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Successful non-operative treatment of a lung abscess caused by Eikenella corrodens

Michel S SLIM, Jay STYLMAN, Karl LI, Louise B GODINE, J Anthony San FILIPPO
From the Departments of Surgery, Pediatrics and Radiology, New York Medical College, Valhalla NY

Summary

A case of a huge lung abscess due to Eikenella corrodens in a severely anemic 3-year old Jehovah's Witness child is presented. Its successful management by repeated thoracenteses, postural drainage and systemic antibiotics is described. The rarity of a lung abscess due to Eikenella corrodens in children is documented on review of the literature. A non-aggressive surgical approach to this infection is recommended in view of the sensitivity of the organism to commonly used antibiotics. The patient was hospitalized for 19 days, received antibiotics for 6 weeks, and has continued to do well on follow-up examination 6 months later.

Key words: Lung abscess, Eikenella corrodens, anaerobic infections

Introduction

Eikenella corrodens, a gram-negative facultative anaerobe of the normal oropharygeal microbial flora, has rarely been reported as a pathogenic organism in childhood. A review of the literature reveals reports of 5 children with serious Eikenella infections involving the pleuro-pulmonary system[1,2,6].

This paper describes a case of a pulmonary abscess due to E. corrodens in a severely anemic child of Jehovahs Witness parents. The beneficial role of percutaneous needle drainage of the pus and systemic antibiotics in the management of this potentially lethal disease is presented.

Case report

T.H., a 3-year old black girl, was transferred to the pediatric surgical service at the WESTCHESTER COUNTY MEDICAL CENTER on 12/31/86 with a one month history of progressively worsening cough, dyspnea, fever, and weakness. She had been taking oral amoxicillin irregularly for two weeks before admission without improvement. She was known to have asymptomatic sickle cell trait. On admission, she weighed 15 Kg, had a temperature of 39.5 degrees C, a pulse rate of 124 per minute, a respiratory rate of 32 per minute and a blood pressure of 98/70 mm Hg . She appeared well-developed and was neurologically normal. She had diminished breath sounds over the right hemithorax. The liver and spleen were not enlarged. The initial CBC showed 5.5 gm/dl hemoglobin, 18% hematocrit, 2.65 x 10^6 erythrocytes and 41700 leucocytes per microliter with 77% neutrophils, 19% lymphocytes and 4% monocytes. The mean corpuscular volume was 68.7 μm^3. Anisocytosis, poikilocytosis, mirocytosis and hypochromia were also noted on the smear. Plain radiographs of the chest showed opacification of the lower two-thirds of the right hemithorax with an air fluid level (Figure 1). The wall of the cavity measured about 1 cm in thickness. As the lateral margin of the right lung formed an acute angle with the right apical pleural liquid, the abscess was considered to be intrapulmonary. This finding was supported by the CT scan of the chest which showed involvement of the right middle lobe by the infectious process (Figure 2).

Address: Michel S SLIM MD, Professor of Pediatric Surgery, New York Medical College Munger Pavilion Pediatric Surgery Division, Valhalla NY, 10595, U.S.A

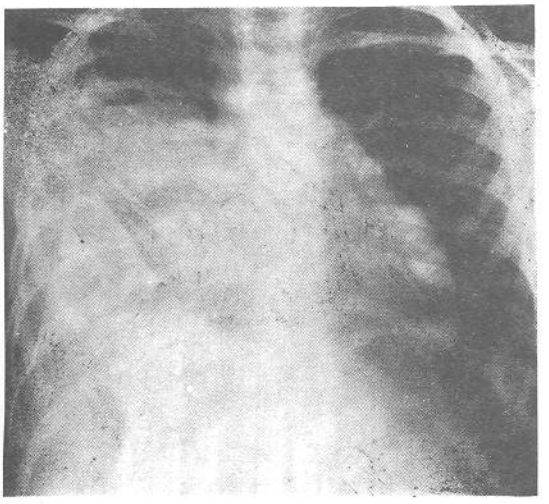

Figure 1: Chest radiograph on admission shows complete opacification of the lower two-thirds of the right hemithorax by a large right middle lobe fluid collection containing an air-fluid level, with a right pleural effusion, and upward bowing of the minor fissure by the mass.

