

Spondylodiskitis Caused by Enterococcus: An Unusual Entity. A Case Report and Literature Review

María Sastre, Inmaculada Ros, Antoni Payeras, Juan Antonio Mas, and Miquel Pericàs

Servicio de Medicina Interna y Unidad de Reumatología, Hospital Son Llàtzer, Palma de Mallorca, Spain.

Spondylodiskitis caused by enterococcus is an entity anecdotally described in medical literature. We report a case of lumbar spondylodiskitis caused by enterococcus faecalis of urinary origin in a male patient after being operated because of prostate benign hyperplasia in the Hospital Son Llàtzer, Palma de Mallorca, Spain. Clinical, radiologic and evolutive features were revised. Through a bibliographical search 9 cases have been found in medical literature, although 2 of them were included in etiologic series of infectious spondylodiskitis with no more information. Together with our case we describe briefly the published characteristics of the 7 patients.

Key words: Spondylodiskitis. Enterococcus. Osteomyelitis.

Espondilodiscitis enterocócica: una entidad inusual. Descripción de un caso y revisión de la bibliografía

La espondilodiscitis por enterococo es una entidad que se describe de forma anecdótica en la literatura médica. Se presenta un caso de espondilodiscitis lumbar por *Enterococcus faecalis* de origen urinario en un paciente varón, tras intervención de hiperplasia benigna de próstata que fue atendido en el Hospital Son Llàtzer. Se revisan las características clínicas, radiológicas y evolutivas de este caso. Al realizar una búsqueda bibliográfica se han encontrado 9 casos comunicados en la literatura médica, aunque 2 de ellos estaban incluidos en series etiológicas de espondilodiscitis infecciosas, sin más información. Se resumen, junto con nuestro caso, las características de los 7 pacientes publicados de los que se dispone de información clínica.

Palabras clave: Espondilodiscitis. Enterococo. Osteomielitis.

Correspondence: Dra. M. Sastre.
Servicio de Medicina Interna y Unidad de Reumatología.
Hospital Son Llàtzer.
Ctra. Manacor, km 4. 07198 Palma de Mallorca. Islas Baleares. España.
E-mail: msastre@hsl.es

Manuscript received August 23, 2005; accepted for publication May 4, 2006.

Introduction

Vertebral osteomyelitis (regardless of which pathogenic microorganisms causes it) has increased its incidents in the last few decades due to a larger number of patients with chronic debilitating illness, immune suppression, as well as a increased frequency of invasive procedures and surgical interventions of the spinal column.^{1,2} Vertebral osteomyelitis is a serious infection that can require prolonged hospitalization, and in determined cases surgical treatment. The most frequent causal agents in vertebral spondylodiskitis in the majority of series published are *Mycobacterium tuberculosis*, *Brucella mellitensis*, and *Staphylococcus aureus*.^{1,2} Enterococcus are responsible for an important number of infectious processes in different localizations, being the most frequent the urinary tract, bacteremia with or without endocarditis, and pelvic or intra-abdominal processes. Nonetheless, spondylodiskitis due to enterococcus is an infrequently described entity. Up to this date there have been 9 communicated cases of spondylodiskitis due to this microorganism.¹⁻⁷ The objective of this work is to describe the new case of spondylodiskitis probably caused by enterococcus, as well as doing a literature review of obligated cases with clinical information available, with special emphasis in data relating to the treatment and prognosis of this disease.

Clinical Case

We present the case of one 79-year-old male, with a history of mechanical back pain after working related lumbar trauma at 48 years of age, who underwent a gastric ulcer repair at 65 and was surgically treated for a benign prostatic hypertrophy in November of 2002 with hematuria as a postsurgical complication. Posteriorly, he presented several episodes of cystitis without systemic manifestations that were treated in an empirical form. On the May, 2003 apart from the clinical manifestations of hemorrhagic cystitis, he presented with malaise, fatigue, and fever (39°C) with chills and attended the emergency department of the hospital. He underwent laboratory testing and urinary sediment examination that confirms a urinary tract infection and underwent blood cultures

