Lumbar artery pseudoaneurysm as a late complication of osteomyelitis with vertebral body destruction

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We report the case of a 79-year-old patient whose acute back pain revealed a 9-cm nonruptured lumbar artery pseudoaneurysm occurring 5 years after a vertebral body osteomyelitis that induced a significant vertebral destruction. She underwent an urgent percutaneous selective arterial embolization. Lumbar artery false aneurysm should, thus, be suspected as a possible etiology of any new painful symptoms in patients suffering from a chronic vertebral destructive disease. (J Vasc Surg 2013;58:1084-7.)

CASE REPORT

A 79-year-old female patient came to the emergency department because of acute back pain. Acetaminophen and codeine could not relieve the pain. Her body temperature was 99°F and blood pressure was 160/90 mm Hg. She did not report any recent episodes of fever. Upon physical examination, she had kyphoscoliosis with lumbar spine stiffness without any lower limb sensory or motor deficit. No lower back tenderness was elicited on palpation. There were no local inflammatory signs, and abdominal palpation was unremarkable. She had neither spine nor abdominal trauma in the past. Her blood test showed no signs of infection with a C-reactive protein blood concentration of 13 mg/dL and a white blood cell count of 9500 cells/mm^3. Her serum creatinine was 2 mg/dL. Her medical history was significant for a 5-year-old bifocal vertebral osteomyelitis, L2-L3, and L3-L4 because of a B-streptococcus that was considered cured after 8 weeks of antibiotic therapy. She did not undergo a vertebral biopsy at that time, and computed tomography (CT) scan had already shown evidence of vertebral body destruction (Fig 1, *A*).

She first had a noncontrast CT scan showing a hypodense mass located adjacent to L3 and L4 vertebral bodies that were noted to have substantial lytic destruction (Fig 1, *B*). This was initially thought to be a possible abscess or tumor. Fortunately, despite her moderate renal dysfunction, she had an enhanced CT scan to evaluate the risk of postbiopsy bleeding. It revealed a 9-cm left lumbar artery pseudoaneurysm (LAPA) and no infiltration of surrounding soft tissues, suggesting the lack of an ongoing septic process (Figs 1, *C* and *D*, and 2). Biopsy was then judged unnecessary and hazardous. Considering potential complications of an open abdominal vascular surgery in a 79-year-old patient, we opted for a percutaneous endovascular therapy. Under local anesthesia and through right femoral access, the involved lumbar artery was catheterized; no tributary supplying the spinal cord was seen during opacification. We embolized the inflow, the sack, as well as the outflow of the pseudoaneurysm (Fig 3, *A* and *B*) with six coils and one gelatin sponge. The asymptomatic patient was discharged from the hospital at day 3. Orthopedic consultation stated her spine was not to be operated on because there was no instability. One-month enhanced CT scan showed a thrombosed pseudoaneurysm (Fig 3, *C* and *D*). At the 3-month follow-up visit, the patient remained asymptomatic. No lumbar instability (catch sign, apprehension sign) was found on examination. Control duplex ultrasound showed no residual aneurysmal perfusion.

DISCUSSION

LAPA is a rare entity arising from observable injuries to lumbar arteries because of various reported predisposing factors. Lumbar arteries appear as such to be vulnerable to trauma (gunshots, spine fracture, stab wounds, or blunt trauma),[1,2] iatrogenic lesions (laparoscopy, spinal anesthesia, vertebral biopsy or surgery, chiropractic manipulations, nephrolithotripsy, or vena cava filters),[3-9] Ehlers-Danlos syndrome,[10] or local acute infections.[11] Lumbar artery lesions, given their propensity to rupture, appear to be a potentially serious collateral damage of which clinicians should be aware.[12,13] To the best of our knowledge, two cases have been previously published with no such offending factors,[12,14] of which one of them suggested vertebral bodies fishbone-like deformity related to osteoporosis.[14] In our case, there were very advanced destructions of L3 and L4 vertebral bodies (Figs 1, *B* and *C*, and 3, *D*). Indeed, vertebral osteomyelitis is known for causing serious vertebral alteration.[15]

Our observation underlines the wide range of time possibly needed by the LAPA to become symptomatic. Indeed, our patient's acute back pain, which is a telltale sign of pseudoaneurysm, occurred 5 years after the

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Fig 1. A, Nonenhanced computed tomography (CT) scan, coronal view: bifocal spondylodiscitis L2-L3 and L3-L4 showing loss of disc height and vertebral endplates erosion. **B,** Nonenhanced CT scan, coronal view: hypodense mass lesion located inside the destructed L3 and L4 bodies. **C** and **D,** Enhanced CT scan coronal and plain views revealing a voluminous pseudoaneurysm with thrombus inside. *Circle* = L3; *triangle* = L4.

vertebral osteomyelitis. Pathogenesis of the LAPA probably may have combined an initial lesion resulting from the contiguous vertebral infection extension to the lumbar artery and a more progressive phenomenon involving the massive destruction of L3 and L4 that may have ultimately eroded and distorted the artery.

