**A 14-year-old Girl Treated for Pyelonephritis**

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An 14-year-old girl was being treated for pyelonephritis and had been on ceftriaxone for 2 days as an inpatient. She presented with mild fever of 99.4°F, dysuria, suprapubic and flank tenderness, and costovertebral angle tenderness, which was consistent with pyelonephritis. Genital exam was normal. She was empirically started on ceftriaxone, and subsequently, the urine culture grew *Escherichia coli*, which was susceptible to ceftriaxone.

Her dysuria resolved, and she had been afebrile for 24 hours before having lower back pain. The pain was excruciating, 10/10 in severity, non-radiating, aggravated by movement, and relieved somewhat by rest and analgesics. She denied having any tingling, numbness, or weakness in the lower extremities. She denied any trauma to the back before being admitted.

Because the patient experienced pain, her suprapubic and costovertebral angle tenderness resolved. However, there was severe tenderness noted on the

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**Editor’s note:** Each month, this department features a discussion of an unusual diagnosis in genetics, radiology, or dermatology. A description and images are presented, followed by the diagnosis and an explanation of how the diagnosis was determined. As always, your comments are welcome via e-mail at pedann@slackinc.com.

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**Figure 1.** CT scan of the lumbosacral spine showing the sclerotic and lytic changes in the body of the S1 vertebra.

For diagnosis, see page 751.
spinous processes of the L5-S2 vertebrae. In addition, there was paraspinal muscle tenderness and sacroiliac joint tenderness on the right side. Straight leg raising test was possible only up to 20 degrees. Her neurological exam was completely normal, although gait was not assessed because she was unable to walk because of the pain.

Lab studies were CBC: 22.9 > 12.3 < 170, N = 90.2, L = 3.0, M = 6.7; UA: cloudy, 1.019, moderate blood, 200 protein, leucocyte esterase-large, nitrite-negative, WBCs = 700/HPF, RBCs = 8/HPF; pregnancy test negative; urine culture: grew > 100,000 CFU/mL of *E. coli*, which was susceptible to ceftriaxone.

She was treated with morphine via PCA pump for the pain. Additional imaging studies were done, which led to the diagnosis (see Figure 1, page 749, and Figure 2 and Figure 3, page 750).

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Figure 2. CT scan showing the bilateral multifocal pyelonephritis.

Figure 3. MRI of the lumbosacral spine showing the sclerosis and lytic changes in the body of S1 vertebra.
Vertebral Osteomyelitis

A CT scan of the lumbosacral spine with and without contrast revealed bilateral multifocal pyelonephritis and sclerosis of the S1 vertebra consistent with a degenerative lesion of the upper end of the vertebra. There was also minimal degenerative change at the L4-L5 vertebra. The MRI confirmed these findings. These degenerative lesions were consistent with vertebral osteomyelitis, which was presumed to be secondary to the acute pyelonephritis.

The patient was treated with intravenous antibiotics for 3 weeks, followed by 3 weeks of oral antibiotics. She was re-evaluated in the outpatient clinic and was doing very well without any pain or other complaints 1 week after discharge. We had decided to do follow-up imaging studies, but she was lost to follow-up.

Vertebral osteomyelitis after a urinary tract infection has been recognized in adults with comorbid conditions, such as diabetes mellitus.1 To our knowledge, it has been rarely reported in the pediatric population. The organisms reach the vertebra from the urinary tract via a network of veins called Batson’s plexus of veins.1 In 1940, Batson demonstrated that the prostatic plexus and a multitude of venules ramify throughout the pelvis.

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These veins then go around the hip joints. Batson postulated that this plexus of veins usually has very sluggish flow when the pressure in the abdominal cavity is normal. When the pressure in the abdominal or thoracic cavities increases during coughing or straining, the flow in the Batson’s plexus rises.

This plexus of veins is more extensive in the thoracic and lumbar region, which explains why epidural abscesses are more common in these regions in the elderly population.2 The paravertebral plexus can also lead to vertebral osteomyelitis.

Definitive diagnosis of vertebral osteomyelitis is done by biopsy and culture of the biopsied sample but was not performed in our patient. We presumptively treated her with ceftriaxone for 3 weeks and then an oral, third-generation cephalosporin for 3 weeks. According to Sapico and Montgomerie, the condition has to be treated for at least 6 weeks or more with antibiotics.3

REFERENCES