Paravertebral abscess by *Escherichia coli* and melanoma metastasis in an older woman

Ascesso paravertebrale da Escherichia coli e melanoma metastatico in una donna anziana

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**INTRODUCTION**

Lumbar paravertebral abscesses are considered uncommon, and *Staphylococcus aureus* is a main aetiologic agent [1, 2]. This condition can pose diagnostic challenges, and it is increasing in number among older people [1-8]. Acute appendicitis, diverticulitis, retroperitoneal infections, fractures, synovitis, rheumatoid arthritis, septic arthritis and sacro-ileitis are the usual differential diagnosis [2]. Major predisposing factors include diabetes mellitus, chronic renal failure, immunosuppression, intravenous drug use, HIV infection, corticosteroid therapy, indwelling devices, orthopedic prosthesis, ageing, and malignancy [1, 2, 4, 9-11]. Clinical manifestations are non specific, but some symptoms may be indicative of this condition, as localized back pain (90%), fever (52-80%), lower limb weakness (50%), and weight loss (20%) [1-4]. Computed tomography (CT) and magnetic resonance imaging (MRI) are the best diagnostic tools, but microbiological cultures are required to establish the aetiology of the inflammatory necrotic process [1-8]. Early diagnosis and prompt antibiotic therapy reduce the mortality rate, which can be up to 32% [1-3]. Single case studies should be reported in order to enhance the awareness about this curable entity.

**CASE REPORT**

An 81 year old hypertensive and diabetic woman, three months ago had left lumbar pain with progressive increase in intensity and irradiation to the ipsilateral lower limb. She claimed of decrease in strength, hypoesthesia and difficulty in walking due to pain. There was no fever, weight loss, urinary incontinence and other disorders. She denied tobacco smoking and alcohol abuse and, before the admission at our service she utilized analgesics and physiotherapy without significant improvement. Evaluation of lumbar spine was then performed by MRI, which revealed a great heterogeneous mass involving L5 vertebral body with pathological fracture, pedicles and left transverse processes of L4 and L5, left sacral wing and left iliac bone, in addition to extension to adjacent soft tissues (Fig. 1). The changes also affected the spinal canal at L5 level, with compression of dural sac and nerve roots. Other findings included bone spurs in the vertebrae, arthrosis of interapophyseal joints, anterolisthesis of L4 over L5 (grade I), moderate lumbar degenerative disc disease with diffuse bulging of intervertebral discs, and foci of
radial fissures in the fibrous annulus of the discs. The mass measured 9.0x8.2x8.1 cm and caused stenosis of spinal canal at L5 and left neural foramina L4/L5 and L5/S1. Laboratory determinations and control data are showed in Table 1. Remarkable findings were anemia, neutrophilic leukocytosis, high erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP). The PPD test was negative. Surgical procedure provided tissue samples and drained a whitish matter. The search for mycobacteria was negative, and the cultures from abscess fluid revealed *Escherichia coli*, susceptible to ciprofloxacin (MIC ≤1 µg/mL), as well as to 15 other tested antibiotics, and resistant to ampicillin and sulbactam (>16 µg/mL). After the abscess drainage, and the administration of a complete schedule of ciprofloxacin 400 mg day i.v. in two doses for one week, and converted to the oral route 1,000 mg daily during two additional weeks of treatment, a significant clinical improvement was observed. However, the histopathology study revealed characteristics of a fusocellular malignancy with high nuclear grade, strongly consistent with the diagnosis of metastatic melanoma. Imaging studies of total body did not disclose other sites of metastases, and the patient was referred to Oncology management.

**DISCUSSION**

We herein report an 81-year-old hypertensive and diabetic woman with lumbar pathologic fracture and a voluminous paravertebral abscess by *E. coli*. As her non specific manifestations included neurological changes, our initial concern was about the possibility of malignancy. Routine tests showed anemia, neutrophilic leukocytosis, and high ESR and CRP levels that are useful diagnostic clues [1-4]. Furthermore, the histopathology findings revealed features of melanoma from unknown primary site.

Low back pain is a very common complaint, and not all cases are due to a benign origin [9]. Spine is a frequent site of bone implants, and cancers associated with paravertebral abscesses can have poor prognosis [11]. Psoas abscess may be the ini-
tial presentation of these challenging conditions [10]. Iliopsoas and paravertebral muscles are the most common sites of muscle metastases (52.5%), followed by gluteal (16.3%), lower limb (12.5%), abdominal (10%), thoracic (5%), and upper limb (3.8%) [12]. The most common involved cancers are genital (24.6%), gastrointestinal (21.3%), urological (16.4%), melanoma (13.1%), bronchial (8.2%), thyroid (4.9%), breast (3.3%), and unknown site (8.2%) [9-12].

