

***Escherichia coli* Brain Abscess in a Very Low Birthweight Premature Infant**

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Brain abscesses are uncommon in neonates and even rarer in very low birthweight infants. Brain abscess could be single [1] or multiple [2,3], and might be associated with various conditions and interventions, such as bacteremia, fungemia [1], scalp vein catheter infection, ventriculoperitoneal shunt ascending infection, or meningitis [3,4].

Diagnosis of a brain abscess in a sick premature infant is now feasible by bedside ultrasound examination. Detection of such an abscess by ultrasound could be incidental or based on suspicious clinical findings. We report here a case of brain abscess in a very low birthweight premature infant and describe relevant microbiologic, imaging and management aspects.

Patient Description

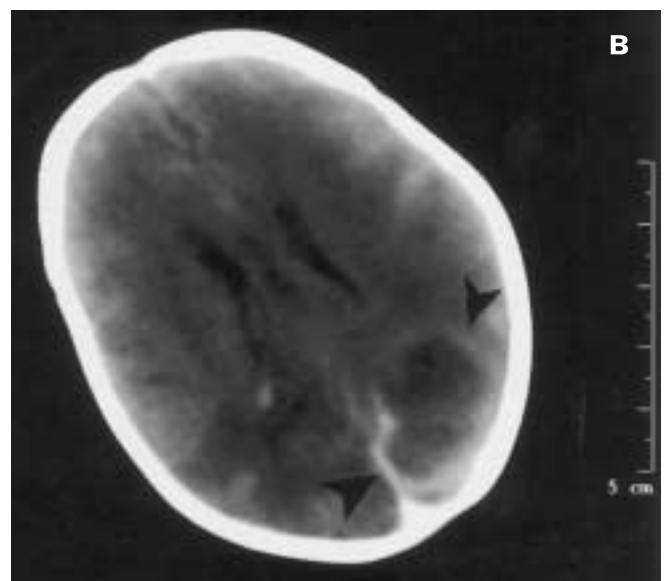
A 28 week female premature infant weighing 1,187 g experienced mild respiratory dis-

stress syndrome after birth. On day 5 of age, ampicillin and gentamicin were initiated due to suspected sepsis. On day 8 her condition deteriorated and antibacterial therapy was switched to vancomycin and imipenem-cilastin, pending results of the sepsis workup. Multiresistant *Klebsiella* grew in the bloodstream but not in the urine or cerebrospinal fluid. Amikacin was added and vancomycin was discontinued. The infant's condition improved and subsequent blood cultures were sterile. Brain ultrasound on day 9 was normal.

On day 22 of age, while on antibacterial therapy, a routine brain ultra-sound revealed a 3 x 2.6 cm hypoechoic and well-defined lesion in the left occipital area [Figure A], which was further delineated by computerized tomography [Figure B]. The lesion was punctured by a neu-

rosurgeon and an exudative hemorrhagic fluid was aspirated in which multiresistant *Escherichia coli* grew with abundance of granulocytes and cell debris. Concurrent CSF examination showed pleocytosis (red blood cells 8,450, neutrophils 975, lymphocytes 57), elevated protein concentration (423 mg/dl) and low glucose concentration (3 mg/dl), without microbial growth. The patient was treated with meropenem for 3 weeks. Brain CT on day 52 revealed a smaller 1.1 x 1.5 cm lesion, and brain ultrasound displayed similar findings. The baby was discharged home on day 73 of age.

CSF = cerebrospinal fluid



[A] Brain ultrasound shows a large, mainly hypoechoic, well-defined parasagittal lesion in the left occipital area (arrows) with mild mass effect on adjacent structures. [B] CT of the brain at the same level showing a low density, well-defined lesion with ring enhancement (arrowheads) after contrast-medium injection.

Comment

The causative pathogens of brain abscess in newborn infants are diverse and include gram-negative bacteria such as *Citrobacter*, *Klebsiella*, *Proteus*, *Serratia*, and enteric species [3,5], coagulase-negative or positive staphylococci [2], anaerobes and *Candida* species [1].

Our tiny premature infant had fulminant gram-negative sepsis and developed partially treated meningitis with brain abscess while on broad-spectrum antibacterial treatment. This case is unique in that the brain abscess was due to multiresistant *E. coli*, a pathogen not previously reported in a very low birthweight premature infant as a cause of brain abscess.

We would like to emphasize the impor-

tance of obtaining material from the brain abscess, whenever possible, for definitive microbial identification and optimization of antimicrobial therapy. In addition, the present case highlights the role of routine bedside ultrasound in neonatal intensive care units for the detection, localization and follow-up of brain abscess in neonates.

References

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