# Beyin Apseleri

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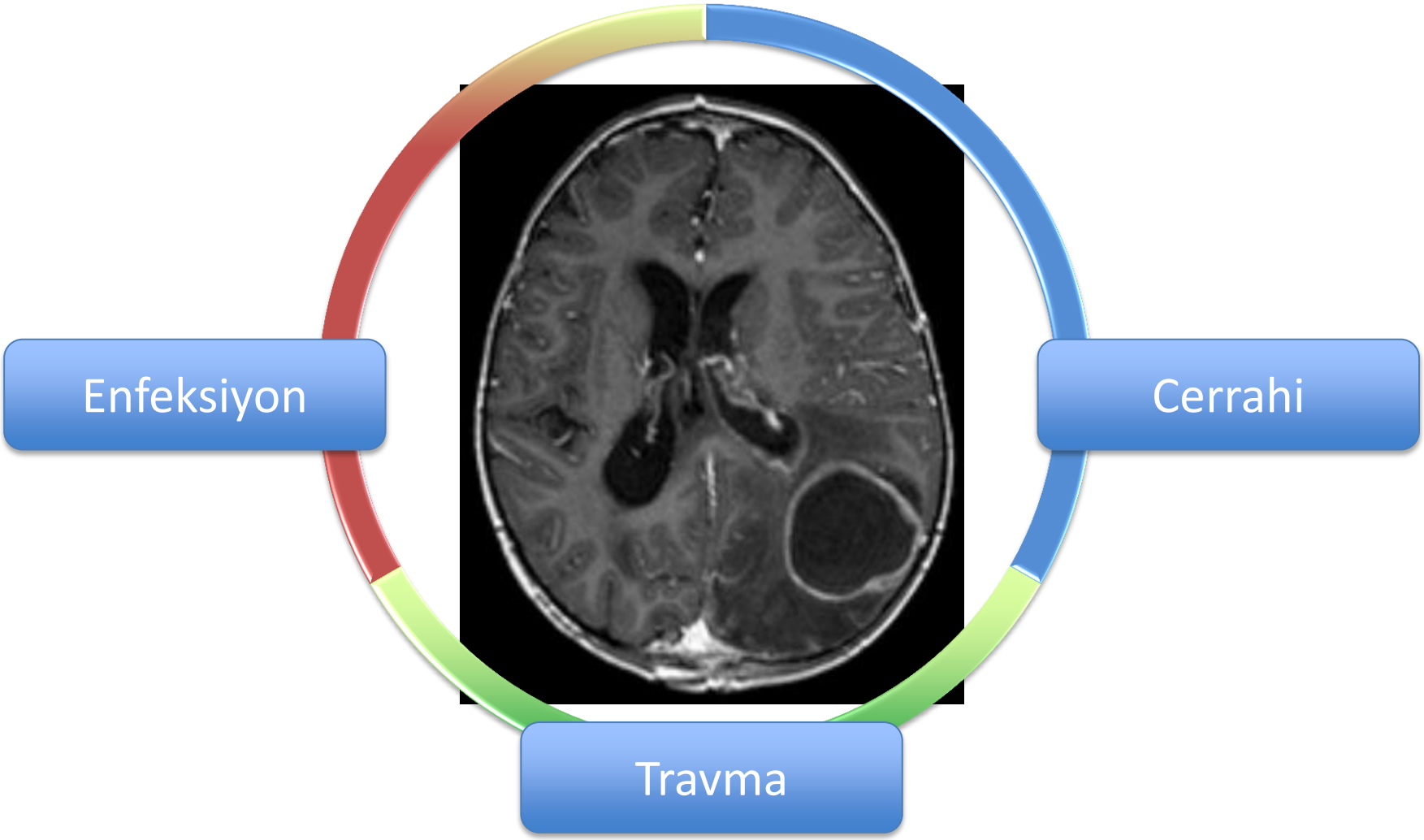
Atatürk EAH.

İZMİR KÂTİP ÇELEBİ ÜNİVERSİTESİ TIP FAKÜLTESİ

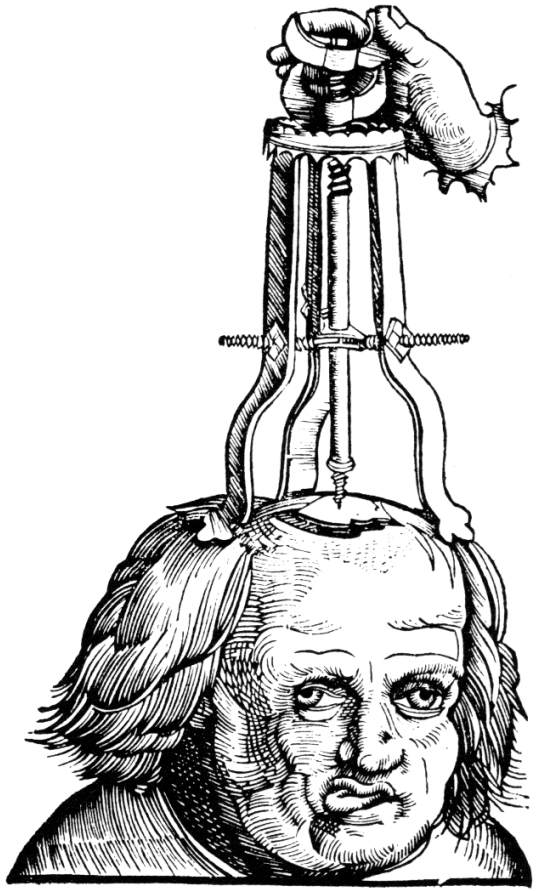

Enfeksiyon
Cerrahi
Travma

# Tarihçe

- Trepanasyon
- İlk cerrahi girişim
- Neolitik dönemde tüm insan topluluklarında gösterilmiş

# Tarihçe

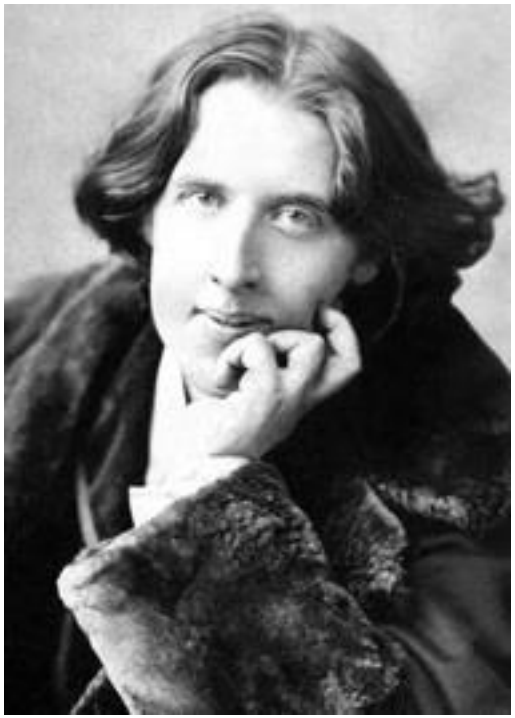
- Nedenleri ??
- En azından bir kısmı tıbbi gerekçelerle
- Parankim lezyonları ??



