

Two Cases of Diskitis Attributable to Anaerobic Bacteria in Children

Itzhak Brook, MD, MSc

ABSTRACT. Diskitis, an inflammation of the intervertebral disk, is generally attributable to *Staphylococcus aureus* and rarely *Staphylococcus epidermidis*, *Kingella kingae*, *Enterobacteriaceae*, and *Streptococcus pneumoniae*. In many cases, no bacterial growth is obtained from infected intervertebral discs. Although anaerobic bacteria were recovered from adults with spondylodiscitis, these organisms were not reported before from children. The recovery of anaerobic bacteria in 2 children with diskitis is reported.

Patient 1. A 10-year-old male presented with 6 weeks of low back pain and 2 weeks of low-grade fever and abdominal pain. Physical examination was normal except for tenderness to percussion over the spine between thoracic vertebra 11 and lumbar vertebra 2. The patient had a temperature of 104°F. Laboratory tests were within normal limits, except for erythrocyte sedimentation rate (ESR), which was 58 mm/hour. Blood culture showed no growth. Magnetic resonance imaging with gadolinium contrast revealed minimal inflammatory changes in the 12th thoracic vertebra/first lumbar vertebra disk. There was no other abnormality. A computed tomography (CT)-guided aspiration of the disk space yielded bloody material, which was sent for aerobic and anaerobic cultures. Gram stain showed numerous white blood cells and Gram-positive cocci in chains. Cultures for anaerobic bacteria yielded heavy growth of *Peptostreptococcus magnus*, which was susceptible to penicillin, clindamycin, and vancomycin. The patient was treated with intravenous penicillin 600 000 units every 6 hours for 3 weeks, and then oral amoxicillin, 500 mg every 6 hours for 3 weeks. The back pain resolved within 2 weeks, and the ESR returned to normal at the end of therapy. Follow-up for 3 years showed complete resolution of the infection.

Patient 2. An 8-year-old boy presented with low back pain and low-grade fever, irritability, and general malaise for 10 days. He had had an upper respiratory tract infection with sore throat 27 days earlier, for which he received no therapy. The patient had a temperature of 102°F, and physical examination was normal except for tenderness to percussion over the spine between the second and fourth lumbar vertebrae. Laboratory tests were normal, except for the ESR (42 mm/hour). Radiographs of the spine showed narrowing of the third to fourth lumbar vertebra disk space and irregularity of the margins of the vertebral endplates. A CT scan revealed a lytic bone lesion at lumbar vertebra 4, and bone scan showed an increase uptake of ^{99m}technetium at the third to fourth lumbar vertebra disk space. CT-guided aspiration of the disk space yielded cloudy nonfoul-smelling

material, which was sent for aerobic and anaerobic cultures. Gram stain showed numerous white blood cells and fusiform Gram-negative bacilli. Anaerobic culture grew light growth of *Fusobacterium nucleatum*. The organism produced β -lactamase and was susceptible to ticarcillin-clavulanate, clindamycin, metronidazole, and imipenem. Therapy with clindamycin 450 mg every 8 hours was given parenterally for 3 weeks and orally for 3 weeks. Back pain resolved within 2 weeks. A 2-year follow-up showed complete resolution and no recurrence. This report describes, for the first time, the isolation of anaerobic bacteria from children with diskitis. The lack of their recovery in previous reports and the absence of bacterial growth in over two third of these studies may be caused by the use of improper methods for their collection, transportation, and cultivation. Proper choice of antimicrobial therapy for diskitis can be accomplished only by identification of the causative organisms and its antimicrobial susceptibility. This is of particular importance in infections caused by anaerobic bacteria that are often resistant to antimicrobials used to empirically treat diskitis. This was the case in our second patient, who was infected by *F nucleatum*, which was resistant to β -lactam antibiotics. The origin of the anaerobic bacteria causing the infection in our patient is probably of endogenous nature. The presence of abdominal pain in the first child may have been attributable to a subclinical abdominal pathology. The preceding pharyngitis in the second patient may have been associated with a potential hematogenous spread of *F nucleatum*. *P magnus* has been associated with bone and joint infections. This report highlights the importance of obtaining disk space culture for aerobic and anaerobic bacteria from all children with diskitis. Future prospective studies are warranted to elucidate the role of anaerobic bacteria in diskitis in children. *Pediatrics* 2001;107(2). URL: <http://www.pediatrics.org/cgi/content/full/107/2/e26>; *diskitis, anaerobic bacteria, Fusobacterium nucleatum, Peptostreptococcus sp.*

ABBREVIATIONS. ESR, erythrocyte sedimentation rate; CT, computed tomography.

