

Spondilodiskitler ve Protez İnfeksiyonlarına Yaklaşım

Spondilodiskitler: Etiyoloji, Risk Faktörleri ve Klinik Yaklaşım

Uzm. Dr. Serdar Özer

Spondilodiskitler: Tanı ve Tedavi Yaklaşımları

Uzm. Dr. Ayşe Batırel

Dr.Lütfi Kırdar Eğitim ve Araştırma Hastanesi

Protez İnfeksiyonları: Patogenez, Klinik ve Tanısal Yaklaşım

Doç. Dr. Nadir Şener

Uludağ Ü. Tıp Fakültesi

Protez İnfeksiyonları: Tedavi Yaklaşımları ve Sorunlar

Uzm. Dr. Nuray Uzun

Şişli Etfal Eğitim ve Araştırma Hastanesi

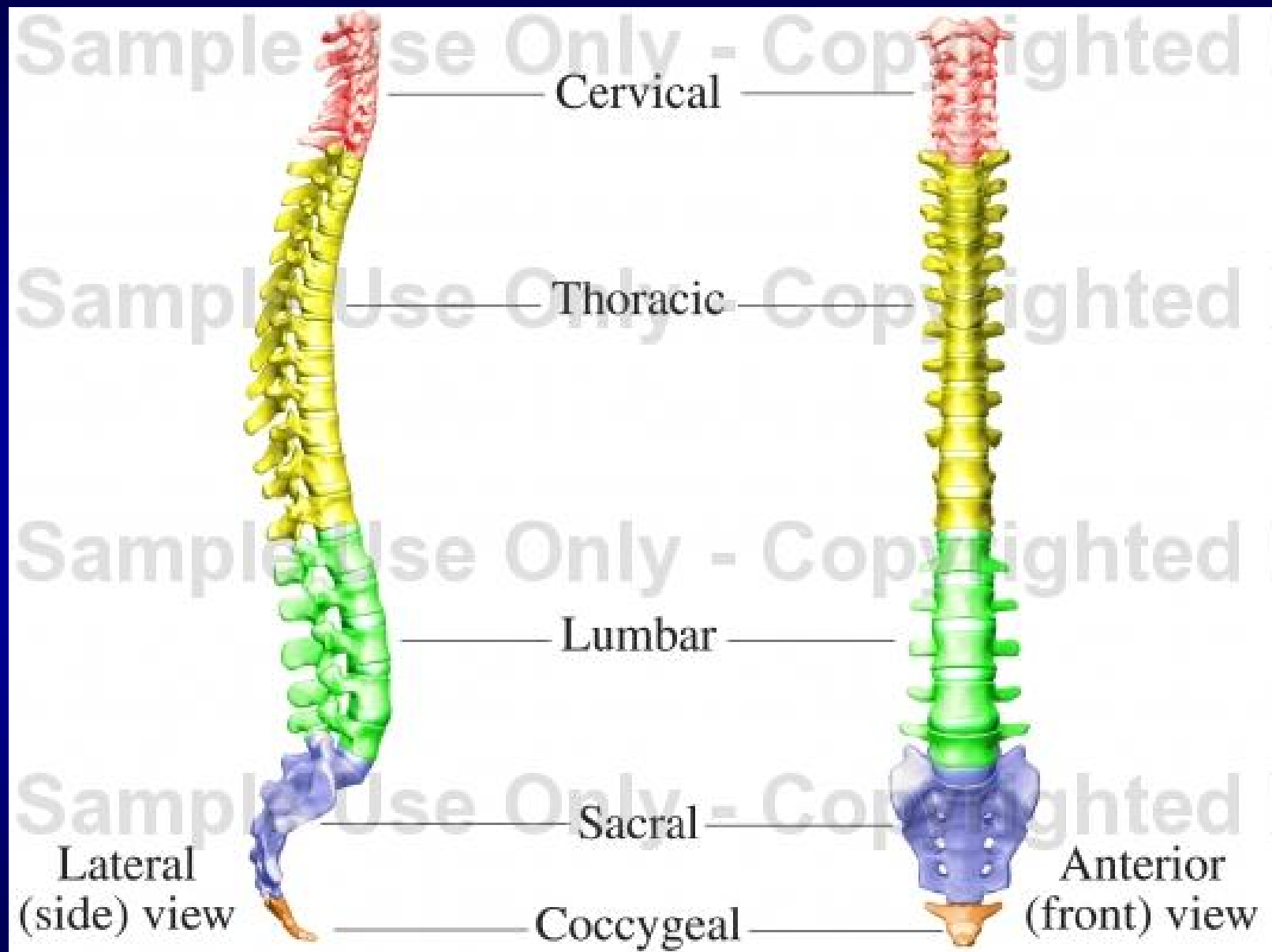
Spondilodiskit

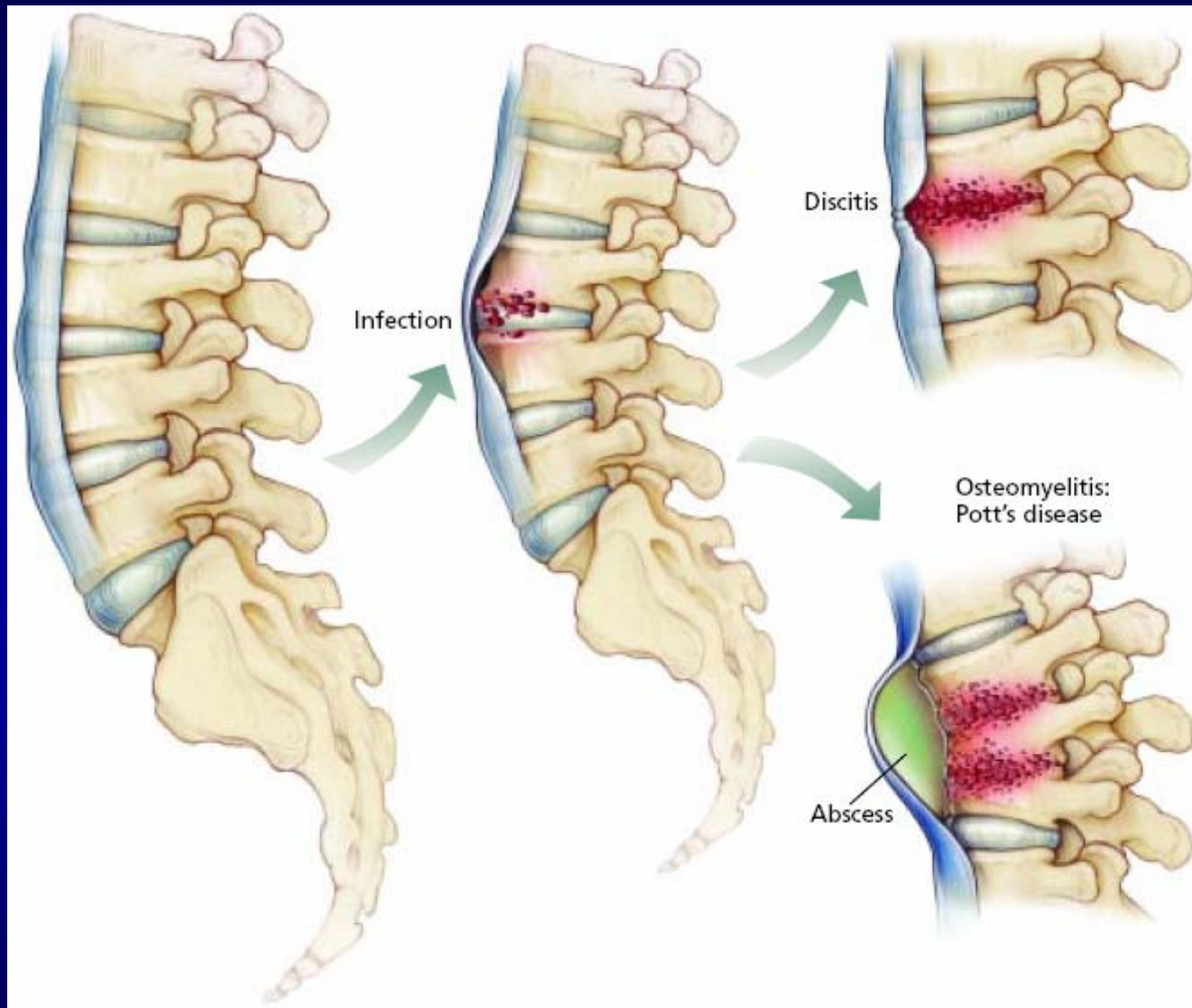
- Spondilodiskit: İntervertebral disk ve komşu vertebraların enfeksiyonu
- Vertebral Osteomyelit (VO) eş anlamlı olarak da kullanılır.
- Olguların bir kısmına Epidural abse veya psoas absesi eşlik edebilir
- Enfeksiyon etkenleri en sık hematogen yolla vertebraya ulaşır (V.segmental arter)

Vertebral Osteomyelitte

Etkenler

- Piyojen bakteriler
- M.tbc
- Brucella
- Fungal etkenler





Spondilodiskitin Önemi ve Sorunlar

- Önemi : Ciddi morbidite (sekel, nörolojik sorunlar....), mortalite nedeni
- SORUNLAR: Uzun süreli yatarak parenteral antibiyotik kullanımı, yatak işgali, pahalı, invaziv tanısal yöntemler, cerrahi tedavi gereksinimi ve sonrasındaki sorunlar...

