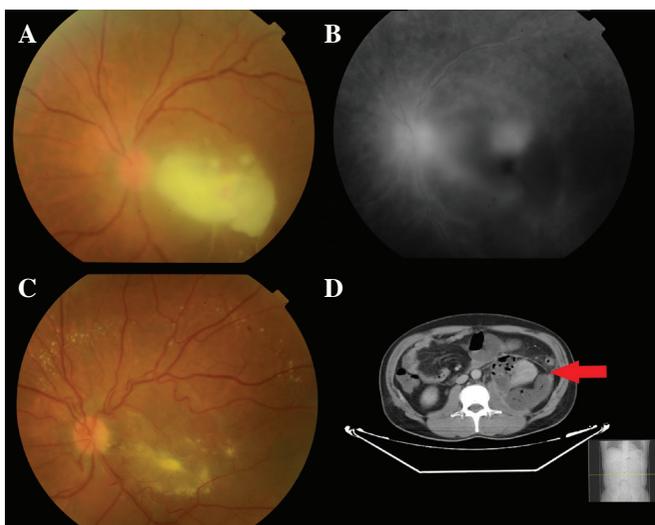


Figure 3a-d: Fundus photograph of the expanded subretinal abscess (a). Fundus fluorescein angiography of the abscess (b). Final photograph of the fundus (c). Renal abscess is seen in the computerized tomography of the abdomen (d).

DISCUSSION

Endogenous bacterial endophthalmitis (EBE) is a rare condition due to E.coli septicemia.³ E. Coli endophthalmitis have poor prognosis and usually observed in patients with diabetes. It is a critical disorder that should be identified in an early period and treated in an aggressive way without delaying.⁷

A large number of the cases were a consequence of urinary tract infections but Wu and Oestreicher demonstrate a case due to E. coli after an ordinary colonoscopy.⁸ Endogenous endophthalmitis related to pyogenic liver abscess are mostly reported with Klebsiella pneumoniae.¹ Subretinal abscess is an unusual presentation of EBE and the majority of the cases are secondary to Nocardia infections. Klebsiella pneumoniae, Streptococcus viridans and Pseudomonas aeruginosa were other reasons for bacterial subretinal abscess.⁶

Systemic antibiotics have higher penetration into the vitreous in intraocular inflammation as a result of increased permeability of the blood-ocular barrier.⁹ Intravitreal administration of antibiotics is the only way to achieve satisfactory drug concentration into the vitreous cavity.¹⁰ Jackson et al. suggested that systemic and intravitreal antibiotics should be the most important part of the treatment.^{11,12} They demonstrated the administration of both systemic and intravitreal antibiotics is related with fewer eviscerations and enucleations, higher preservation of the eye in EBE. They reported the lack of systemic antibiotics is associated with increased mortality rate. Patients receiving intravitreal antibiotics had better visual outcomes compared with patients who had systemic treatment alone.^{11,12} The most common intravitreal antibiotics used for treatment in bacterial endophthalmitis include vancomycin, amikacin and ceftazidime. Sensitivities and spectra of amikacin and ceftazidime are similar.⁹

Vitrectomy helps to eliminate microorganisms, inflammatory cells, mediators, membranes from the vitreous and helps to get samples for microbiological examination in EBE.^{9,11,12} The vitreous samples which were collected during vitrectomy, is known to have higher culture-positive results than a needle biopsy of the vitreous.¹³ Higher diffusion of the antibiotics, early visualization of the retina, and faster recovery of the

visual acuity are the other advantages of the vitrectomy in EBE.^{9,11} Visual acuity worse than hand motion, diffused infiltrations in retina and with a mass of vitreous opacities are the conditions that require vitrectomy.¹³ Ness et al. suggested that vitrectomy makes the visual outcomes better.¹¹ Jackson et al demonstrated vitrectomized eyes had a BCVA 20/200 or better compared with non-vitrectomized eyes.¹¹⁻¹² On the other hand, Lim et al recommended that vitrectomy did not have significant visual benefit but only it prevented evisceration.¹⁴

Here in we report endogenous *E. coli* endophthalmitis in a non-diabetic patient secondary to liver abscess and bronchobiliary fistula. As we see from the case anterior segment findings improved with the systemic, topical and subconjunctival treatment but posterior segment findings persisted and PPV was necessary. Our treatment modality changed according to the condition of the patients. Subconjunctival injections performed for the anterior segment inflammation in the first case. Due to the improvement of the patients symptoms but ongoing vitreous inflammation PPV was performed instead of vitreous tap to eliminate the bacteria, inflammatory cells and toxic debris effectively and to get a sufficient amount of sample for microbiological examination. We report a subretinal abscess in a non-diabetic patient with renal abscess in the second case; it was more aggressive than the first case. It has started with a calm anterior segment, moderate vitritis and a localized abscess formation than turned to severe vitritis, expanding abscess formation and intense retinitis in a week period. Because of the rapid growth of the microorganism vitreous tap and intravitreal amikacin was performed first but there was no improvement for the patients symptoms. Therefore the patient underwent PPV operation.

To the best of our knowledge; These are the first cases of *E. coli* endogenous endophthalmitis in a patient with liver abscess and bronchobiliary fistula and a subretinal abscess caused by *E. coli*.

Although *E. coli* endogenous endophthalmitis is a very progressive disease the treatment procedure still is not clear. Ness et al reported that initial visual acuity and underlying organism is the major risk factors for poor prognosis in EBE.¹¹

However, we see that our patients underwent PPV and the patient with abscess formation had worse prognosis, because of macular localization of the lesion and its tendency to spread rapidly to the retina.

In conclusion; endogenous *E. coli* endophthalmitis is a rare and vision threatening condition that should be considered in patients with systemic disorders. Systemic antibiotics, intra-vitreous antibiotics and vitrectomy have an important role in treatment. The abscess formation and the localization of the lesion are more likely to be important for poor prognosis.

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