# Tarihçe

- Fransa kralı II. Henry (1519-1549)
- Kızının düğün töreni sırasında mızrakla yaralanmış
- Göz yaralanması sonrası BA
- Yabancı cisim
- 10 gün sonra hayatını kaybetmiş

- Oscar Wilde
- 1854-1900
- Otojenik kökenli BA nedeniyle hayatını kaybetmiş



- Cemil Paşa (Topuzlu) (1866-1958)
- Ülkemizde modern cerrahinin kurucusu
- 1891
- Depresyon fraktürü sonrası BA
- Geçici anestezinin uygulandığı ve enfeksiyonun cerrahi teknikle başarıyla tedavi edildiği ilk vaka
- Ülkemizden yapılan ilk uluslararası nöroşirurjik bildiri

# Beyin Apseleri

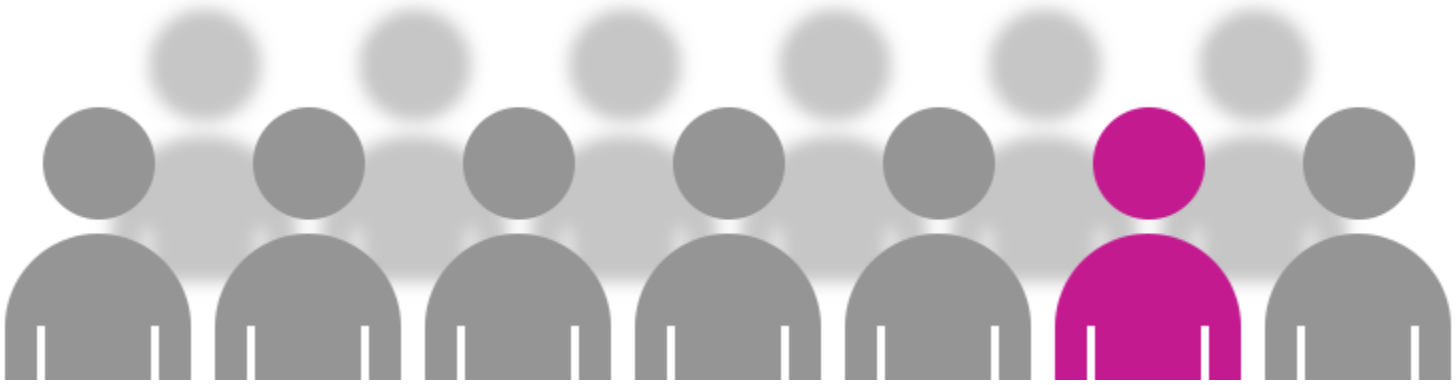
- Tıptaki gelişmelere rağmen yüksek mortalite oranlarıyla seyreden önemli bir klinik sorun
  - Bakteri
  - Mikobakteri
  - Mantar
  - Parazit
- İnsidans 0.4-0.9 /100 bin
- İmmunsupresiflerde oranlar yüksek