İnfeksiyon kaynakları

- Cilt ve yumuşak doku infeksiyonları
- Genitoüriner sistem infeksiyonları
- Solunum sistemi infeksiyonları
- İnfektif endokardit veya diğer nedenlere bağlı bakteremiler

Vertebral Osteomyelitis: Long-Term Outcome for 253 Patients from 7 Cleveland-Area Hospitals

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We report a retrospective study of 253 patients with vertebral osteomyelitis (VO) who had long-term follow-up. Eleven percent of the patients died, residual disability occurred in more than one-third of the survivors, and relapse occurred in 14%. Median duration of follow-up was 6.5 years (range, 2 days to 38 years). Independent risk factors for adverse outcome (death or qualified recovery) were neurologic compromise, time to diagnosis, and hospital acquisition of infection ($P \leq .004$). Surgical treatment resulted in recovery or improvement in 86 (79%) of 109 patients. Magnetic resonance images (110 patients) were often obtained late in the course of infection and did not significantly affect outcome. Often, relapse developed in individuals with severe vertebral destruction and abscesses, appearing some time after surgical drainage or debridement. Recurrent bacteremia, paravertebral abscesses, and chronically draining sinuses were independently associated with relapse ($P \leq .001$). An optimal outcome of VO requires heightened awareness, early diagnosis, prompt identification of pathogens, reversal of complications, and prolonged antimicrobial therapy.

CID 2002;34:1342-1350

Etyoloji ile ilgili değerlendirmeler:

- Kesin mikrobiyolojik tanı: Vertebradan izole edilen mikroorganizma
- Muhtemel mikrobiyolojik tanı: 2 kan kültürü pozitifliği
- Olası mikrobiyolojik tanı: Vertebral sinus traktından alınan kültürde üreme

Etyolojik sonuçlar:

<u>Etken</u>	<u>Epizod</u>	<u>Kesin</u>	<u>Muhtemel</u>	<u>Olası</u>
<i>S.aureus</i>	123	76(62)	42(34)	5(4)
KNS	17	10(59)	6(35)	1(6)
GNEB	59	39(66)	18(31)	2(3)
Streptekok	24	12(50)	11(46)	1(4)
Polimikrobial	20	15(75)	4(20)	1(5)
Diğer	12	10(83)	2(17)	0

Risk faktörleri:

- DM %31 (79)
- Alkolizm %11 (29)
- Kanser % 4
- Kollagen Vasküler H %4
- Siroz %4
- Renal Hastalık %4
- IV ilaç Kullanımı %4

Kötü prognoz kriterleri:

- Tanının geç konması
- Nörolojik komplikasyon gelişmesi
- Hastanede kazanılma
- Altta yatan hastalık varlığı

Vertebral Osteomyelitis at a Norwegian University Hospital 1987–97: Clinical Features, Laboratory Findings and Outcome

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Altogether 40 patients aged 13–91 y (average 58 y) with vertebral osteomyelitis were treated at the Bergen University Hospital between July 1987 and June 1997. All patients presented with back pain, 33 (83%) had vertebral tenderness, and 26 (65%) patients were febrile. The duration of symptoms before diagnosis was <3 weeks in 13 patients, and from 3 to 16 weeks in the remaining 27 patients. C-reactive protein (CRP) level and erythrocyte sedimentation rate (ESR) were elevated in 39 and 38 patients, respectively. *Staphylococcus aureus* was the most frequent cause of osteomyelitis followed by *Streptococcus* spp., *Escherichia coli* and *Mycobacterium tuberculosis*. Magnetic resonance imaging was superior to other radiological methods and demonstrated changes consistent with osteomyelitis in all 23 patients examined with this method. 35 patients survived. 18/35 surviving patients had pareses and 17 underwent surgery with drainage of abscesses or laminectomy. All 35 patients made a good recovery and only 3 patients experienced permanent pareses. The diagnosis of vertebral osteomyelitis is easily missed, and treatment is often delayed, particularly in the elderly in whom signs of sepsis may not manifest. However, persisting localized pain and tenderness over the spine together with elevated CRP and ESR should prompt the physician to consider vertebral osteomyelitis. Fever and leukocytosis may support the diagnosis, but may not always be present.

