Nosocomial spondylodiskitis with epidural abscess and liquoral fistula cured with quinupristin/dalfopristin and linezolid

*Spondilodiscite complicata post-operatoria trattata con streptogramine e oxazolidinoni*

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**INTRODUCTION**

Spondylodiskitis, spinal epidural abscess and meningitis are relatively uncommon but potentially serious postoperative complications of spinal surgery [1-4]. These infections involving the CNS place them among the most serious of hospital-acquired infections with mortality ranges from 5% to 33%, and persistent neurological abnormalities (weakness, paraparesis, paralysis) can be seen in 10% to nearly 50% of cases [5]. The goal of diagnostic evaluation is to identify the organism and determine the extent of infection. The most common aetiological organisms are gram-positive rods: *Staphylococcus aureus*, coagulase-negative staphylococci (more than 50% methicillin-resistant), *Enterococcus* species (with increasing frequency of vancomycin resistance), multidrug resistant gram-negative aerobic bacilli and yeasts [6]. We describe a case of severe nosocomial spondylodiskitis with epidural abscess and liquoral fistula following orthopedic treatment of spinal stenosis.

**CASE REPORT**

In January 1999 a 64-year-old woman with Parkinson’s disease and spinal stenosis underwent decompressive laminectomy of L2-S2 with peduncular fixation from T12 to the sacral region with the Colorado system and posterolateral arthrodesis of the T12-sacral region. During the early postoperative period organ-space infection was diagnosed. Various antibiotic combinations were used for more than two months with cephalosporin, aminoglycosides and glycopeptides, and two surgery revisions were done. Unfortunately, this infection became chronic and 5 months later the infected instrument was removed and methicillin-resistant *S. aureus* was isolated. During the following 52 months extensive antibiotic therapy and four other surgical interventions were performed. In December 2003, she was admitted to our Department with back pain with sacral cerebral spinal fluid fistula without signs of meningitis in paraparesis. Liquor samples revealed the presence of different aerobic pathogens: vancomycin-resistant (MIC >64 µg/ml) and teicoplanin-resistant (MIC >10 µg/ml) *Enterococcus faecium*, methicillin resistant coagulase-negative staphylococci, *Candida albicans*, *Proteus mirabilis* and extended spectrum beta-lactamase producing strains of *Escherichia coli* and *Enterobacter cloacae* (tested by the double-disk method and E-test, assessing cefotaxime, cefazidime and cepodoxime, with and without clavulanate). Anaerobic cultures proved negative. Magnetic resonance image (MRI) of the lum-
bosacral spine showed signs of a L4 and L5 discitis with adjacent osteomyelitis and paraspinal muscle involvement and a liquoral fistula. Parenteral antibiotic therapy with piperacillin/tazobactam, fluconazole, tetracyclines, quinupristin-dalfopristin was started for 50 days and a surgical “curettage” was additionally necessary (tissue samples were culture negative). Subsequently, quinupristin/dalfopristin was replaced by oral linezolid plus fluconazole and meropenem and continued for an additional 100 days. During this period reversible myelosuppression (anaemia) was registered and was corrected with 8 blood units at days 24, 67, 114. Progressively the clinical feature improved, the liquoral fistula finally closed and the erythrocyte sedimentation rate returned to normal. Magnetic resonance imaging of the lumbosacral spine and scanning with $^{99m}$Tc-labelled autologous leukocytes were both negative for infection. On obtaining these results the antibiotic therapy was stopped. Two years later the patient was stable without fever and an MRI confirmed complete regression of spondylodiskitis, epidural abscess and liquoral fistula.