Brouwer et al. Brain Abscess. The new England journal of medicine. 2015

# Epidemiyoloji

Erkeklerde 2-3 kat daha sık

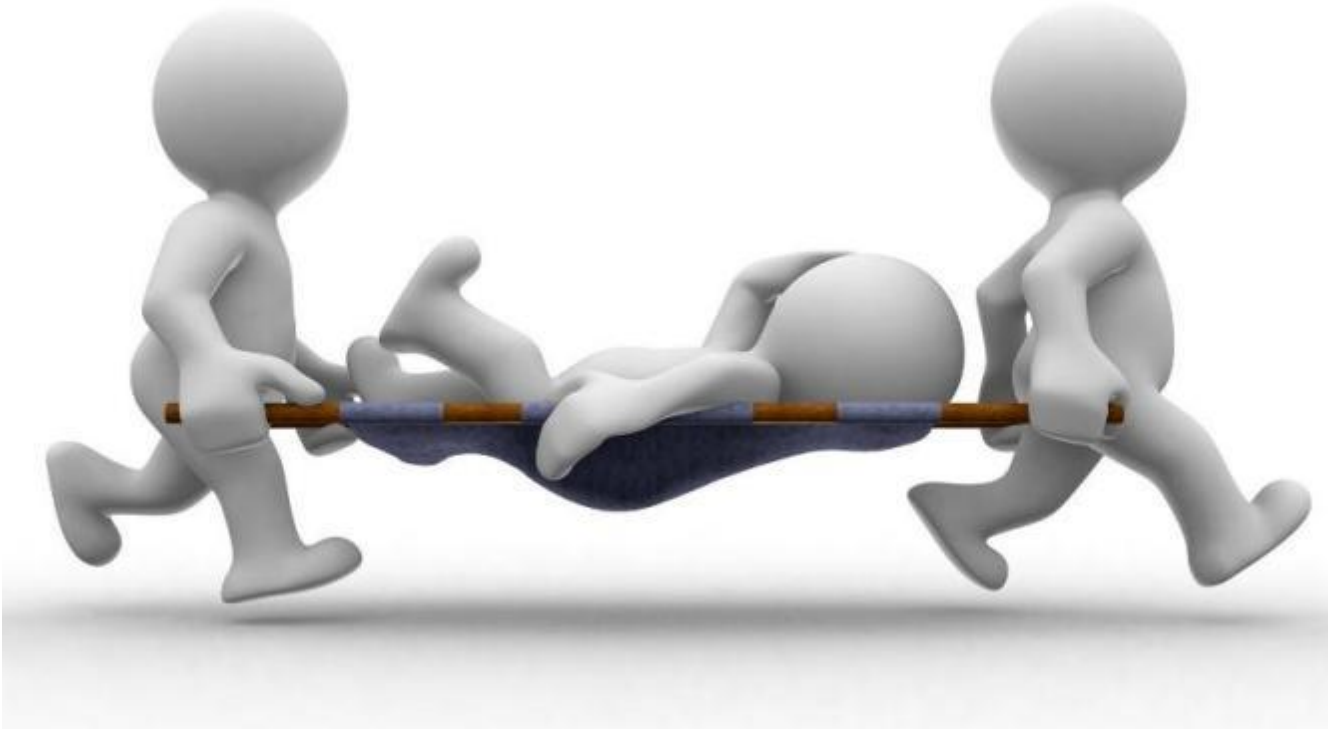
Morbidite hızı 4. dekatta en yüksek



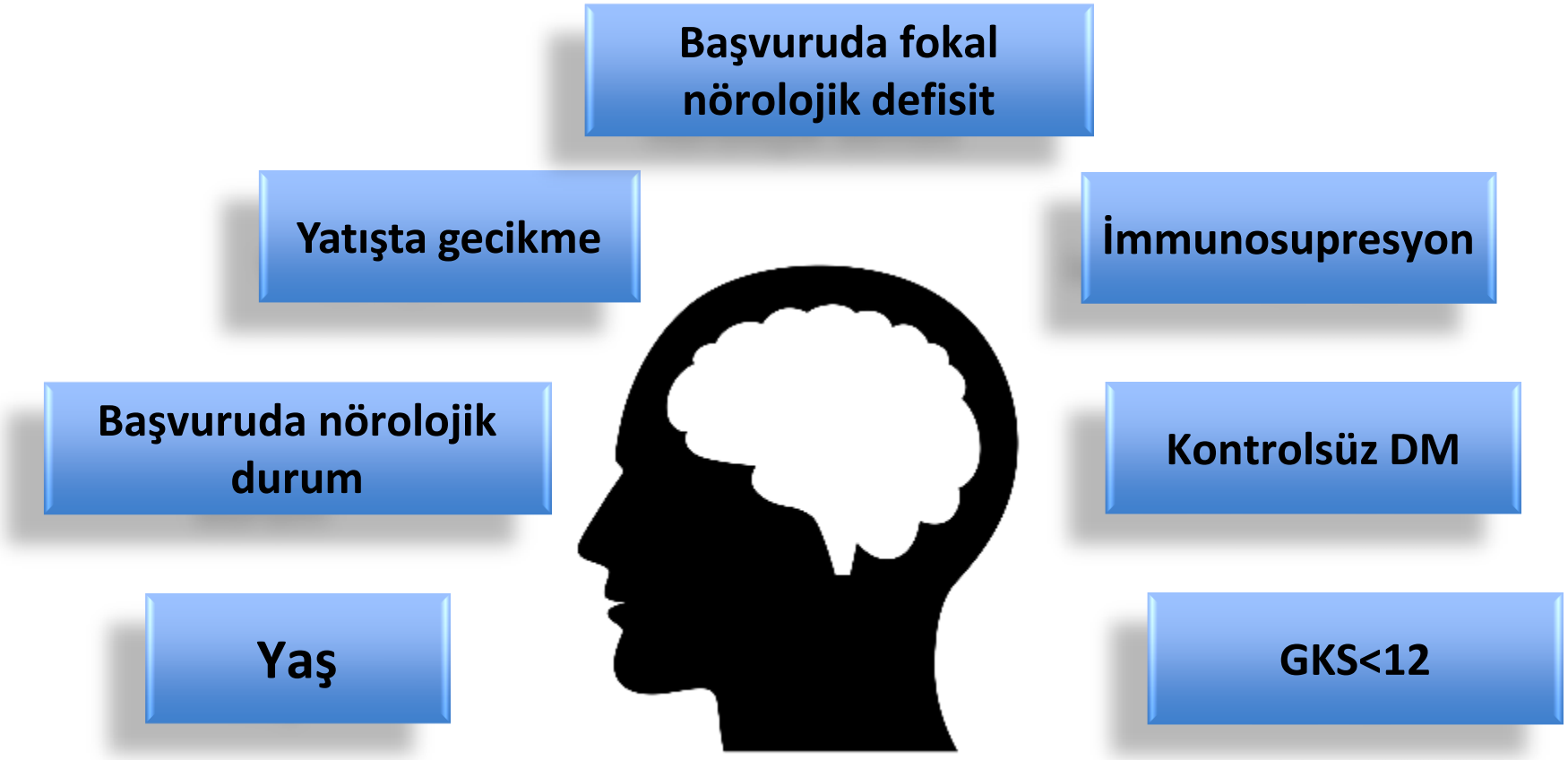
**Epileptik nöbetler**

**Mental durumda kalıcı değişim**

**Fokal motor defisitler**



# Mortalite ve Kalıcı Nörolojik Defisit

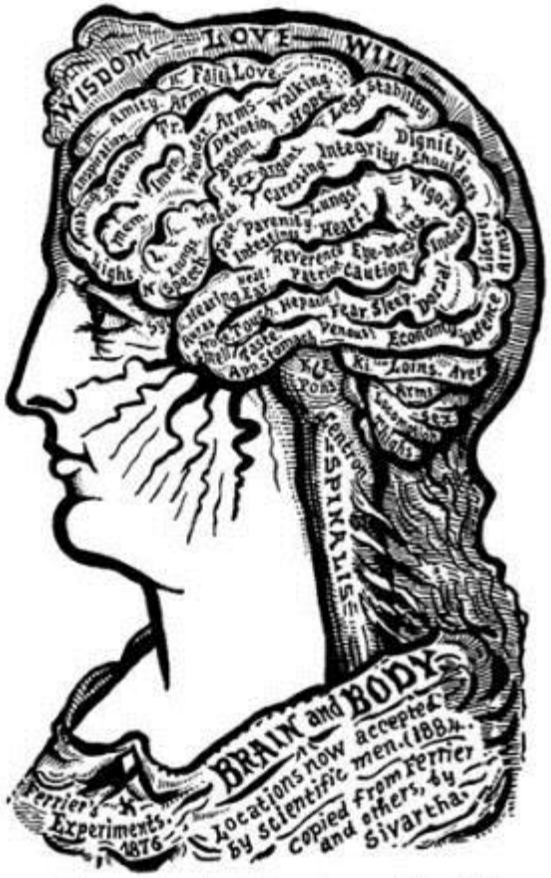



Menon S et al. Current epidemiology of intracranial abscesses: A prospective 5 year study. J Med Microbiol 2008;57:1259-68.

| Kaynak | Sıklık | Olası Odak | |
|---|---|---|---|
| Perikranyal enfeksiyöz odak | %25-50 | Paranazal sinüsler, orta kulak, dental enfeksiyon | Dental enfeksiyonlar, etmoid veya frontal sinüzit;genellikle frontal lob |
| | | | Subakut, kronik OM, mastoidit; inferior temporal lob ve serebellum |
| Hematojen yayılım | %15-30 | Akc. Apsesi, ampiyem, bakteriyel endokardit, cilt enfeksiyonları | Genellikle multipl Orta serebral arterin dağılımına uygun tutulum |
| Direkt inokulasyon | %8-19 | | Çoğunlukla travmatik beyin hasarı, nöroşirurjik cerrahi girişim sonrası |

# Patogenez

- %40'ında kaynak belirsiz
- Beyin parankim invazyonu
  - Direkt yayılım
  - Hematojen yayılım
- Direkt yayılım →%20-60'ı
- Bakteremi → Multipl lezyon



INFECTIOUS DISEASES, 2015
http://dx.doi.org/10.3109/23744235.2015.1113557

Taylor & Francis
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ORIGINAL ARTICLE

# Intracranial abscesses over the last four decades; changes in aetiology, diagnostics, treatment and outcome

Anu Laulajainen-Hongisto[a,b], Laura Lempinen[a], Esa Färkkilä[c], Riste Saat[d], Antti Markkola[d], Kimmo Leskinen[a,e], Göran Blomstedt[f], Antti A. Aarnisalo[a], and Jussi Jero[a]

[a]Department of Otorhinolaryngology; [b]Department of Allergy; [c]Department of Oral and Maxillofacial Diseases, HUS Medical Imaging Centre, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [d]Department of Radiology; [e]Pikkujätti Medical Centre for Children and Youth, Helsinki, Finland; [f]Department of Neurosurgery, University of Helsinki and Helsinki University Hospital, Töölö Hospital, Helsinki, Finland

Table I. The number of intracranial abscesses in children and adults, the most important pre-disposing conditions and number of surgical procedures over time.