LAPA ruptures are life-threatening[12,13]; therefore, once a diagnosis is made, prompt treatment is mandatory. We chose percutaneous selective arterial embolization, as it has emerged as the gold standard treatment owing to its minimally invasive nature and its efficacy.[5,8,9,11,14,16] Small particle use, potentially migrating very distally into artery outflow, has been incriminated in the excessively rare neurologic complications. One single case, to our knowledge, of spinal ischemia after lumbar artery embolization was reported.[17] Percutaneous thrombin injection is an alternative technique,[10,18] but in our case, the profound location of the LAPA, in lieu of former vertebral bodies, appeared to us as an anatomic difficulty. LAPA surgical resection carries a high morbidity. Therefore, we would have only performed open surgery subsequent to embolization and intensive antibiotic therapy, in cases of proven residual infection needing open debridement. This endovascular-first strategy was

Fig 2. Aortic abdominal three-dimensional reconstruction left three-fourths view showing the lumbar artery from which the pseudoaneurysm is originating.

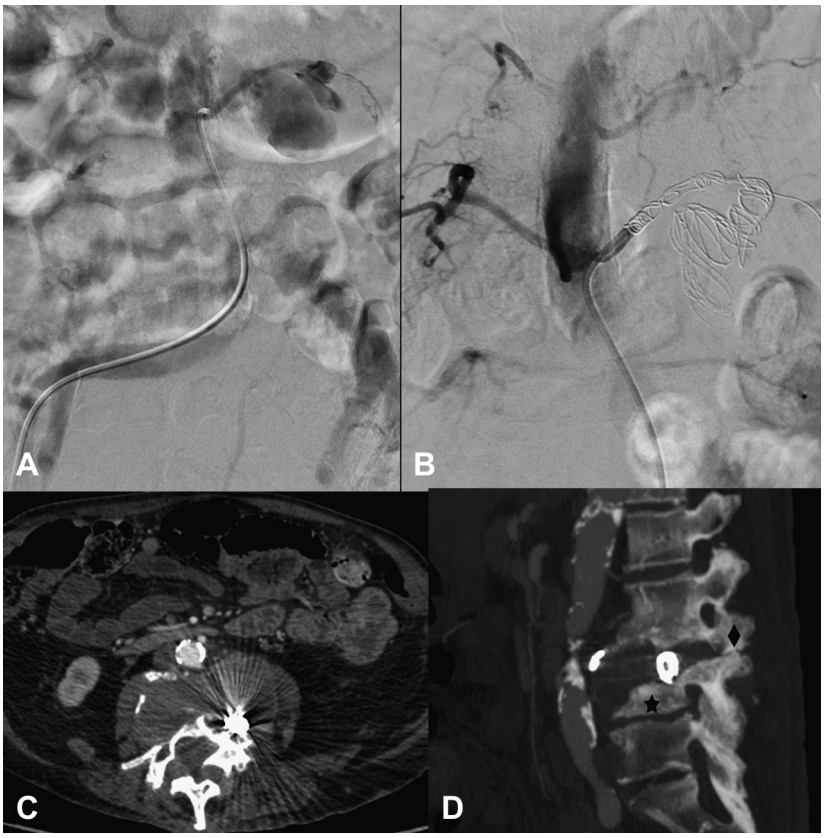

Fig 3. A, Selective left lumbar artery catheterization locating the pseudoaneurysm. **B,** Left lumbar arteriogram showing no more filling of the pseudoaneurysm after its coil embolization in addition to embolization of proximal and distal parts of the lumbar artery. **C** and **D,** Enhanced computed tomography (CT) scan plain and sagittal views displaying coils in lieu of the destructed upper part of L4 and lower part of L3. *Diamond* = posterior articular process of L3; *star* = residual body of L4.

successful in treating infected aortic aneurysms.[19] Duplex ultrasound, avoiding iodinated contrast agents, allows efficient vascular surveillance. Pseudoaneurysm recurrence, lumbar spine instability, or worsening of vertebral bone lytic destruction would prompt spine stabilization, which has not preventively been done because of its morbidity in the setting of osteomyelitis.[20]

In conclusion, progressive degradation of the lumbar spine can induce over time a LAPA formation due to their close anatomic proximity. To our knowledge, this is the first time that vertebral osteomyelitis is reported as the cause of such a phenomenon. In these conditions, diagnosis can be tricky when evaluating clinical findings and nonangiographic medical imaging of these spine-ill patients complaining of new acute back pain. A vascular etiology should be suspected because LAPAs are a potential source of massive hemorrhage.

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