and 1 urine culture. It was started on treatment with ciprofloxacin 500 mg/12 h during 10 days. The 2 blood cultures in the urine culture were positive for *Enterococcus faecalis*. Three days after this episode, and showing a discrete clinical improvement, there was a reduction in disuria and urgency of the fever persisted, the patient presenting acute, invalidating lumbar pain without radiation, due to which he once again went to the emergency room and after taking x-rays of the lumbar spine, that showed only agent related changes, was treated with anti-inflammatories and muscle relaxants. The patient was sent to the outpatient rheumatology consult in October 2003, after 5 months of lumbar train of inflammatory characteristics that limited the patient more and more every day, and during the last 20 days was radiated to the gluteus and the posterior face of the right inferior extremity. The patient did not show fever, night sweats, or toxic syndrome during this period of time, and neither had he presented any other episode of cystitis. On physical exploration there was an important limitation of lumbar spinal mobility in all planes, and spinal maneuvers (Neri and psoas) were positive with negative radicular signs (Lasegue and Bragard), and with normal reflexes.

Laboratories tests were normal. Lumbar spine x-rays showed a reduction in the articular space between the second and third lumbar vertebrae, as well as an alteration in the morphology of the vertebral joint facets (Figure 1) that was not evident on the x-rays done on the initial evaluation in the emergency room. Magnetic resonance (MR) showed L2 and L3 spondylodiskitis with minimal pre-vertebral or bilateral psoas muscle affectionation. A bone scan with technetium and gallium confirmed the uptake of the radio marker in the above-mentioned zone. The presence of infectious spondylodiskitis in a patient with no fever, and no systemic affectionation, and the with normal lab results, a biopsy was done on the disc zone where cultures for bacterias, fungi, and mycobacteria (culture, Ziehl-Neelsen, and auramine stain) had been negative, and the pathologic study confirmed the presence of acute inflammation with no atypical findings present. Treatment was started empirically with amoxicillin-clavulanate 2 g/8 h and gentamycin 120 mg/12 h, and posteriorly the amoxicillin-clavulanate was changed to ampicillin 2 g/4 h. After biopsy the patient presented a worsening of clinical signs with fever and an increase in acute phase reactants (ESR 30 and PCR 14) that improved after a week of rest, and the lumbar corset. The patient underwent 6 weeks of intravenous antibiotics treatment with the disappearance of inflammatory pain, and actually persists with discrete mechanical pain. On x-ray control after 3 weeks of antibiotic treatment and after biopsy, the disk space between L2-L3 had fused with a more noticeable sinking of the anterior zone (Figure 2), that was confirmed with a computerized tomography (CT) of the lumbar spine. Clinical and



Figure 1. Lumbar spine x-ray that shows a reduction in disk space between the second and third lumbar vertebrae, as well as a reduction in the morphology of the joint facets.

radiologic evolution showed a resolution of the infectious process. Today, and after 24 months of treatment, the patient is asymptomatic and control x-rays have not been modified.

Discussion

In total, 8 cases of spondylodiskitis due to *Enterococcus* sp. were analyzed, including the one referred above, whose clinical and progression characteristics are outlined in Tables 1 and 2. Two more cases that corresponded to a spondylodiskitis etiology series without a description of their clinical characteristics² were not included in the discusion. Three episodes affected women (cases 2, 5, and 6) and 5 men (cases 1, 3, 4, 7, and 8), with a mean age of 74 years (interval, 64-79 years). The most

commonly associated comorbidity was diabetes in 4 cases, followed by osteoarthritis in 2 and a history of lumbar trauma in 2, with and without fracture, respectively. Only 1 of the patients had been surgically intervened in the zone where the posterior infection occurred (case 5) (Table 1). From the clinical standpoint all patients presented pain in the spinal localization affected (5 lumbar, 2 dorsal, and 1 cervical). In spondylodiskitis—independently of the causal agent—pain is localized and sensibility upon examination of the segments affected is present in at least 90% of patients. In general, the pain is insidious and progresses slowly in 3 weeks to 3 months.⁸ Six patients had fever, 1 mild fever, and only 1 patient did not present a fever. In 2 patients (cases 6 and 7), neurologic signs were the first manifestations, respectively presenting flaccid paralysis and paresthesia of the lower limbs. In this illness, fever and peripheral leukocytosis are absent approximately in 50% of patients, and between 6% and 15% and present sensorimotor neurologic defects.⁸ The focal origin of bone infection was urinary in 4 cases, and the rest were endocarditis, surgical wound infection, catheter infection, and unknown origin (Table 2). In 5 episodes, *E faecalis* was the responsible species,¹⁻⁴ *E raffinosus* was implicated in another,⁷ *Enterococcus* sp.