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Scand J Infect Dis 30:147-151, 1998

40 hastanın analizinde:

Risk faktörleri:

4 olgu DM, 4 olgu steroid kullanımı, 3 olgu RA,
2 olgu IV ilaç bağımlılığı

Klinik bulgular:

Sırt, bel ağrısı %100, vertebral hassasiyet %83,
ateş %65, bacak adalelerinde zayıflık %47,
paralizi %10

Hematojen yayılım için olası odak toplam 19 olguda
(%47):cilt, üriner infeksiyon, kolanjit,
divertikülit, sinuzit, periodondit, endokardit

Mikrobiyolojik sonuçlar:

S.aureus.....19

E.coli.....4

M.tb.....2

H.influenza..1

Streptokok...4 (GrupA,B,C,)

Epidemiology of acute vertebral osteomyelitis in Denmark

137 cases in Denmark 1978–1982, compared to cases reported to the National Patient Register 1991–1993

Michael R Krogsgaard¹, Peter Wagn² and Jørgen Bengtsson³

We studied the epidemiology of acute, non-tuberculous, hematogenous vertebral osteomyelitis in Denmark during 1978–1982. 137 patients fulfilled the criteria for acute vertebral osteomyelitis. The incidence was 5/mill/year. There were no cases in the age group 20–29 years. The highest incidence was between 60–69 years (18/mill/year). The prevalence was 15 cases. The mean duration of the disease was 7 months. The lumbar spine was affected in 59%, the thoracic spine in 33% and the cervical spine in 8% of the cases. Insulin-dependent diabetes and treatment

with systemic corticosteroids seemed to be significant risk factors, but not rheumatoid arthritis and abuse of alcohol or intravenous drugs. We found no demographic variables of importance for the incidence. In 46%, a primary focus was identified, urinary tract infection being the commonest. According to the National Patient Register 1991–1993, the relative number of reported patients with vertebral osteomyelitis had increased in the age group 20–49 years, compared to 1978–1982, but the incidence was highest in the group aged 60–79 years.

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- **İnsidansı en yüksek grup 60-79 arası**
- **Tutulan vertebra seviyesi:**
 - % 59 lomber**
 - % 33 torakal**
 - % 8 servikal**
- **Risk faktörleri:**
 - DM (17), steroid kullanımı (10), alkolizm (9), RA (4)**
- **Olası primer infeksiyon odağı:**
 - Üriner inf. %18 (24)**
 - Subcutan abse %7 (10)**
 - Akciğer inf. %7 (9)**
 - İnfekte operasyon yarası %3 (2)**
 - Endocardit %2 (3)**

Vertebral osteomyelitis in northern Spain. Report of 62 cases

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Abstract

Objective

The records of 62 patients with clinical and radiographic evidence of vertebral osteomyelitis and positive bacteriological diagnosis, seen between 1979 and 1996, were reviewed in order to gather data on the epidemiology and the clinical pattern displayed by patients with this condition in northern Spain.

Results

Staphylococcus aureus (15 cases), Mycobacterium tuberculosis (15 cases) and Brucella melitensis (13 cases) were the microorganisms most frequently found in our patient series. After improvement of the sanitary and hygienic control of food products, the role of Brucella melitensis is decreasing as a causative agent (only 3 cases in the last 6 years). Staphylococcus epidermidis, present in 4 cases (6.6%), should be suspected in elderly patients with previous intravenous cannulations (3 of 4 cases).

The most frequent risk factors were alcoholism (7 cases), chronic hepatic disease (7 cases), diabetes (6 cases) and previous surgery (6 cases). Delay in diagnosis was high (the mean number of days between the onset of symptoms and diagnosis was 125). The lumbar region was the most commonly affected site. Neurologic involvement was present in 10 patients on admission (16%). ESR was > 50 mm/hr in a high number of cases. Blood cultures were found to be the most valuable routine test. Plain x-rays were normal in 10 patients (16%); in 6 of them Staphylococcus aureus was the responsible organism. Other imaging modalities showed a high sensitivity. Surgical drainage was necessary in 12 individuals (in 7 due to Mycobacterium tuberculosis). Outcome was good in the majority of cases: only 2 patients with associated endocarditis died. Neurologic sequelae were present in another 3 patients.

Conclusion

Vertebral osteomyelitis can be caused by a variety of pathogens. Therefore, bacteriological studies are necessary to establish the etiologic diagnosis and determine the specific antimicrobial treatment required.

Key words

Vertebral osteomyelitis, Staphylococcus aureus, Mycobacterium tuberculosis, Brucella melitensis.