| | All ($n = 166$) | Adults ($n = 141$) | Children ($n = 25$) | 1970–1979 ($n = 40$) | 1980–1989 ($n = 34$) | 1990–1999 ($n = 27$) | 2000–2012 ($n = 65$) |
|---|---|---|---|---|---|---|---|
| Children | 25 (15%) | — | 25 (100%) | 12 (30%) | 6 (18%) | 3 (11%) | 4 (6%) |
| Adults | 141 (85%) | 141 (100%) | — | 28 (70%) | 28 (82%) | 24 (89%) | 61 (94%) |
| Ear-nose-throat infection | 37 (22%) | 27 (19%) | 10 (40%) | 17 (43%) | 4 (12%) | 6 (22%) | 10 (15%) |
| Otitis | 18 (11%) | 16 (11%) | 2 (8%) | 10 (25%) | 0 | 5 (19%) | 3 (5%) |
| Sinusitis | 15 (9%) | 8 (6%) | 7 (28%)[a] | 5 (13%) | 3 (9%) | 1 (4%) | 6 (9%) |
| Dental infection | 24 (15%) | 23 (16%) | 1 (4%) | 3 (8%) | 0 | 0 | 21 (32%) |
| Cardiac anomaly | 21 (13%) | 11 (8%) | 10 (40%)[b] | 7 (18%) | 8 (24%) | 3 (11%) | 3 (5%) |
| Pulmonary infection | 14 (8%) | 13 (9%) | 1 (4%) | 2 (5%) | 6 (18%) | 0 | 6 (9%) |
| Punction | 117 (71%) | 93 (66%) | 24 (96%)[c] | 36 (90%) | 32 (94%) | 21 (78%) | 28 (43%) |
| Craniotomy | 54 (33%) | 53 (38%) | 1 (4%)[d] | 7 (18%) | 2 (6%) | 7 (26%) | 38 (58%) |
| Ventriculostomy | 7 (4%) | 7 (5%) | 0 | 0 | 2 (6%) | 2 (7%) | 3 (5%) |

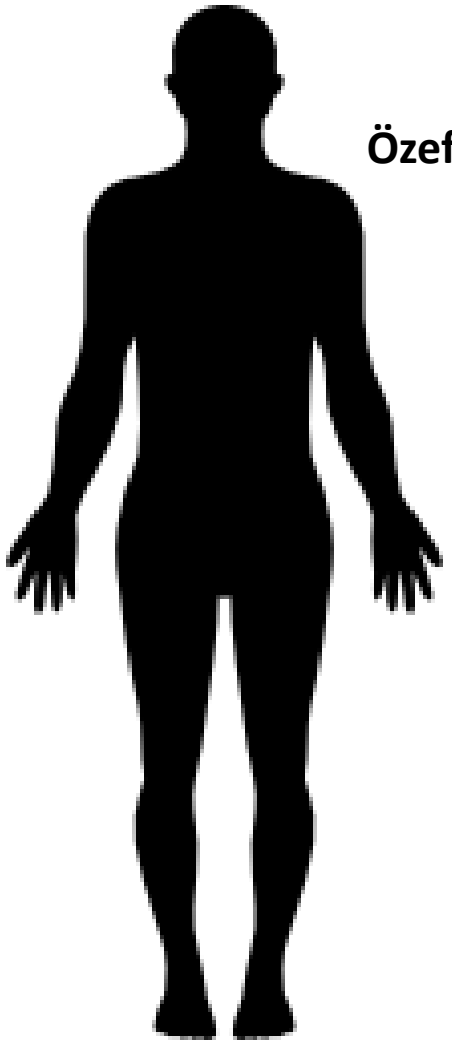
# Hematojen Yol

Kronik pulmoner enf.
Akc. apsesi, ampiyem
Bronşiektazi veya kistik fibroz

İntraabdominal enfeksiyonlar

Pelvik enfeksiyonlar

Sağdan sola şantlı pulmoner A-V malformasyonlar



Özefagus dilatasyonu ve skleroterapi

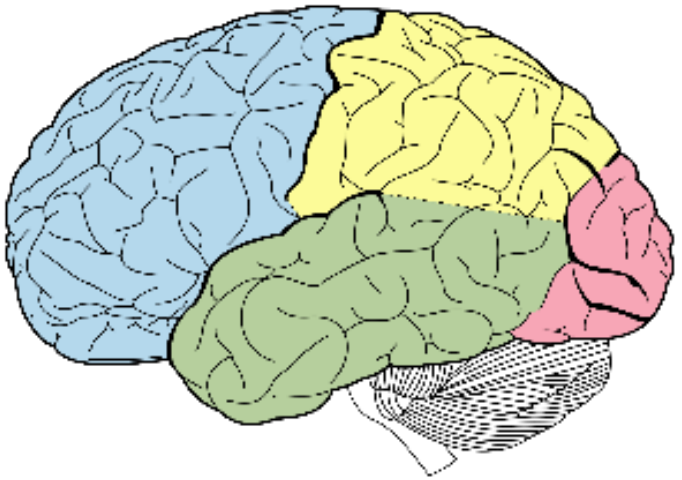
Bakteriyel endokardit

Siyanotik konjenital kalp hast.

Cilt enfeksiyonları

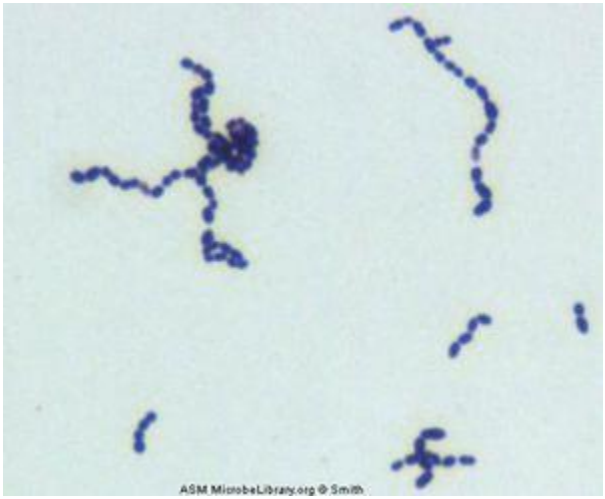
# Yerleşim

- Frontal veya temporal lob
- Fronto-paryetal
- Paryetal
- Serebellar
- Oksipital

