SYSTEMATIC REVIEW

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Spondylodiskitis, etiology, diagnosis and treatment

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Spondylodiskitis is a spinal infection comprising vertebral osteomyelitis and intervertebral disc. Diagnosis can be difficult considering that the symptomatology is not specific, low back pain is common in people over 50 years.

The etiology of the disease includes pyogenic germs, tuberculous, parasitic and fungal etiology. It is known that staphylococcal and tuberculous etiology are responsible for most cases in clinical practice, being the main issue of differential etiological diagnosis. Gram-negative germs are a rarer etiology, being involved in secondary spinal infections as a consequence of dissemination of retroperitoneal or intra-abdominal collections. Other etiologies are very rare: parasitic, fungal or Brucella.

Spinal infection has, in most cases, marrow dissemination as pathogen mechanism; it is recorded in staphylococcal sepsis and secondary determinations of tuberculosis (Pott morbidity).

Contiguous infection from septic foci nearby is a rare complication due to esophageal ruptures or retropharyngeal abscess or aortic vascular prosthesis infections. Iatrogenic, postoperative, postpuncture infection is also recognized.

Due to the particularities of spine vasculature, marrow infection includes intervertebral disc and vertebral body; septic emboli cause infarcts within bones, leading to osteolysis, mechanical deformations, cavitation, mechanical instability. Paravertebral abscesses could occur, the infection can spread into the spinal canal.

The location of these spinal infections is more common in the lower back, however, thoracic and cervical locations are also common.

Initial infectious outbreaks are often difficult to identify, less than 50% of cases are recognized as the source of spondylodiskitis, skin and soft tissue infections, genitourinary infections, respiratory infections, endocarditis, ORL infections. Predisposing factors are recognized and represented by comorbidities, diabetes, rheumatic diseases, cirrhosis, malignancy, immunosuppressive treatments.

Staphylococcus aureus is the most common non-tuberculous etiology, methicillin-resistant Staphylococcus is more and more common in both community infections and in hospital infections. Staphylococcal spondylodiskitis has as starting point, infections of the soft tissues, infections of intravascular devices, infectious endorcaditis and iatrogenic infections: postpuncture, postoperative. MRSA staphylococcus spectrum of resistance comprises lately, besides penicillin, aminopenicillins, 3rd generation cephalosporins and other classes of antibiotics: macrolides, clindamycin, aminoglycosides, florochinolone rifampicin, moreover, the rate of resistant strains is increasing.

Viridans streptococci represent less than 10% of the etiology of spondylodiskitis, their association with bacterial endocarditis in sepsis is known.

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Pneumococcus, anaerobic bacteria represent a rare etiology.

Tuberculosis is a constant presence in the range of spinal infections. As a form of bone tuberculosis, bone cold abscess has a slow, insidious, soundless development and it is sometimes associated with other bacillary determinations: psoas abscess, renal, prostate, lung or even brain abscess.

Gram negative bacteria represent 10-30% of the etiology of spinal infections, the most common germ is Escherichia coli, followed by Proteus, Klebsiella and Enterobater.

Rarely, spondylodiskitis etiology may be represented by other bacteria: Brucella, Bartonella or fungi: candida albicans (more frequently), Cryptococcus, Coccidioides, blastomices. As an exception, cases of spinal infection with Echinococcus granulosus are described.

The difficulty of diagnosis lies in the poor symptoms; lumbar spine pains are common in the general population. Sometimes, the presence of low grade fever or febrile episodes draws attention. Neurologic deficit may occur in complicated cases with radiculopathy and spinal cord compression. During anamnesis, recent history of skin or soft tissue infections, presence of an intravascular device or surgery in the spine is presented. Patients with comorbidities and immunosuppressive treatments are more exposed to the risk of sepsis with secondary determinations. Bacillary etiology is insidious, diagnosis is retroactive.

Laboratory examination raises suspicion of infection when neutrophilic leukocytosis is present, high ESR, CRP is often higher in spondylodiskitis. Alkaline phosphatase may be increased.

Radiological examination and magnetic resonance imaging of the spine brings valuable proofs for diagnosis, showing inflammatory modifications and bone structure modifications of the vertebrae and intervertebral disc, which also appear in degenerative lesions and can therefore be difficult to interpret. Technetium 99 scintigraphy and the one with Gallium 67 can bring sensitive data to support the diagnosis. Computed tomography has good resolution for changes in bone structure, it highlights destruction of vertebral plateaus, bone formation seizure, but MRI is superior in viewing abscesses and lesions in nervous tissue. From the imaging point of view, RM lesions TB are different because the intervertebral disc is not affected but paravertebral abscesses are present, bone destruction.

Proof of infectious etiology can be obtained by biopsy-puncture and culture for aerobic bacteria, anaerobes, mycobacteria and fungi. Blood cultures can have a positive result in about 50% of cases, infection is frequently marrow. Histopathological examination of biopsies can guide diagnosis in bacillary infections but also the differential diagnosis of vertebral bone tumors and metastases.

Complications of the disease are caused by damage to the spinal architecture and mechanics, with neurologic and infectious complications.

Neurological complications can be significant, from the root syndrome up to paralysis. Infectious complications are: paravertebral abscesses, epidural abscesses, secondary meningitis, but also sepsis complications , in the context of which spondylodiskitis was diagnosed.

Treatment is anti-infective, analgesic, immobilization and surgery.

Antimicrobial treatment is injected on the basis of probability criteria or after the results of biopsy or blood culture. Antistaphylococcal antibiotics with broad-spectrum are used depending on the etiological suspicion. In the context of increasing frequency of MRSA staphylococcus, Vancomycin, Linezolid or Targocid is used for minimum 6 weeks. Injectable antibiotic therapy may be continued orally up to 3 months, depending on the disease evolution. For bacillary etiology, tritherapy for 3 months, in the 4th month, the 4th antituberculosis antibiotic is associated, then, the therapy continues with two antibiotics up to 12 months.

The favorable evolution is clinically assessed, especially by clinical evidence of inflammation in normal limits, C-reactive protein and VSH within

normal limits, as well as the course of radiologic imaging, magnetic resonance. If paraspinal, epidural abscesses or neurological injuries secondary to compression appear, surgery is required.

The prognosis is favorable by antimicrobial fair treatment and surgery if necessary, spondylodiskitis mortality is less than 5%. Prompt diagnosis and antimicrobial treatment are essential.

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