- 1979-1996 yılları arasında 103 olgudan 62'sinde etken patojen tanımlanmış
- Yaş ortalaması: 57
- Erkek hasta %60
- Tanı koyma süresi: ort. 125 gün
- Risk faktörleri: alkolizm 7, KKcH 7, DM 6, Cerrahi işlem 6, IV kanül 3, Renal yetmezlik 2, Kanser 2, HIV inf. 3
- Klinik bulgular:
 - ağrı % 71
 - ateş % 66
 - nörolojik tutulum %16

Mikrobiyolojik sonuçlar:

S.aureus 15

M.tbc 15

Brucella 13

E.coli 7

Streptokok 5

KNS 5

Pseudomonas 1

E.coli –Proteus 1

Piyojen Bak % 55, Tbc % 24, Brucella % 21

Pyogenic, tuberculous, and brucellar vertebral osteomyelitis: a descriptive and comparative study of 219 cases

J D Colmenero, M E Jiménez-Mejías, F J Sánchez-Lora, J M Reguera, J Palomino-Nicás, F Martos, J García de las Heras, J Pachón

J D Colmenero, M E Jiménez-Mejías, F J Sánchez-Lora, J M Reguera, J Palomino-Nicás, F Martos, J García de las Heras, J Pachón

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- **Risk faktörleri: DM, IDU, bakteremi, immüno Kompromize konak (Piyojenik VO çok belirleyici)**
- **Kan kültürü: PVO'li hastalarda % 41.8, BVO hastalarda ise % 41.4 gibi yararlı olmuş**
- **PVO en sık etken *S.aureus*, GNEB , anaerobik bakteriler**
- **BVO kemik biyopsisine gerek duyulmamışken, TVO % 75, PVO % 50 biyopsi gerekmiş.**

Sonuçlar:

- % 48 BVO
- % 33 PVO
- % 19 TVO
- Nötrofili, ESR ve CRP yüksekliği, önceki infeksiyon, immünsüpresyon, IV ilaç kullanımı, DM → PVO destekler
- Uzamış klinik, torasik vertebra tutulumu, ateş yokluğu, spinal deformite, nörolojik defisit, paravertebral, epidural yayılım, psoas absesi, PPD pozitifliği → TVO destekler

- Kan kültür pozitifliği, Brusella için serolojik testler (STA), bruselloz için endemik bölgede oturma → BVO için önemli destek
- % 54 medikal tedaviye yanıt alınmışken % 46 olguda cerrahi tedavi ihtiyacı duyulmuş.

Vertebral Osteomyelitis in Göteborg, Sweden: A Retrospective Study of Patients During 1990–95

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Vertebral osteomyelitis (VO) is a rare condition and the diagnosis is often overlooked initially. Delay in diagnosis may result in vertebral destruction or perforation of the spinal canal. We suggest diagnostic criteria in order to simplify the diagnosis and classification of VO. Medical records of 58 patients with VO from Göteborg during the years 1990–95 were studied retrospectively. The incidence, clinical presentation, microbiology and treatment of VO were evaluated. The median age at the time of admission was 59 y (range 13–83 y) and the male:female ratio was 1.6:1. The incidence was 2.2/100,000 inhabitants/y. Sixty-four percent of the patients were natives of Sweden. The patients were classified as definite (67%), probable (26%) and possible (7%) VO. *Staphylococcus aureus* was the most common infective agent (34%), followed by *Mycobacterium tuberculosis* (27%). The most common risk factors included recent or current infections, immunosuppressive diseases and previous surgery. CRP and ESR were elevated in 82% and 88% respectively and plain X-ray changes indicating VO were found in 56% of the patients. Radiological changes were found in 34/44 (77%) computerized tomography scans and 10/13 (77%) magnetic resonance imaging examinations. The median duration of intravenous and oral antibiotic treatment were 10 and 179 d respectively. A delay of > 1 month from the onset of symptoms until diagnosis was found in 38% of the patients. This indicates the need for a standardized protocol for diagnosing VO. In this paper we suggest diagnostic criteria, which have not previously been available.

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- Eşlik eden hastalıklar ve risk faktörleri:
Yeni geçirilen veya halen geçirilmekte olan hastalık (cilt, yumuşak doku, pnömoni, endokardit, sepsis, postop komplikasyonlar), DM, Kollajen vasküler hast, steroid kullanımı, monoklonal gamapati, interferon kullanımı, IV ilaç, alkol bağımlılığı, vertebraya met., yakın zamanda operasyon

Mikrobiyolojik sonuçlar:

- *S.aureus* (sıklıkla DM ve immunsüpresyonlu hastalarda)
- *M.tb* (Sıklıkla Afrika kökenlilerde)
- *E.coli* (GNEB nedeni: üriner infeksiyonların yetersiz tedavisi!)
- Dikkat: Endokarditi takiben sırt,bel ağrıları VO yönünden önemsenmeli!