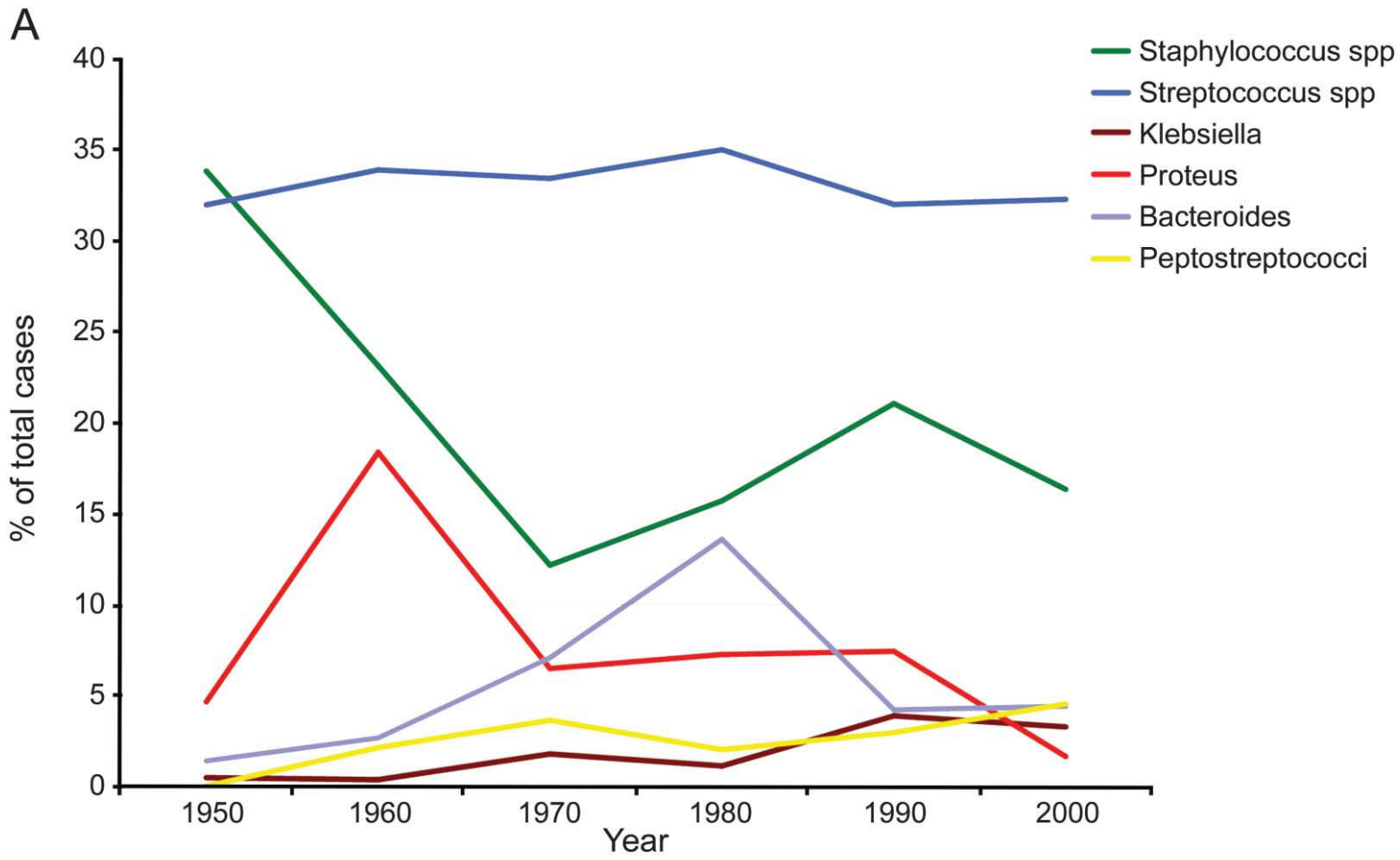


# Mikrobiyoloji

- Etyoloji değişken
- Gelişme şekli
- Konağın immunitesi önemli
- Streptokoklar en sık karşılaşılan etken
  - Olguların %70'inden sorumlu*



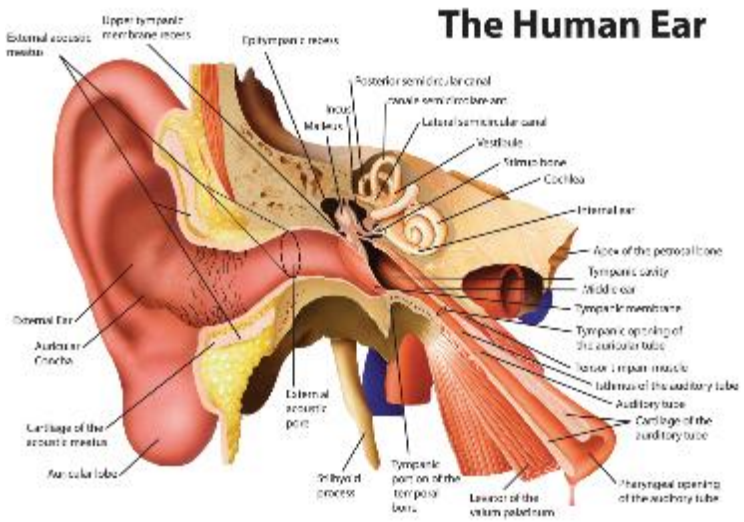

* Derber CJ, Troy SB. Head and Neck emergencies: Bacterial Meningitis, encephalitis, brain abscess, upper airway obstruction, and jugular septic thrombophlebitis. Med Clin North Am 2012;96:1107-26.




Brouwer et al. Clinical characteristics and outcome of brain abscess:Systematic review and meta-analysis. Neurology. 2014

# Oral Kavite , Otorinolaringeal, Hematojen Kaynak

- Anareoblar
- Streptokoklar, *Bacteroides spp.*, *Prevotella melaninogenica*, *Propionibacterium*, *Fusobacterium* Aktinomiçesler
- *Morganella morganii*

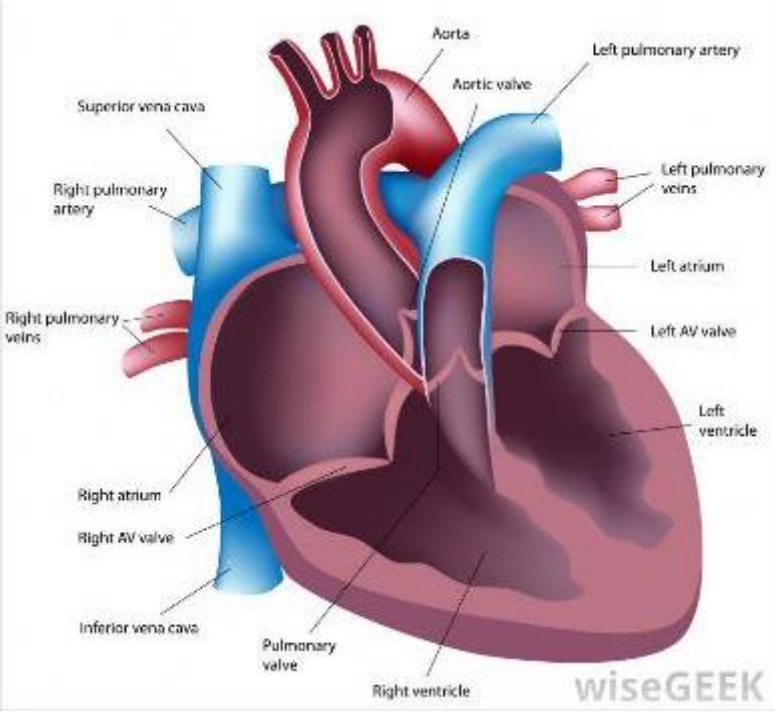


# Travma, Nöroşirurjik Cerrahi

- Aerobik gram pozitifler
  - *Streptococcus viridans*
  - *Streptococcus  milleri*
  - *S. aureus*
- Gram negatif basiller
  - *Klebsiella*
  - *Pseudomonas*
  - *Escherichia coli*
  - *Proteus*

