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SHORT COMMUNICATION

Endogenous *Pseudomonas* endophthalmitis in an immunocompetent patient

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PURPOSE. *To report an unusual case of community-acquired* Pseudomonas aeruginosa pneumonia *in an immunocompetent host complicated by orbital cellulitis, panophthalmitis, and subcutaneous nodules.*
METHODS. *An otherwise healthy 47-year-old woman presented with a 24-hour history of fever, cutaneous nodules, right sided pleuritic chest pain, and eyelid edema with severe vision loss in her right eye. A chest X-ray demonstrated a homogeneous infiltrate in the right upper lobe. Ophthalmic examination revealed signs of metastatic orbital cellulitis and panophthalmitis. Culture specimens from blood, sputum, skin, and vitreous showed a significant growth of* P. aeruginosa *species.*
RESULTS. *Intravenous antibiotic therapy led to resolution of the pneumonia, cutaneous nodules, and orbital cellulitis. Despite intravitreal and topical antibiotics, the patient finally required enucleation.*
CONCLUSION. *This case represents a rare combination of manifestations in an immunocompetent patient with* P. aeruginosa *infection. It highlights the accelerated course that may result from* P. aeruginosa *infection, the difficulties of treatment, and the poor prognosis in the case of eye involvement. (Eur J Ophthalmol 2007; 17: 461-3)*

KEY WORDS. Pseudomonas aeruginosa, *Metastatic cellulitis, Endogenous panophthalmitis, Community-acquired pneumonia*

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INTRODUCTION

Endogenous endophthalmitis resulting from hematogenous bacterial spread from a primary remote site is a rare entity, especially when associated with concurrent orbital cellulitis (1). *Pseudomonas aeruginosa* is a Gram-negative rod frequently associated with nosocomial infections among critically ill patients, but it rarely causes community-acquired pneumonia or metastatic bacterial endophthalmitis in a normal host (2). We report an unusual case of community-acquired *P. aeruginosa pneumonia* with metastatic orbital cellulitis, panophthalmitis, and subcutaneous nodules in an immunocompetent host.

Case report

A 47-year-old woman presented with a 24-hour history of fever, chest pain, and right periorbital edema with vision loss. The patient did not have any history of ocular or general health problems and she denied any toxic habit. A chest X-ray demonstrated a homogenous infiltrate in the right upper lobe, confirmed by chest computerized tomography (CT). *Pneumonia* was diagnosed, blood cultures and sputum specimens were obtained, and empirical intravenous ceftazidime and gentamicin prescribed. The following day, she developed multiple painful subcutaneous nodules on the trunk, which were biopsied. An

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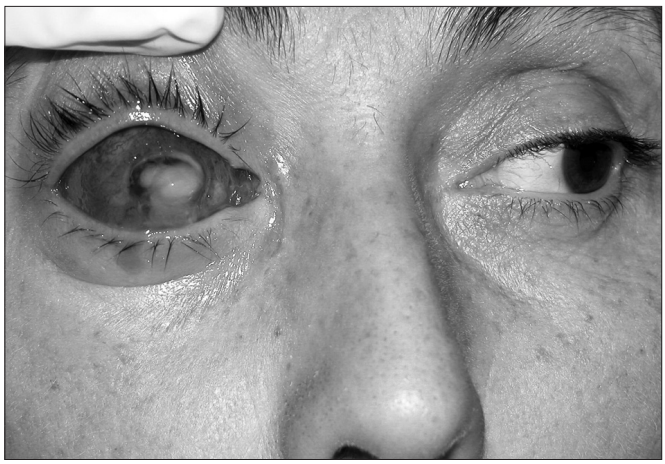

Fig. 1 - *Chemosis, proptosis, ophthalmoplegia, corneal edema, and perforation of the right eye.*

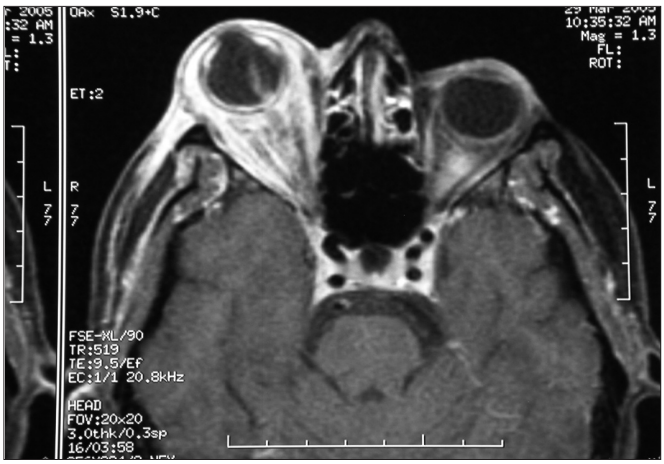

Fig. 2 - *Magnetic resonance scan showing proptosis, extraocular muscle enlargement, retrobulbar fat stranding, choroidal thickening, and vitreous infiltration, compatible with orbital cellulitis and panophthalmitis.*