Brusellar VO

- Brusellozun en önemli ve en sık görülen komplikasyonu osteoartiküler tutulumudur.
- Kronik dönemde görülür.
- Akdeniz çevresi ve Güney Amerika dünyada en sık görülen alanlar

BVO Klinik

- Bel ve sırt ağrısı
- Subfebril ateş
- Duyu kayıpları
- Motor kayıplar ve adele zayıflığı (torakal tutulumda daha sık)
- Genellikle lomber vertebralar tutulur, paraspinal abse olguların bir kısmında oluşabilir.

Tüberküloz VO

- Tüberkülozun endemik görüldüğü ülkelerde genellikle gençlerde, gelişmiş ülkelerde ise yaşlılarda daha sıktır.
- Sistemik belirti ve bulgular az, sıklıkla tb odağına rastlanmaz.
- Genellikle torakal vertebraları tutar, lomber ve sakral ve servikali az sıklıkla etkiler.
- Torakal 2 vertebrada anterior superior yerleşimli kamalaşması, intervertebal diskin harabiyeti klasik görünüm
- Klinik: sırt ağrısı ve adele sertliği, takiben deformite ve paralizi , Psoas absesi (%50 olguda gelişir)

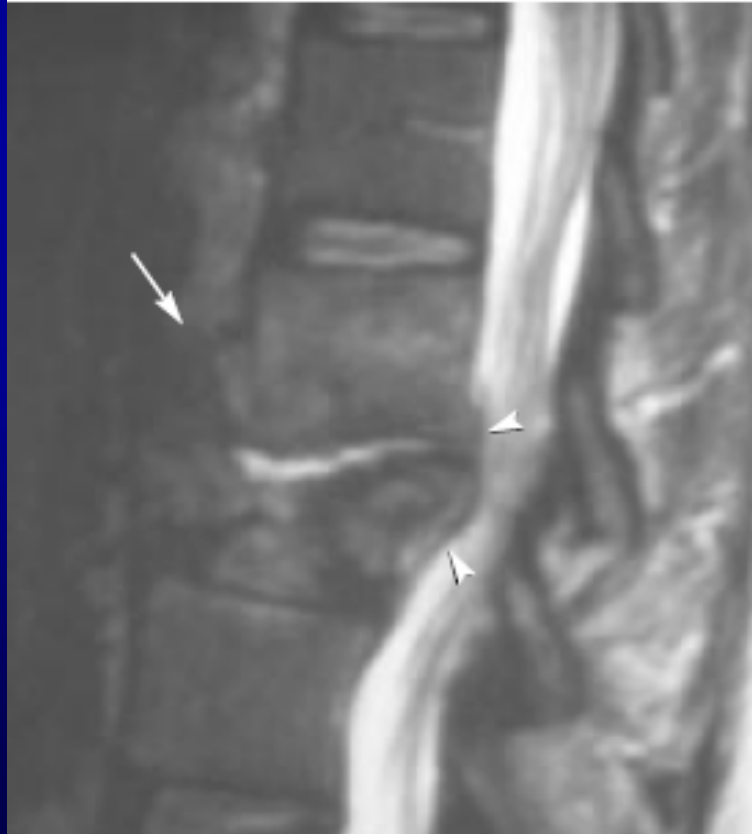
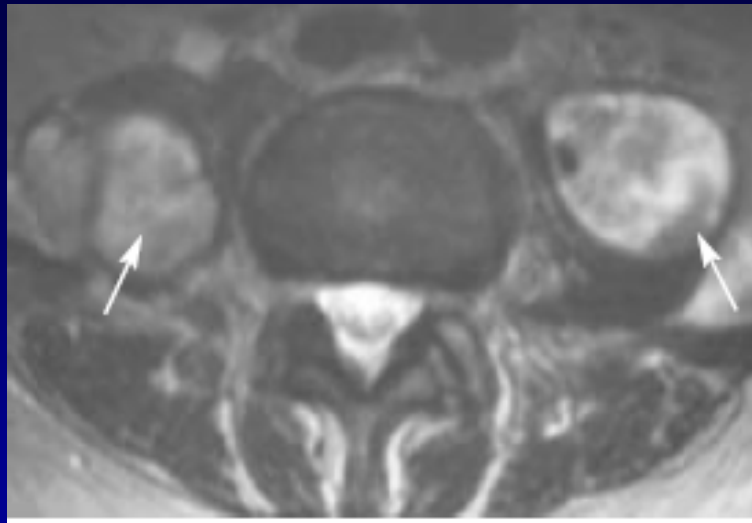