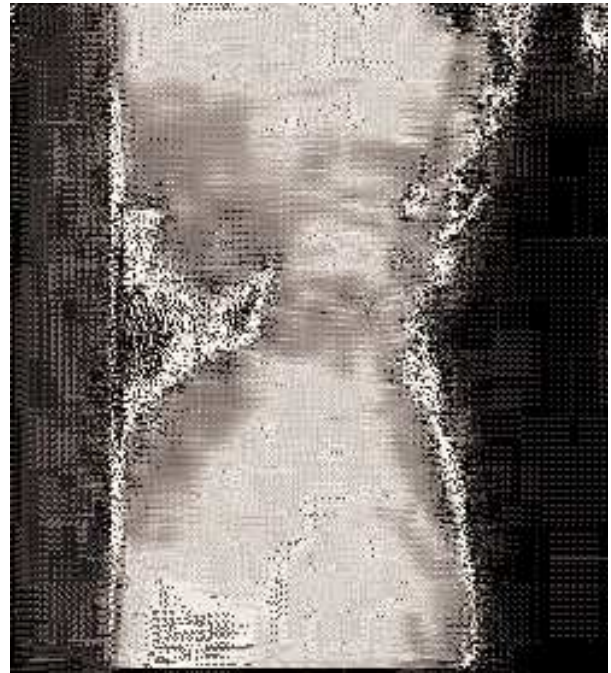


Figure 2. Control x-ray taken at 3 months of antibiotic treatment and alter biopsy that shows a fused L2-L3 disk space and sinking of the anterior zone.

TABLE 1. Clinical Characteristics

Case Number	Age	Gender	Comorbidity	Clinical Data
Case 1 (García et al ¹)	77	Male	Diabetes	Lumbar pain, fever, and chills for 3 weeks
Case 2 (García et al ¹)	75	Female	None	Lumbar pain, fever for 1 month
Case 3 (Zamora et al ³)	73	Male	Diabetes	Dorsal pain, fever
Case 4 (Melzer et al ²)	64	Male	Kidney failure (hemodialysis)	Lumbar pain, fever
Case 5 (Summers et al ⁶)	74	Female	Diabetes, coronary heart disease, osteoarthritis, spondylolisthesis, spinal canal stenosis	Lumbar pain, fever and chills
Case 6 (Sandoe et al ⁵)	73	Female	Rheumatoid arthritis, osteoarthritis, D5 fracture, coronary heart disease	Dorsal pain, fever, flaccid paralysis both legs
Case 7 (Lee et al ⁴)	77	Male	Diabetes	Cervical pain, paresthesia upperlimbs, fever for 4 days
Case 8 (case described)	79	Male	Prostatectomy, lumbar trauma	Lumbar pain for 5 months

TABLE 2. Origin, Responsible Pathogen, Microbiologic and Imaging Diagnosis, and Treatment*

Case Number	Origin (Probable)	Pathogen	Microbiologic Diagnosis	Imaging Diagnosis	Treatment	Evolution
Case 1 (García et al ¹)	Endocarditis	<i>E faecalis</i>	Blood cultures	X-ray, MR	Penicillin and gentamycin (6 weeks), amoxicillin oral (2 weeks)	Cure
Case 2 (García et al ¹)	Urinary	<i>E faecalis</i>	Blood culture, Urine culture	MR	Penicillin and gentamycin (6 weeks) Amoxicillin oral (2 weeks)	Cure
Case 3 (Zamora et al ³)	Urinary infection	<i>E faecalis</i>	Blood culture, Urine culture	CT	Ampicillin and gentamycin	Death
Case 4 (Melzer et al ⁷)	Catheter	MRSA+VRE	Blood culture	MR	Vancomycin and rifampycin; amoxicillin and rifampycin; moxicyllin and gentamycin; vancomycin, amoxicillin, and fusidic acid	Cure
Case 5 (Summers et al ⁶)	Surgical wound	<i>E faecium</i> + <i>S epidermidis</i>	Bone biopsy, surgical wound	MR	Quinupristine-dalfopristine	Cure
Case 6 (Sandoe et al ⁵)	Urinary	<i>E raffinosus</i>	Blood culture + urine culture, bone biopsy	X-ray	Vancomycin and metronidazole	Death
Case 7 (Lee et al ⁴)	Unknown	<i>E faecalis</i>	Blood culture	CT	Ampicillin and gentamycin	Cure
Case 8 (case described)	Urinary	<i>E faecalis</i>	Urine culture, bone biopsy	MR, bone scan	Ampicillin and gentamycin (6 weeks)	Cure