**DISCUSSION**

The most common clinical findings occurring in over 90% of patients with vertebral osteomyelitis and/or discitis and/or epidural abscess includes localized insidious pain and tenderness in the spine area and in approximate decreasing order of prevalence include motor radiculopathy, paraparesis, bowel/bladder dysfunction, sensory deficit, meningismus, and encephalopathy [7]. In hospitalized patients, initial manifestations may be subtle or difficult to detect because of concurrent conditions and fever is present in less than 50% of cases [8]. Following spine surgery if infection occurs an elevation of the ESR is present in more than 90% of cases, whereas the white blood cell count is elevated in less than 50% of patients [9]. Plain spinal radiographs are not sensitive in the diagnosis of disk space infection and spinal epidural abscess. MRI is highly sensitive and essentially non-invasive and allows accurate visualization of the full length of an epidural abscess in addition to any contiguous infectious processes [7, 10]. Nuclear imaging with Gallium 67 scans seems to be a complementary exam to diagnose infection of the spine with high sensitivity and specificity. The microbiological definition remains a pivotal point to sight therapy. The goals of treatment should include eradicating the infection, relieving pain, preserving or restoring neurologic function, and maintaining spinal stability. The treatment of vertebral osteomyelitis requires an initial 4- to 6-week course of antimicrobial therapy. Parenteral antimicrobial treatment may be extended in difficult cases or in cases in which undrained abscesses are being treated and do not resolve after 4 to 6 weeks. Surgical therapy is not necessary in most cases. Surgical debridement should be considered in patients with large paravertebral or epidural abscesses associated with neurologic deficits, when the diagnosis is in doubt even after a CT-guided aspirate, when medical management fails, or when the spine is mechanically unstable.

In this case with severe, chronic spine infection due to polymicrobial multidrug-resistant organisms, the clinical improvement was achieved with specific long-term antimicrobial suppressive therapy. The isolation of so many different pathogens may be due to several reasons:

1) presence of chronic percutaneous drain;
2) long period of infection;
3) many different antibiotic treatments;
4) possible superinfection by endogenous flora from the gastrointestinal tract. Important parameters were clinical features, decline of the ESR, Gallium 67 scans and sequential MRI evaluation [10].

Long-term oral antimicrobial suppression should be continued until there is radiological evidence of bone vertebral fusion. Complete bone remodelling and fusion are complete after 1-2 years. At that time, long-term oral suppression may be discontinued, with a low risk of recurrence. If there is recurrence, the spinal hardware can be removed without compromising the stability of the spine [11]. When vancomycin-resistant *Enterococcus faecium* or other multidrug-resistant gram-positive bacteria are isolated in spinal infection the use of new antibiotics with activity against these pathogens such as streptogramins (quinupristin-dalfopristin) or oxazolidinones (linezolid) are mandatory. In particular, the latter drug is available for intravenous and oral administration and possesses excellent bioavailability, exhibits good penetration in skin and bone, does
not require dosage adjustment in hepatic or renal dysfunction, and is generally well-tolerated with the predominant side effect manifesting reversible anaemia and/or thrombocytopenia. In conclusion, MRI is the most useful technique for diagnosing the infectious spondylitis and/or discitis and/or epidural abscess in the acute phase and when the cure has been obtained and the treatment can be stopped.

Key words: spondylodiskitis, quinupristin/dalfopristin, linezolid

Nosocomial infections after spinal surgery are relatively uncommon but potentially serious. The goal of diagnostic evaluation is to determine the extent of infection and identify the microorganism involved. Neuroimaging provides accurate information on correct topography, localization and propagation of the infection. Microbiological data are able to give aetiological causes.

In this patient with severe, chronic polymicrobial spine infection with epidural abscess and liquoral fistula due to multidrug-resistant organisms, the cure was achieved with long-term antimicrobial specific therapy with quinupristin-dalfopristin (50 days) and linezolid (100 days) with mild side effects. This positive result was due to combined medical and surgical treatment.

SUMMARY

Le complicanze infettive che seguono gli interventi chirurgici a carico della colonna vertebrale pur essendo rare, sono gravate da elevata morbosità e mortalità. Un corretto algoritmo diagnostico dovrebbe portare alla identificazione dell’agente pathogeno e alla precisa valutazione dell’estensione dell’infezione. Le tecniche per immagini, TC e RMN, sono di insostituibile valore assieme ai risultati microbiologici. Si descrive il caso di

REFERENCES