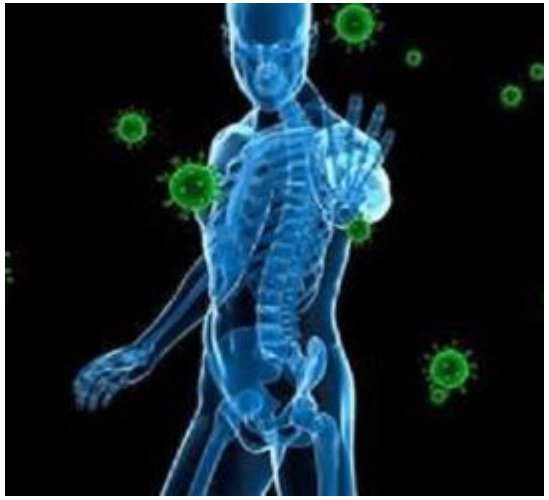
# Kardiyak, A-V Şant

- *Peptostreptococcus*
- Streptococcus türleri
  - *S. viridians*
  - *Mikroaerofilikler*



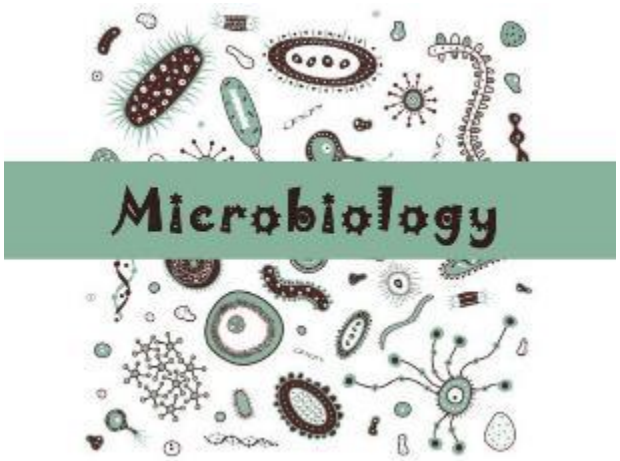
# Özel Hasta Grupları

- Glikokortikoid, immunosupresif kullanımı
- Alkol kullanımı
- Nörolojik hastalıklar
  - Alzheimer
  - Parkinson
- HIV/AIDS



# Özel Hasta Grupları

- *Pseudomonas*
- Toxoplasma
- Listeria
- *Nocardia*
- *Aspergillus*
- *Cryptococcus*
- *Coccidioides* ve diğer fungal patojenler



# Göçmenler, Gelişmekte Olan Ülkelere Seyahat

- *Cysticercosis*
- *Entamoeba histolytica*
- *Schistosoma*
- *Paragonimus*

# Semptom ve Bulgular

- En sık semptom baş ağrısı
- Ateş, bilinç değişimi
- Nörolojik bulgular lokalizasyonla ilişkili
- Günler-haftalar içerisinde
- Epileptik nöbetler

# Semptom ve Bulgular

- Frontal -sağ temporal lob
  - Davranış değişiklikleri
- Beyin kökü- Serebellum
  - Kafa çifti tutulumu
- Hidrosefali
  - Baş ağrısı, bilinç değişimi, yürüme bozuklukları
- Siyanotik Kalp Hastalığı + Baş Ağrısı !!!

- Ense sertliği
  - Oksipital lob !!
  - Lateral ventriküle açılım
- Bilinç değişimi
  - Ciddi serebral ödem
  - Kötü prognoz göstergesi
- Kusma
  - Artmış  İK basınç

Chirurgia (2013) 108: 215-225
No. 2, March - April


# Brain Abscesses: Clinical Experience and Outcome of 52 Consecutive Cases

**M. Radoi[1,3], V. Ciubotaru[2], L. Tataranu[1,2]**

[1]"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania
[2]Neurosurgery Department, "Bagdasar-Arseni" Emergency Clinical Hospital, Bucharest, Romania
[3]Neurosurgery Department, "V. Voiculescu" Institute of Cerebrovascular Diseases, Bucharest, Romania

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*Table 1. Symptoms and signs*

| Symptoms and signs | No. of patients | % |
|---|---|---|
| Headache | 42 | 80.76% |
| Nausea and vomiting | 18 | 34.61% |
| Papilloedema | 10 | 19.23% |
| Altered state of consciousness | 6 | 11.53% |
| Focal neurological deficits | 22 | 42.30% |
| Seizures | 8 | 15.38% |
| Fever | 27 | 51.92% |
| Signs of meningeal irritation | 7 | 13.46% |

# Klinik İpuçları

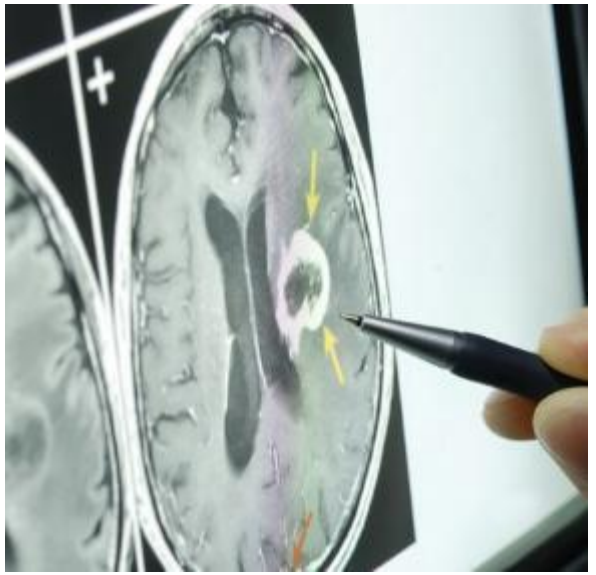
- Altta yatan nörolojik hastalık !!
- Hematojen yayılım
  - Primer hastalığın bulguları

# Ayırıcı Tanı

- Nörolojik, enfeksiyöz hastalıklar
- Beyin tm
- İnme
- Bakteriyel menenjit
- Epidural apse, subdural ampiyem
- HIV (+)’ lerde primer MSS lenfoması?