Psoas abscess has been considered an uncommon entity with late diagnosis due to non-specific manifestations, and often associated with long-standing admissions and poor outcomes [1, 2, 5]. Secondary involvement of spine structures may occur and predominantly affects lumbosacral areas [9]. Italian studies have focused diagnostic challenges and management appropriateness in osteomyelitis, spondylodiscitis, and prosthetic joint infections among adult patients [13, 14]. Worthy of mention is the role played by utilization of respective guidelines, which can lower morbidity and mortality rates [13]. Moreover, recent national survey found positive impact of recommendations of infectologists about dosage and duration of antimicrobial administration, and cost versus effectiveness of therapy [14]. Carrèga et al. reviewed 45 cases of non-tuberculous vertebral osteomyelitis in Italy and found 71% of spontaneous origin; 68% in the lumbosacral region, and beta-lactam-sensitive staphylococci were the main causal agents of spondylodiskitis [15]. The majority of patients (65.6%) were male, with mean age of 62 years, and their comorbidities included alcoholism, diabetes, HIV infection, vasculopathy, and malignancy [15]. All them claimed of localized pain, but fever (59.3%) and inflammatory markers (31.2%) were not uniformly present [15]. Salmonella spp (2/5), Enterobacter spp, Proteus spp, and E. coli were the Gram-negative aetiological agents isolated in five patients [15]. Worthy of note, 29% of total cases had iatrogenic origin, and the lesions also developed in the lumbosacral spine; the predominant etiologic agents were staphylococci, while E. coli was detected in one patient [15]. The authors emphasized the good response to antibiotic therapy alone in spontaneous episodes, while surgery was more often required in the dorsal localization or in the presence of foreign bodies [15]. Fernández et al. presented the case study of a 78-year-old diabetic woman with lumbar osteomyelitis, spondilitis, spondilodiskitis, and paravertebral and psoas abscesses caused by E. coli [3]. Before admission, she underwent a treatment with dexamethasone and lidocaine because of lumbar pain irradiating to the knee joint and occurred a diabetic decompensation, which led to the hospitalization. The diagnosis was established by images of CT and MRI, and urinary tract was the focus of infection. Despite of use of ciprofloxacin the patient did not improve and she died on D12 after admission [3]. Graham et al. reviewed microbiological findings from 79 patients with diagnosis of haematogenous vertebral osteomyelitis and reported 12.6% of cases caused by Gram-negative agents [4]. The relative frequency of positive bacterial cultures showed E. coli (4/10), Pseudomonas aeruginosa (3/10), and Klebsiella pneumoniae, Haemophilus influenzae, and Enterobacter cloacae (1/10) each [4]. Antbiotic therapy alone (6/8) or associated with surgery (2/8) controlled eight infections, and ciprofloxacin was employed in five of them; in two of the cases (2/10), the antibiotic therapy failed [4]. The authors concluded that treatment of Gram-negative haematogenous osteomyelitis is challenging, the mean time of antibiotic use is approximately 20 days, and ciprofloxacin is an effective option [4]. Hsiao and Liang reported a 41-year-old paraplegic man with chronic urinary infection, who developed unsuspected lumbosacral osteomyelitis by E. coli. Late diagnosis was due to the lack of back pain and local tenderness; in addition to active urinary focus as the most probable origin of the fever [5]. Initial spine X-ray and abdominal ultrasonography images did not detect the site of infectious process. Further evaluation by CT and MRI images disclosed consistent changes of vertebral osteomyelitis and paravertebral abscess, successfully controlled with antibiotics plus paravertebral debridement [5]. Marroni et al. reported a 64 year old woman who underwent laminectomy of L2-S2 and developed an early postoperative infection by S. aureus not controlled by antibiotic therapy alone. She evolved to chronic infection in spite of extraction of the instrument that was acting as foreign body. Antibiotic-resistant Candida albicans, coagulase-negative staphylococci, Enterococcus faecium, Proteus mirabilis, Enterobacter cloacae, and E. coli were the microbial agents detected in the liquor samples [16]. The authors highlighted the role of long-term antibiotic specific therapy in
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nosocomial osteomyelitis complicated with paravertebral abscess and liquoral fistula, caused by multidrug-resistant agents [16]. Perrotti et al. also reviewed ten cases of pyogenic osteomyelitis involving vertebral bodies and intervertebral disks, in addition to paravertebral and epidural abscesses, with challenging diagnosis [7]. Eight patients were infected by S. aureus, and E. coli or Haemophilus spp were found in other two [7]. Diagnoses were confirmed by MRI, all patients received antibiotics and four of them underwent surgery. More severe outcomes associated with late diagnoses were emphasized by the authors [7]. Park et al. studied 313 cases of vertebral osteomyelitis and found 20.8% by Gram-negative bacteria; patients were mainly diabetic women, and paravertebral abscesses occurred in few number than in osteomyelitis due to S. aureus [8]. Studies about paravertebral abscesses are still scarce, but the incidence seems to be increasing. Initial empiric use of large spectrum antibiotics should be early changed by antibiogram-guided drugs.

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**REFERENCES**