FIGURE 2. TOP, magnetic resonance imaging (MRI) in our patient demonstrates bilateral psoas abscesses, contiguous with granulomatous abscess of the vertebral body. BOTTOM, MRI in the sagittal view demonstrates anterior abscess (arrow), segmental instability, and epidural compression (arrowhead) due to abscess and vertebral fragments. This patient had quadriceps and dorsiflexor weakness on the left side. Before surgery could be planned she became obtunded, then manifested seizures and cranial nerve palsies with the onset of tuberculous meningitis. Despite immediate support and quadruple antibiotic therapy, the patient suffered an infectious injury to the visual cortex which rendered her blind.



FIGURE 1. Plain radiograph of a 48-year-old woman with 3 to 4 weeks of mild and 1 week of intense low back pain. The classic Pott deformity results from destruction of the L3 vertebral body (arrow) and obliteration of the L2–3 intervertebral disc (arrowheads).

Fungal Vertebral Osteomyelitis

- Candidal Vertebral Osteomyelitis
- Aspergillus Vertebral Osteomyelitis

İnvaziv Fungal İnfeksiyonlarda Risk Faktörleri

- Santral IV kateterizasyon
- İnvaziv prosedürlerdeki artış
- İmmünsupresif tedavi
- GSA kullanımındaki artış

Candidal Vertebral Osteomyelitis: Report of 6 Patients, and a Review

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The incidence of deep-seated candidal infection is increasing, but candidal vertebral osteomyelitis is still rare. We describe 6 patients recently treated in our hospital. Conservative treatment failed in all. We reviewed the literature and identified 59 additional cases of candidal vertebral osteomyelitis. Candidemia was documented in 61.5% of them. The interval between the diagnosis of candidemia and the onset of symptoms of vertebral osteomyelitis varied widely, from days to >1 year. In patients without documented candidemia, there was a similar interval between the occurrence of risk factors for candidemia (present in 72% of the patients) and the onset of symptoms of vertebral osteomyelitis. Clinical, laboratory, and radiological findings are not specific for candidal spondylodiskitis. Final diagnosis is determined by means of culture of a biopsy specimen from the infected vertebra or disk. Treatment consisted of prolonged antifungal treatment, and it often included surgery. On the basis of our experience (for all 6 patients, initial conservative treatment with only antifungals failed), we recommend consideration of early surgical debridement in combination with prolonged antifungal therapy.

Mikrobiyolojik sonuçlar:

- C.albicans.....% 61
- C.tropicalis.....% 23
- C.glabrata.....% 9
- C.parapsilosis...%5

Risk faktörleri dağılımı:

- **GSAK37**
- **CIVC.....33**
- **Major Cerrahi.....28**
- **Parenteral Beslenme.....17**
- **Nötropeni, steroid, radioterapi...23**

Spinal Aspergillus Osteomyelitis

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School of Medicine, Detroit, Michigan*

Aspergillus species are uncommon etiologic agents of vertebral osteomyelitis. We describe two patients with lumbar vertebral aspergillosis precipitated by the use of corticosteroids and review 39 cases in the literature. The mean age of the population was 40.04 years. There was male predominance (78% of cases), mainly lumbar involvement (53.7%), and monomicrobial nature of infection; 65.8% of the patients had predisposing factors, while 34.1% had none. Back pain (53.6% of cases) was the predominant symptom, while neurological deficits were present in 29.2% of the patients. White blood cell counts were elevated in 12.2% of the patients, and erythrocyte sedimentation rates were >40 mm/h in 39%. The overall recovery rate was 68.3%, and the mortality rate was 26.8%. Although aspergillus osteomyelitis is primarily treated medically, certain cases may require surgical intervention.