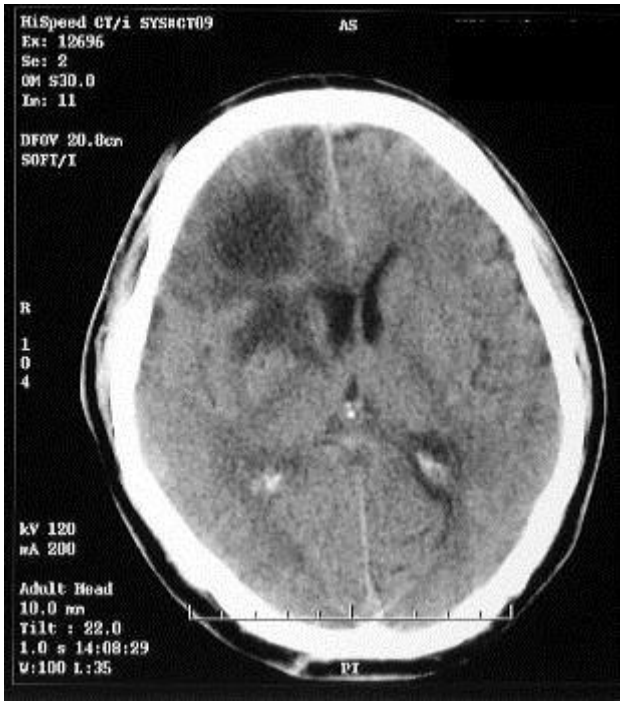
# Tanı

- Görüntüleme yöntemleri
- Kontrastlı beyin BT
  - Lezyonun boyutları, sayısı, yerleşimi
- Difüzyon ağırlıklı MR
  - BA'nın primer-kistik, nekrotik tm.den ayrımı



# Bilgisayarlı Tomografi

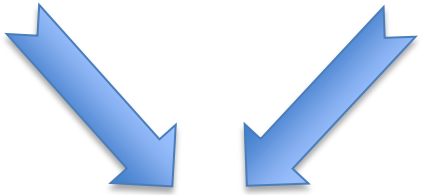
- MR kadar sensitif değil
- Erişimi daha kolay
- Mutlaka kontrastlı çekilmeli
- Lezyonun yaşına göre farklı görünümler



# BT

Erken tanı
Kesin lokalizasyon
Lezyonların sayısı
büyüklüğü
Karakteristiği

Hidrosefali
İK basınç artışı
Ödem
Subdural ampiyem
Ventrikülit ?



**Tedavinin planlanması**
**Etkinliğinin değerlendirilmesi**
**Takip**

# Manyetik Rezonans

- Erken serebrit, satellit lezyonlarda daha duyarlı
- Santral nekroz, halka oluşumu ve serebral ödem!
- Beyin sapını daha iyi gösterir

# Lomber Ponksiyon

- LP’nin önerilmediği veya kontrendike olduğu tek MSS enfeksiyonu
- Fokal semptom ve bulguları olanlarda kontrendike
- Herniasyon  riski!!
- Ventrikül içi rüptür olan olgularda menenjit benzeri BOS bulguları

# Brain Abscess: Management and Outcome Analysis of a Computed Tomography Era Experience with 973 Patients

*Narendra Nathoo[1,3], Sameer S. Nadvi[1,2], Pradeep K. Narotam[1,4], James R. van Dellen[1,5]*

**Key words**
- Brain abscess
- Cranial infections
- Health care
- Otogenic
- Paranasal
- Sinusitis
- Trauma

**Abbreviations and Acronyms**
BA: Brain abscess
CD: Cluster of differentiation
CI: Confidence interval

OBJECTIVE: Brain abscess (BA) is a neurosurgical emergency and despite significant medical advances, it remains a surgical challenge. A single institution's two decade computed tomography era management experience with BA is reported.

METHODS: A retrospective analysis of patients with BA, admitted to the Department of Neurosurgery, Wentworth Hospital, Durban, KwaZulu-Natal, South Africa, was performed. The medical records were analyzed for demographic, clinical, neuroimaging, neurosurgical and otolaryngology management, microbiological characteristics, and their relationship to outcome.

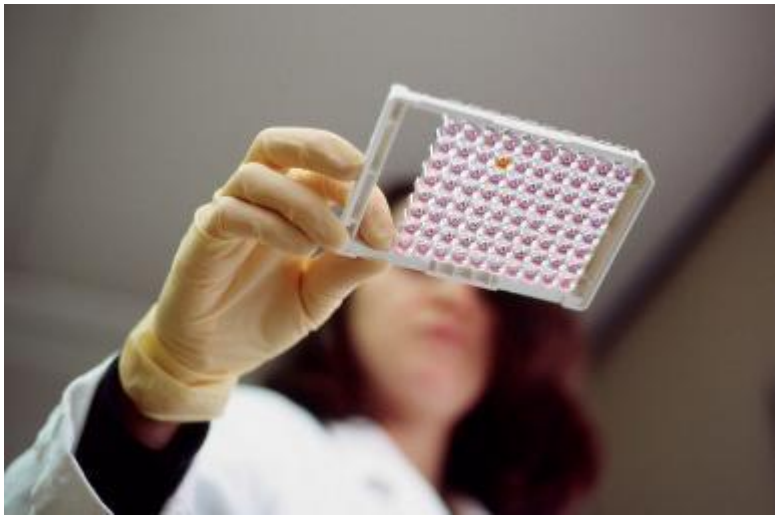
**Hastaların 193'üne LP**
**26'sında genel durumda bozulma**
**7 hasta hayatını kaybetmiş**
**Olguların %41.5'inde üreme yok**
**31 hastada normal BOS bulguları**

# Kültür

- BT eşliğinde aspirasyon veya cerrahi sonrası materyal
- Gram boyama
- Aerobik, anaerobik, mikobakteri, fungal kültür
- Özel boyamalar
  - ARB, modifiye ARB, fungal boyamalar

# Seroloji

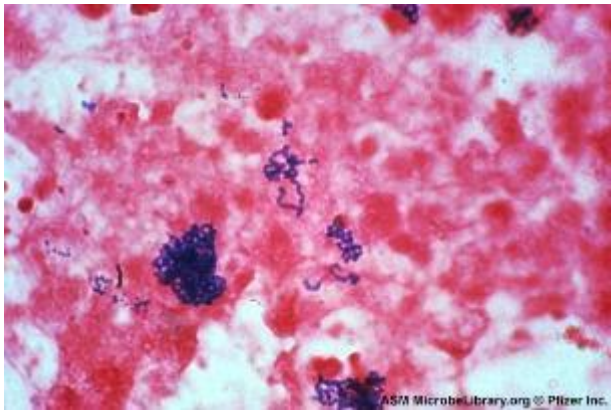
- Parazitik apse riski yüksek olan hastalarda
- Kan ve/veya BOS örnekleri
- Anti-Toksoplasma Ab
- Anticysticercal Ab