On admission, percutaneous aspiration of the abscess prouced 150 ml of foul-smelling, thick, yellowish pus and 300 ml of air. The fluid contained numerous leucocytes, mainly polymorphonuclear cells, 1 gm/dl protein, 9 mg/dl glucose, 4490 units/liter LDH, and no organisms on gram stain. Blood culture on admission showed no growth, and sputum culture grew alpha-hemolytic streptococci. Empiric antimicrobial treatment was started with methicillin and clindamycin intravenously. Chest radiographs after the thoracentesis indicated persistent fluid within the abscess cavity. A second chest tap performed the following day yielded 80 ml of pus and 300 ml of air and resulted in an improvement in her respiratory difficulty. Culture of the pus grew an isolate identified on the fourth day as E. corrodens, sensitive to ampicillin, penicillin, amikacin, gentamicin, chloramphenicol, trimethoprim/sulfamethoxazole, tetracycline, vancomycim, carbenicillin, cefamandole, cephalothin, piperacillin, and timentin. It was resistant to cefoxitin, cefo-

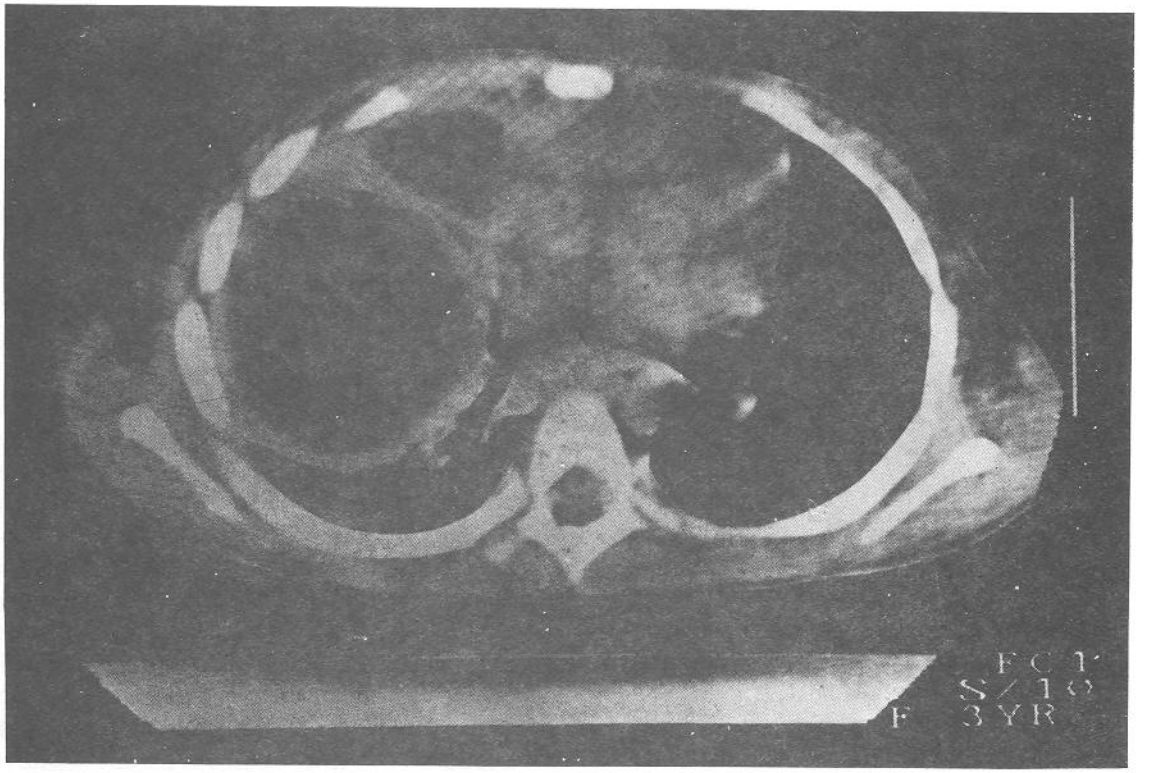

Figure 2: Computed tomography of the chest shows a multiloculated gas-containing abscess occupying the entire right middle lobe.