*MRSA indicates methicillin resistant *S aureus*; VRE, vancomycin resistant *Enterococcus*; MR, magnetic resonance; CT, computerized tomography.

resistant to vancomycin and *S aureus* resistant to methylcillin coinfecting another patient,⁵ and, finally, *E faecium* and *S epidermidis* were considered responsible in the last case (case 5). An MR was done in 5 of the 8 described cases, in 2 a CT was done and the other 2 only underwent spinal x-rays. In the majority of patients, a microbiologic diagnosis was done, using blood cultures, urine cultures or both simultaneously. Biopsy was done in only 3 patients (cases 5, 6, and ours) with a microbiologic confirmation of claws into a (5 and 6). Only in the case described was a bone scan undertaken in which an important uptake of technetium in the L2–L3 region was noticed with the rest of a scan being normal. This relation to the treatment received, penicillin, and gentamicin were used during 6 months, followed by 2 weeks of oral amoxicillin in 2 episodes (cases 1 and 2), another 3 (cases 3, 7, and 8), ampicillin and gentamicin (in 1 during 6 weeks and in the other 2 there is no data about the length of treatment), and finally vancomycin and metronidazole (case 6), as well as quinupristine dalfopristine (case 5) in another 2 patients.⁶ In case 4, vancomycin and rifampycin was used but was afterwards changed according to the results of the antibiogram. Of the 8 described cases, 6 evolved to complete recovery and 2 died (cases 3 and 6), one

due to multi-organic failure and the other one to pulmonary thromboembolism and heart failure. In conclusion, spondylodiskitis due to enterococcus is an infrequent entity, and there are very few described cases. The majority of cases present themselves in older patients with comorbidity, most frequently diabetes mellitus. The diagnosis is reached by clinical examination and imaging (x-rays and/or MR) and is confirmed microbiologically in the majority of cases through blood cultures. The infection originated by *E faecalis* (including the case described) constitutes 5 of the 8 cases, and is the most frequently described species. The majority of cases continue want to complete cure, and are only treated with antibiotics, associated with analgesia, anti-inflammatories, and orthopedic corset.

References

- García F, Fernández-Solà A, García Quintana AM, Capdevila JA. Spondylodiskitis caused by *Enterococcus*: an unusual entity (in Spanish). *Enferm Infecc Microbiol Clin*. 1995;13:473-6.
- Calvo JM, Ramos JL, García F, Bureo JC, Bureo P, Pérez M. Osteomielitis vertebral piógena y no piógena: estudio descriptivo y comparativo de una serie de 40 casos. *Enferm Infecc Microbiol Clin*. 2000;18:452-45.
- Zamora A, Florez J, Vidal F, Richard C. More on enterococcal osteoarticular infections: vertebral osteomyelitis. *Br J Rheumatol*. 1997;36:1132-3.

4. Lee, MV, Minotti, A. Acute vertebral osteomyelitis. N Engl J Med. 2003; 348:2525.
5. Sandoe J, Vitherden IR, Settle C. Vertebral osteomyelitis caused by *Enterococcus raffinosus*. J Clin Microbiol. 2001;39:1678-9.
6. Summers M, Misenhimer GR, Antony SJ. Vancomycin-resistant *Enterococcus faecium* osteomyelitis: succesful treatment with quinupristin-dalfopristin. South Med J. 2001;94:353-5.
7. Melzer M, Goldsmith D, Gransden W. Succesful treatment of vertebral osteomyelitis with linezolid in a patient receiving hemodialysis and with persistent methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus* bacteremias. Clin Infect Dis. 2000;31: 208-9.
8. Mandell GL, Douglas RG, Bennett JE. Enfermedades infecciosas: principios y práctica. 5.^a ed. Madrid: Ed. Panamericana; 2002.