CID 1999;28:1223-1229

Sonuçlar:

- 1966 - 1998 tarihleri arasında 39 olgunun % 66'sında risk faktörleri:
 - % 19.5 Granülosit fonksiyon bozukluğu
 - % 17 Kanser veya kemoterapi veya transplant sonrası
 - % 19.5 Pulmoner infeksiyon
 - % 17 Steroid kullanımı

- Lokalizasyon:
 - % 54 lomber vertebra
 - % 46 torakal vertebra
 - % 22 çoklu kemik, eklem, spinal tutulum
- Etkenler:
 - A.fumigatus* % 71
 - A.nidulans* % 7
 - A.flavus* % 7
 - A.niger* % 2.4
- Klinik:
 - Bel ve sırt ağrısı % 54
 - Başlangıçta nörolojik defisit % 29

Vertebral *Aspergillus* Osteomyelitis and Acute Diskitis in Patients With Chronic Obstructive Pulmonary Disease

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Aspergillus osteomyelitis of the spine with acute diskitis has been well documented in immunocompromised hosts but is rare in immunocompetent patients. Predisposing factors to infection are prolonged neutropenia, hematologic malignancies, chemotherapy, history of prior spinal trauma or surgery, allograft transplantation, or any condition requiring the use of long-term immunosuppressive agents or systemic corticosteroids. Patients with chronic obstructive pulmonary disease (COPD) treated with systemic corticosteroids for either long-term management or frequent exacerbations are at potential risk for such infections. Patients with severe COPD treated primarily with inhaled corticosteroids are considered immunocompetent. This report describes 2 cases of *Aspergillus* osteomyelitis

with acute diskitis in apparently immunocompetent patients with COPD who, aside from brief courses of systemic corticosteroids, were using inhaled corticosteroid therapy. One patient was treated with intravenous amphotericin B alone, whereas the other received amphotericin B and underwent surgical débridement. Both have done well and were symptom free at 6-month follow-up.

Mayo Clin Proc. 1999;74:579-583

ABLC = amphotericin B lipid complex; AIDS = acquired immunodeficiency syndrome; CBC = complete blood cell count; COPD = chronic obstructive pulmonary disease; CT = computed tomographic; HIV = human immunodeficiency virus

Mayo Clin Proc 1999;74:579-83

**Tablo 1. Vertebral Osteomyelitli Olgularımızın
Demografik ve Klinik Özellikleri**

	n=60	%
Yaş (medyan)	54	(14-72)
Kadın	24	(40)
Erkek	36	(60)
Ateş yüksekliği	18	(30)
Lökositoz	8	(13)
ESH yüksekliği	60	(100)
CRP yüksekliği	53	(88)
Paravertebral tutulum	29/46*	(63)

*: BT/ MR ile görüntüleme yapılan olgular içinde

Tablo 2. Spondilodiskitli olgularımızın etkene göre dağılımı

	n=60	%
Brusellar VOM	31	(52)
Tüberküloz VOM (Pott Hst.)	19	(32)
Pyojenik VOM	10	(16)

**Tablo 3. Vertebral osteomyelitli olgularımızın
semptom ve bulguları**

Semptom-Bulgu	n=60	%
Vertebral ağrı		
Bel ağrısı (Lomber ağrı)	52	(88)
Sırt ağrısı (Dorsal ağrı)	10	(16)
Ateş	18	(30)
Bacak ağrısı	10	(16)
Sakroiliak eklem ağrısı	9	(15)
Yürüme güçlüğü	8	(13)
Kilo kaybı	7	(12)
Gece terlemesi	6	(10)

Tablo 4. Olgularımızda yatışın 1. gününe ait ESH (Eritrosit Sedimentasyon Hızı), CRP (C-Reaktif Protein) ve lökosit sayısının minimum, ortalama ve maksimum değerleri

	Min.	Ort.	Maks.
ESH (mm / sa)	20	77	150
CRP (mg / L)	3	32	187
Lökosit (/ mm ³)	3700	6700	16900

Tablo 5. Spondilodiskitli olgularımızda tutulan vertebra seviyeleri

	n=46	%
Lomber	23	(50)
Torasik (Dorsal)	12	(26)
Lomber +Dorsal	7	(15)
Lomber +Sakral	4	(9)

n=BT veya MR ile görüntüleme yapılan olgu sayısı

**Tablo 6. Vertebral Osteomyelitli Olgularımızda
Kültürde İzole Edilen İnfeksiyon Etkenleri**

	n
<i>Brucella spp.</i>	6
<i>Mycobacterium tuberculosis</i>	2
<i>Escherichia coli</i>	1
<i>Pseudomonas aeruginosa</i>	1
<i>Staphylococcus aureus</i>	1

Tablo 7. Vertebral osteomyelitli olgu serilerinin etkene göre dağılımı

	Toplam olgu sayısı (n)	Brusellar VOM	Tüberküloz VOM	Pyojenik VOM
Colmenero JD ve ark. (3)	219	105 (%48)	42 (%19)	72 (%33)
Buranapanitkit ve ark. (4)	101	-	67 (%66)	34 (%34)
Calvo JM ve ark. (5)	40	10 (%25)	17 (%42.5)	13 (%32.5)