Diskitis, an inflammation of the intervertebral disk, is generally attributable to *Staphylococcus aureus*¹⁻⁵ and rarely *Staphylococcus epidermidis*, *Kingella kingae*,⁷⁻⁹ *Enterobacteriaceae*,^{5,6} and *Streptococcus pneumoniae*.¹⁰ In many cases, no bacterial growth is obtained from infected intervertebral discs.^{1,3-5,11,12} Although anaerobic bacteria were recovered from adults with spondylodiscitis,¹³⁻¹⁶ these organisms were not reported before from children. The recovery of anaerobic bacteria in children with diskitis is reported.

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PATIENTS AND METHODS

Patient 1

A 10-year-old male presented with 6 weeks of low back pain and 2 weeks of low-grade fever and abdominal pain. Physical examination was normal except for tenderness to percussion over the spine between thoracic vertebra 11 and lumbar vertebra 2. The patient had a temperature of 104°F. Laboratory tests were within normal limits, except for erythrocyte sedimentation rate (ESR), which was 58 mm/hour. Blood culture showed no growth. Magnetic resonance imaging with gadolinium contrast revealed minimal inflammatory changes in the 12th thoracic vertebra/first lumbar vertebra disk. There was no other abnormality. A computed tomography (CT)-guided aspiration of the disk space yielded bloody material, which was sent for aerobic and anaerobic cultures. Gram stain showed numerous white blood cells and Gram-positive cocci in chains. Cultures for anaerobic bacteria yielded heavy growth of *Peptostreptococcus magnus*, which was susceptible to penicillin, clindamycin, and vancomycin. The patient was treated with intravenous penicillin, 600 000 units every 6 hours for 3 weeks, and then oral amoxicillin, 500 mg every 6 hours for 3 weeks. The back pain resolved within 2 weeks, and the ESR returned to normal at the end of therapy. Follow-up for 3 years showed complete resolution of the infection.

Patient 2

An 8-year-old boy presented with low back pain and low-grade fever, irritability, and general malaise for 10 days. He had had an upper respiratory tract infection with sore throat 27 days earlier, for which he received no therapy. The patient had a temperature of 102°F, and physical examination was normal except for tenderness to percussion over the spine between the second and fourth lumbar vertebrae. Laboratory tests were normal, except for the ESR (42 mm/hour). Radiographs of the spine showed narrowing of the third to fourth lumbar vertebra disk space and irregularity of the margins of the vertebral endplates. A CT scan revealed a lytic bone lesion at the fourth lumbar vertebra, and bone scan showed an increase uptake of ^{99m}technetium at the third to fourth lumbar vertebra disk space. CT-guided aspiration of the disk space yielded cloudy nonfoul smelling material, which was sent for aerobic and anaerobic cultures. Gram stain showed numerous white blood cells and fusiform Gram-negative bacilli. Anaerobic culture grew light growth of *Fusobacterium nucleatum*. The organism produced β -lactamase and was susceptible to ticarcillin-clavulanate, clindamycin, metronidazole, and imipenem. Therapy with clindamycin 450 mg every 8 hours was given parenterally for 3 weeks and orally for 3 weeks. Back pain resolved within 2 weeks. A 2-year follow-up showed complete resolution and no recurrence.

DISCUSSION

This report describes, for the first time, the isolation of anaerobic bacteria from children with diskitis. The lack of their recovery in previous reports and the absence of bacterial growth in over two thirds of these studies^{2-5,10-12} may be attributable to the use of improper methods for their collection, transportation, and cultivation.

Proper choice of antimicrobial therapy for diskitis can be accomplished only by identification of the causative organisms and of its antimicrobial susceptibility. This is of particular importance in infections caused by anaerobic bacteria that are often resistant to antimicrobials used to empirically treat diskitis.

This was the case in our second patient, who was infected by *F nucleatum*, which was resistant to β -lactam antibiotics.

The origin of the anaerobic bacteria causing the infection in our patient is probably of endogenous nature. The presence of abdominal pain in the first child may have been attributable to a subclinical abdominal pathology. The preceding pharyngitis in the second patient may have been associated with a potential hematogenous spread of *F nucleatum*.¹⁷ *P magnus* has been associated with bone and joint infections.¹⁸

This report highlights the importance of obtaining disk space culture for aerobic and anaerobic bacteria from all children with diskitis. Future prospective studies are warranted to elucidate the role of anaerobic bacteria in diskitis in children.

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