taxime, clindamycin, erythromycin, nafcillin, moxalactam, tobramycin, nalidixic acid. Antimicrobial therapy was hence changed to parenteral penicillin and gentamicin. The patient defervesced 5 days after admission and 2 days beginning specific antibiotic therapy. Gentamicin was discontinued after one week of therapy and penicillin V was substituted for intravenous penicillin after two weeks. The oral penicillin was continued for a total period of 4 weeks. The anemia was found to be due to a combination of iron deficiency and chronic infection as evidenced by a low serum iron content(17 µg/dl) and a low serum total iron binding capacity(201 ug/dl).
Hemoglobin electrophoresis confirmed the AS pattern of sickle cell trait. Because of her parents belief as Jehovah's Witnesses, the patient was not treated by blood transfusions but was managed effectively with ferrous sulfate orally and her hemoglobin increased to 9.0 gm/dl and hematocrit to 27% on 1/12/87. A chest radiograph two weeks after admission was essentially clear of fluid collections (Figure 3). She was discharged

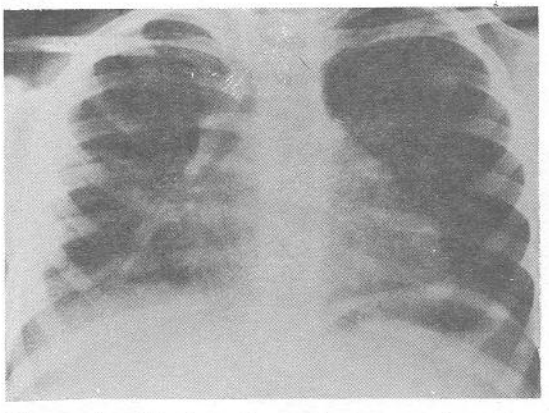

Figure 3: Chest radiograph two weeks after onset of treatment shows marked clearing of the multiloculated right middle lobe abscess, with residual right pleural reaction and areas of atelectasis in the right lower lobe.

on the 19th hospital day in good condition to continue oral penicillin V and supplemental iron. On follow-up six months later, her anemia had resolved and she remained well. Her chest radiograph showed mild right pleural thickening, no residual atelectasis and no pneumatocele in the right middle lobe (Figure 4).

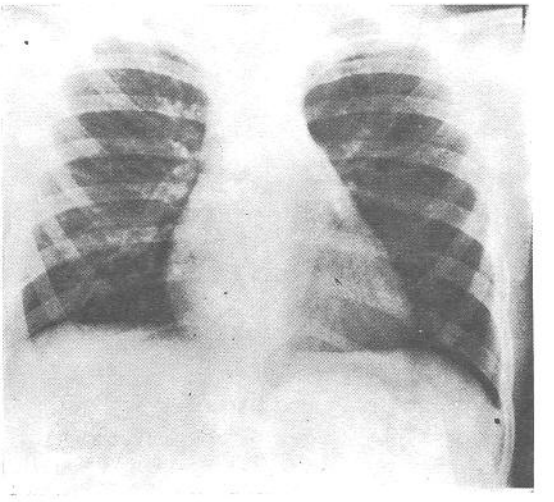

Figure 4: Chest radiograph two months after discharge shows further resolution with minimal residual right basilar streaky densities and right pleural reaction.

Discussion

The organism known as Eikenella corrodens was first described in 1948 by Henriksen who noted three strains of bacteria which grew in a particular concentric pattern[3]. In 1950, Holm called this gram-negative bacterium the "corroding bacillis" due to its ability to pit the surface of blood agar[4]. In 1958, Eiken described the biochemical properties of the organism, naming it Bacteroides corrodens[5]. In 1969, however, Henriksen revealed that the organism was not a strict anaerobe, therefore not a "Bacteroides" [6]. In 1971 Jackson, et al proposed a new genus, Eikenella, for facultative organisms of this class of Bacteroides and grouped them in the Brucellaceae spesies as they shared a similar DNA base. Since then, increasing numbers of cases of infections from Eikenella have been reported. In children, however, it remains a rare pathogen. The organism is often found in the oral cavity as part of the normal bacterial flora and has also been isolated in children from abscesses involving the brain, meninges, mastoid, neck, lungs, pleura, gastro-intestinal tract, ischio-rectal fossa, skeletal system and joints and in orally contaminated wound[1,2,8-16]. E. corrodens is usually sensitive to penicillin as well as ampicillin, tetracycline

and coloramphenicol[2,9], and in contradistinction to Bacteroides corrodens, it is resistant to clindamycin and metronidazole.