ophthalmology consultation was also performed. Our examination revealed best-corrected visual acuity to be light perception in the right eye and 20/20 in the left. There was intense chemosis, proptosis, and complete ophthalmoplegia. The cornea was opaque and there was a limbal perforation (Fig. 1). Left eye examination was unremarkable. Magnetic resonance scans showed proptosis of the right globe, extraocular muscle enlargement, and retrobulbar fat stranding consistent with orbital cellulitis. There was also a marked posterior scleral thickening and vitreous infiltration consistent with panophthalmitis (Fig. 2). A corneal scrapping, vitreous tap, and intravitreal injection of vancomycin (1 mg) and ceftazidime (2.25 mg) were performed, and topical fortified ceftazidime and vancomycin was started.

The same specimen of P aeruginosa, sensitive to aminoglycosides, cephalosporins, fluoroquinolones, and especially to imipenem, was isolated from blood, sputum, skin, and vitreous biopsy. Intravenous meropenem was commenced and the other systemic drugs discontinued. On day 7, cutaneous nodules, chest infiltrate, and orbital inflammation commenced to resolve. On day 21, intravenous medication was changed to oral ciprofloxacin, which was maintained for 3 months. On day 40, after a complete resolution of orbital cellulitis, pneumonia, and cutaneous lesions was achieved, the patient underwent enucleation for a painful, hypotonus, blind eye with unacceptable cosmetic appearance. Histopathology showed panophthalmitis with an organized fibrosis in the vitreous cavity. The choroid and sclera were heavily infiltrated by neutrophils and lymphocytes. The culture revealed a significant growth of *P. aeruginosa*. During the hospital stay, a complete evaluation of the immune humoral and cellular status was performed: IgG, IgM, and IgA levels and immunoglobulin subclasses were within normal limits. CD4/8 ratio was 2.1 (reference range 1.0–3.5) and total lymphocyte cell count was 2.8×106/L (1.5–3.5). Human immunodeficiency virus serology performed by enzyme-linked immunosorbent assay technique was negative. Neutrophil function studies were all within normal limits. The patient was also evaluated to rule out undiagnosed heart disease or any neoplastic conditions. Systemic workup, which included echocardiography and abdominal CT, revealed no underlying conditions.

DISCUSSION

P. aeruginosa is a frequent and especially virulent nosocomial pathogen of patients with chronic underlying disease, but it rarely causes community-acquired pneumonia or metastatic bacterial endophthalmitis in a normal host (2). *P. aeruginosa* pneumonia has been associated with some predisposing conditions, such as cystic fibrosis, bronchiectasias, and other pulmonary diseases (3-5). All these factors were absent in our patient.

Endogenous endophthalmitis occurs when organisms reach the internal ocular spaces via the bloodstream by

crossing the blood–ocular barrier, resist host defenses, and multiply within the eye. This clinical entity is associated with underlying medical conditions such as diabetes, cardiac diseases, and malignancy in up to 90% of patients (6). The blood–ocular barrier may prevent many organisms from reaching the internal ocular spaces, as few bacteremic patients develop endogenous endophthalmitis (7). It is not known why some patients develop endogenous endophthalmitis, but in the absence of local or systemic predisposing conditions it may relate to the size of the inoculum or the virulence of the organism. In our case, the accelerated presentation and the extensive growth in the ocular samples of *P. aeruginosa* could indicate a high inoculum of this virulent organism.

This report documents a case of community-acquired *P. aeruginosa pneumonia* complicated by orbital cellulitis, endogenous panophthalmitis, and skin nodules in a patient with no evidence of humoral or cell-mediated immunodeficiency, and no pulmonary predisposing factors for lung infections. Concurrent cellulitis and panophthalmitis is also uncommon, but it has been described in the context of skin burns (8), trauma (9), and the immunocompromised state (1). Outcomes in each of these cases were lack of light perception or enucleation. This case emphasizes that *P. aeruginosa* endogenous endophthalmitis may have an accelerated presentation with a poor prognosis for vision and retention of the eye.

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