
Communications

Meatal Stenosis and Spinal Osteomyelitis: A Case Report

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The association of urinary tract pathology and vertebral osteomyelitis is not a new one. Anatomic bases for this association were laid by Chaussier (1746-1828), who demonstrated the numerous venous communications between the pelvic and paravertebral plexuses. Batson,¹ in 1940, showed the physiologic process by which such communications become operative. He injected a mixture of thorium dioxide and radiopaque material into the deep dorsal vein of the penis and found that when intrabdominal pressure is increased (eg, straining or coughing), the agents first filled the vessels of the pelvic basin and then entered the paravertebral plexus to eventually reach the intracranial venous sinuses. While other theories of metastatic spread of malignant and septic foci remain extant, Batson's explanation is the one most commonly accepted.

Numerous reports of vertebral osteomyelitis and urinary tract pathology exist in the literature.²⁻⁴ This association is seen less frequently since the advent of the broad spectrum antibiotics. Yet the relationship must be borne in mind by the physician evaluating urinary tract dis-

ease and back pain. Most commonly the history is one of instrumentation of the urinary tract⁵⁻⁷ (often, but not necessarily, in the face of infection) with the subsequent onset of back pain and eventual diagnosis of osteomyelitis. Herein is a report of a case of spinal osteomyelitis apparently secondary to urethral meatal stenosis.

Case Report

A 39-year-old patient with adult onset diabetes had a two-year history of intermittent urinary tract infection and low back pain secondary to trauma. Six weeks before admission he was seen with an *Escherichia coli* urinary tract infection but failed to take the prescribed medication. Lumbosacral spine films were taken for increased back pain and were reported as negative. At the time of hospital admission he complained of severe back pain, definite weight loss, and generalized malaise. Physical examination revealed marked tenderness at L1-L2, positive straight leg raising sign on the left without lower extremity reflex changes. There was also marked phimosis, balanitis, and severe meatal stenosis. A subsequent cystoscopy revealed heavy bladder trabeculation. White blood cell count was normal but acid phosphatase and erythrocyte sedimentation rate (ESR) were elevated. A PPD was positive. Urinalysis showed

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many white blood cells and culture revealed significant *E coli* infection.

Because of vertebral column findings repeat lumbosacral films were done. These now showed narrowing of the L1-L2 disc space with osteolysis. Bone scan revealed increased uptake in this area. Bone biopsy with cultures showed chronic active osteomyelitis and infection with *E coli* with antibiotic sensitivities identical to the organism isolated from the urine. Acid fast and fungal cultures were negative. Serial antibody titres against typhoid O and H, paratyphoid A, B, and C, proteus OX19, 2 and K and *Brucella abortus* did not implicate these organisms.

The patient was treated by dorsal slit, meatotomy, application of a body cast, bedrest, and intravenous cefazolin. Following six weeks of therapy, the body cast was removed and repeat x-rays revealed partial healing. Back pain was minimal. The urine was sterile and the ESR and acid phosphatase had returned to normal. Currently, 18 months later, he has resumed work as a laborer and his urine remains sterile.

Discussion

A brief consideration of certain aspects of this case should help to point out the clues in establishing a link between these seldom associated entities. The urinary tract is the most common internal source for vertebral column infection,⁸ though its "spontaneous" development without antecedent manipulation is unusual.² A history of clinical bacteremia often follows hard upon such instrumentation.

Typically, spinal osteomyelitis begins as vague back pain several days to a few weeks after the above events. This usually progresses to severe pain, local tenderness, and rigidity of the spine. Movement is excruciating. X-ray findings, however, may not develop until later. Serial studies are therefore indicated. X-ray findings, in order of their usual appearance are (1) disc space narrowing, (2) loss of trabeculation and rarefaction of bone of adjacent vertebrae, (3) cavity formation, (4) vertebral body collapse, and (5) bony sclerosis upon healing. Erythrocyte sedimentation rate should be consistently and definitely elevated prior to therapy.

Urine may or may not be infected at this time, but review of records will usually show infection at the time of, or shortly after, manipulation. At times only a clinical history of bacteremia will be obtained. Needle biopsy and culture of the spinal lesion should confirm the association. Gram negative enteric organisms have predominated, but staphylococci and streptococci are also reported.^{5,6} Positive bone culture for these commonly offending organisms will rule out other disorders which must be mentioned in the differential diagnosis. These include Pott disease, brucellosis, typhoid and paratyphoid infection, multiple myeloma, and metastatic carcinoma.

In those cases uncomplicated by vertebral body collapse, extensive abscess formation, sepsis, or paralysis, the usual regimen of long-term strict immobilization and antibiotics affords a good prognosis. Paramount in avoiding these grave sequelae is the knowledge of the association between urinary tract infection and spinal osteomyelitis. A high index of suspicion in cases of newly acquired back pain in the face of recent urinary tract infection with or without instrumentation is warranted. Serial radiographs of the spine are the most important means of establishing the diagnosis, though Tc99m bone scanning can give important information somewhat earlier than diagnostic radiographic changes.⁹

References

1. Batson OV: The function of the vertebral veins and their role in the spread of metastases. *Ann Surg* 112:139, 1940
2. Henriques CQ: Osteomyelitis as a complication in urology. *Br J Surg* 46:19, 1958
3. Leigh T, Kelly R, Weens H: Spinal osteomyelitis associated with urinary tract infections. *Radiology* 65:334, 1955
4. Henson SW Jr, Coventry MB: Osteomyelitis of the vertebrae as the result of infections of the urinary tract. *Surg Gynecol Obstet* 102:207, 1956
5. Hale JE, Aichroth P: Vertebral osteomyelitis: A complication of urological surgery. *Br J Surg* 61:867, 1974
6. Moffat N: Spondylitis following urinary tract instrumentation. *J Urol* 110:339, 1973
7. Defeo E: Osteomyelitis at the spine following prostatic surgery. *Radiology* 62:396, 1954
8. Griffiths HED, Jones DM: Pyogenic infection of the spine. *J Bone Joint Surg* 53B:383, 1971
9. Handmaker H, Leonard R: The bone scan in inflammatory osseous disease. *Semin Nuc Med* 6:95, 1976