The ubiquitous nature of the organism as well as its uncommon presentation as a pathogen have suggested a role for immunologic compromise in the pathogenesis of Eikenella infections in adults, and in some children[9,16]. Underlying conditions in the reported cases have included neoplastic disease, Down's syndrome, chronic aspiration and other chronic illnesses, e.g. anemia[2]. While three of the five previously reported cases of pleural empyema were caused by an isolated E. corrodens infection and treated by surgical drainage and systemic antibiotics[1,2,16], the remaining two children with mixed infections required, in addition, pleural decortication or lobectomy. Our case indicates that infections caused by E. corrodens may in fact be amenable to coservative, non-aggressive surgical measures while the underlying predisposing factor is corrected. The pus was evacuated buy repeated needle aspiration, postural drainage exercises and chest physiotherapy. The organism was treated with specific antibiotics in appropriate doses for a period of six weeks. Bronchoscopic drainage may have offered another therapeutic approach in the management of this patient but was not used, as the initial thoracentesis promptly and successfully drained the abscess which was adherent to the chest wall.

References

1. Kaplan JM, McCracken GH, Nelson JD: Infections in children caused by the HB group of bacteria. J Pediatr 82: 398, 1973.
2. St. John MA, Belda AA, Matlow A, Prober CG: Eikenella corrodens empyema in children. Am J Dis Child 135: 415, 1981.
3. Henriksen SD: Studies in gram-negative anaerobes. Acta Path Microbiol Scand 25: 368, 1948.
4. Hohn, P Studies on the etiology of human actinomycosis. The other microbes of actinomycosis and their importance. Acta Path Microbiol Scand 27: 736, 1950.
5. Eiken M: Studies on anaerobic rod-shaped gram-negative micro-organism: Bacteroides corrodens NSP Acta Path Microbiol Scand 43: 404, 1958.
6. Henriksen SD: Corroding bacteria from the respiratory tract. Acta Path Microbiol Scand 75: 91, 1969.
7. Jackson FL, Goodman YE, Bel FR: Taxonomic status of faculative and strictly anaerobic "corroding bacilli" that have been classified as Bacteroides Corrodens. J Med Microbiol 4: 171, 1971.
8. Barton LL, Anderson LE: Paronychia caused by HB-1 organisms. Pediatrics 54: 372, 1974.
9. Brooks GF, O'Donoghue JM, Rissing JP, et al: Eikenella corrodens, a recently recognized pathogen: Infections in medical-surgical patients and in association with methylphenidate abuse. Medicine 53: 325, 1974.
10. Dorff GJ, Jackson LJ, Rytel MW: Infections with Eikenella corrodens. A newly recognized human pathogen. Ann Int Med 80: 305, 1974.
11. Khairat O: Bacteroides corrodens isolated from bacteriaemias. J Path Bact 95: 29, 1967.
12. Marsden HB, Hyde WA: Isolation of Bacteroides corrodens from infections in children. J Clin Path 24: 117, 1971.
13. Polin K, Shulman ST: Eikenella corrodens osteomyelitis. Pediatrics 70: 462, 1982.
14. Rubenstein JE, Lieberman MD, Gadoth N: Central nervous system infection with Eikenella corrodens: Report of two cases. Pediatrics 57: 264, 1976.
15. Seidel JS, Yamanchi T, Fong C: Arthritis due to Eikenella corrodens. J Pediatr 87: 491, 1987.
16. Raffensperger JG: Eikenella corrodens infections in children. J Ped Surg 21: 644, 1986.