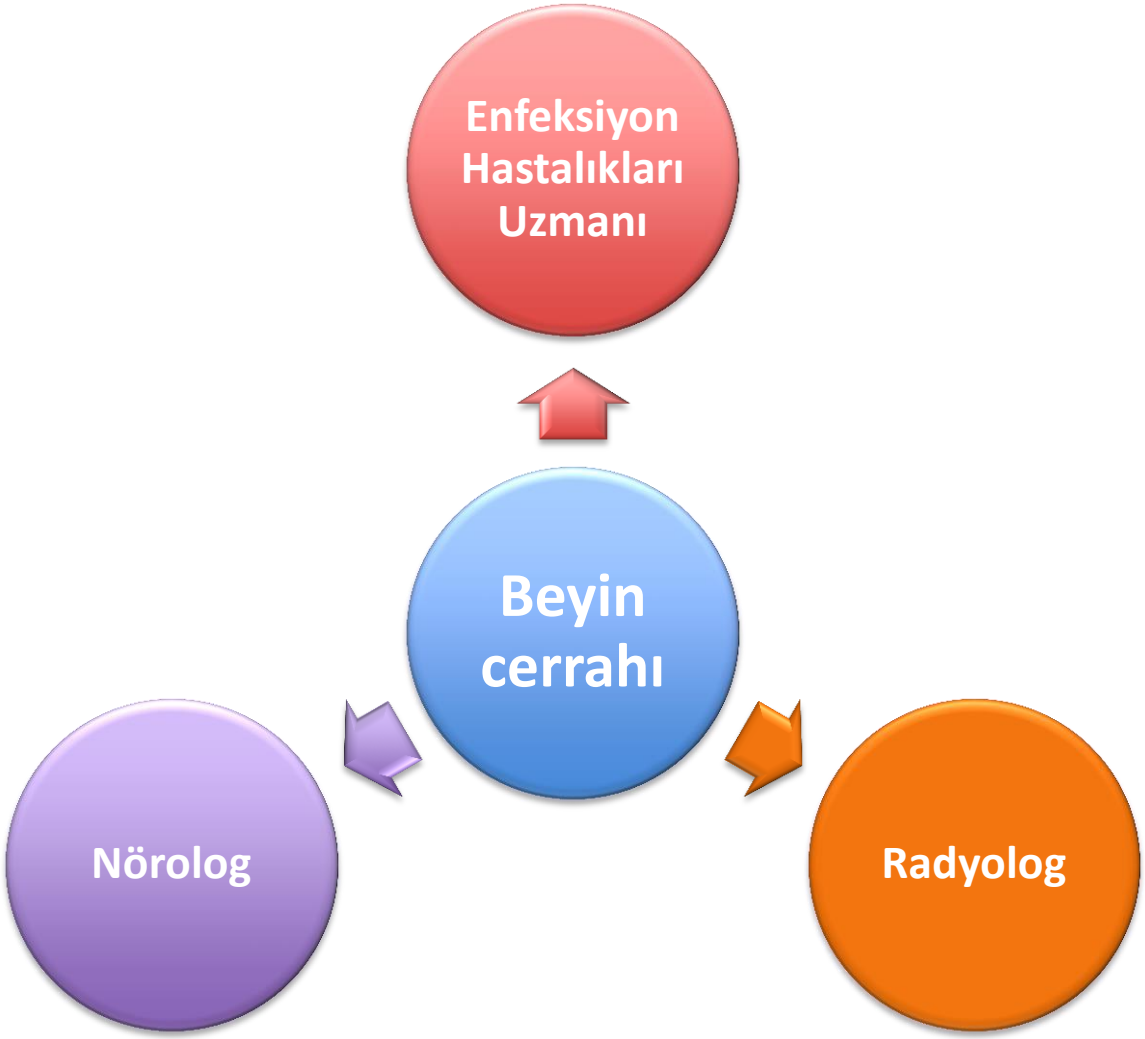
# Histopatoloji

Tanının kesinleştirilmesi

Etyolojik ajanın tanımlanması



# Tedavi


Enfeksiyon Hastalıkları Uzmanı
Beyin cerrahı
Nörolog
Radyolog

Cerrahi Müdahale

Nöroradyolojik değerlendirme

Antimikrobiyal tedavi, odak eradikasyonu

Sıklıkla uygun antimikrobiyal tedaviye ek olarak drenaj gerektirir

Erken dönemde nöroşirurji konsültasyonu önerilir

Mathisen GE, Johnson JP. Brain abscess. Clin Infect Dis 1997;25:763-79

# Medikal Tedavi

**Tek apse***
<2.5 cm
GKS > 12
Etyoloji iyi tanımlanmış

**Multipl apse‡**
Cerrahi sonrası >2.5 cm
Kitle etkisi gösteren apseler
Opere edilmesi riskli hastalar

* Grade C, ‡ Grade D

Arlotti M et al. Consensus document on controversial issues for the treatment of infections of the central nervous system: Bacterial brain abscesses. Int J Infect Dis 2010;14(Suppl 4):S79-92.

# Hangi Antibiyotik?

Geniş spektrumlu

KBB'yi geçebilen

Anaerobik etkin

# Ampirik Tedavi

Olası enfeksiyon kaynağı

Gram boyama sonuçları

*Örnekler antibiyotik öncesi veya ilk 3 gün içinde alınmalı

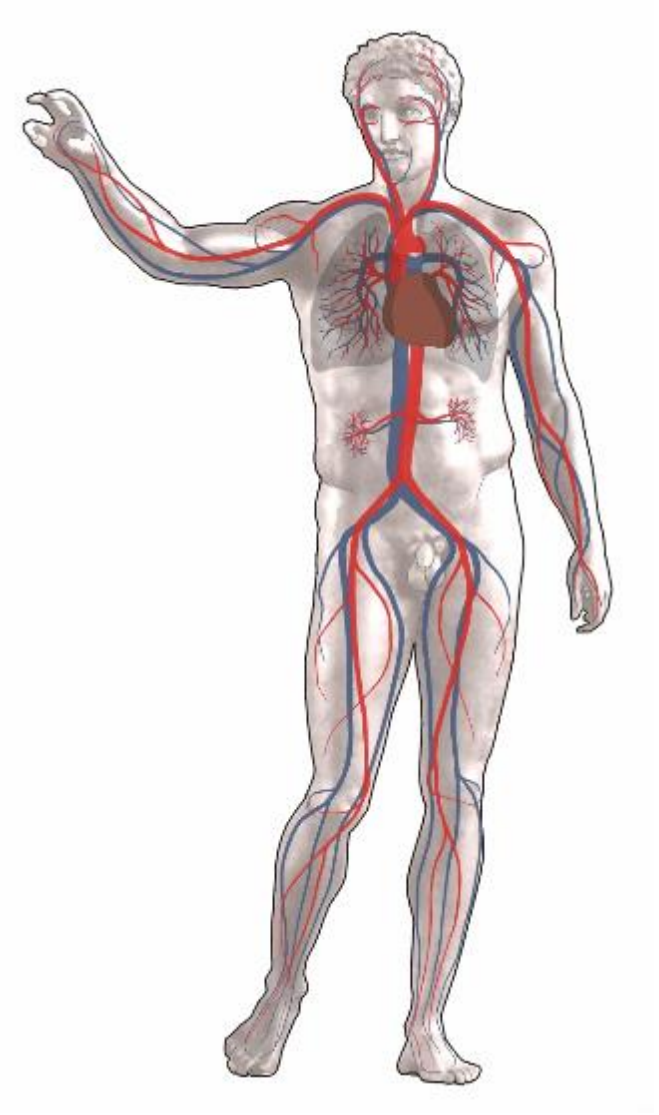
*Arlotti M et al. Consensus document on controversial issues for the treatment of infections of the central nervous system: Bacterial brain abscesses. Int J Infect Dis 2010;14(Suppl 4):S79-92.

# Oral, Otojenik, Sinüs

- Oral kaynak
  - Penisilin G + Metronidazol
- Sinüs, kulak kökenli
  - 3.KS + Metronidazol

# Hematojen Yol

- Bakteremi, endokardit
- Orta serebral arter alanında multipl apseler
- MRSA etkin tedavi
  - Vankomisin
- MSSA ürerse
  - Nafsilin, Oksasilin
- Etken ???
  - 3.KS + Metronidazol eklenebilir



# Postoperatif Nöroşirurji

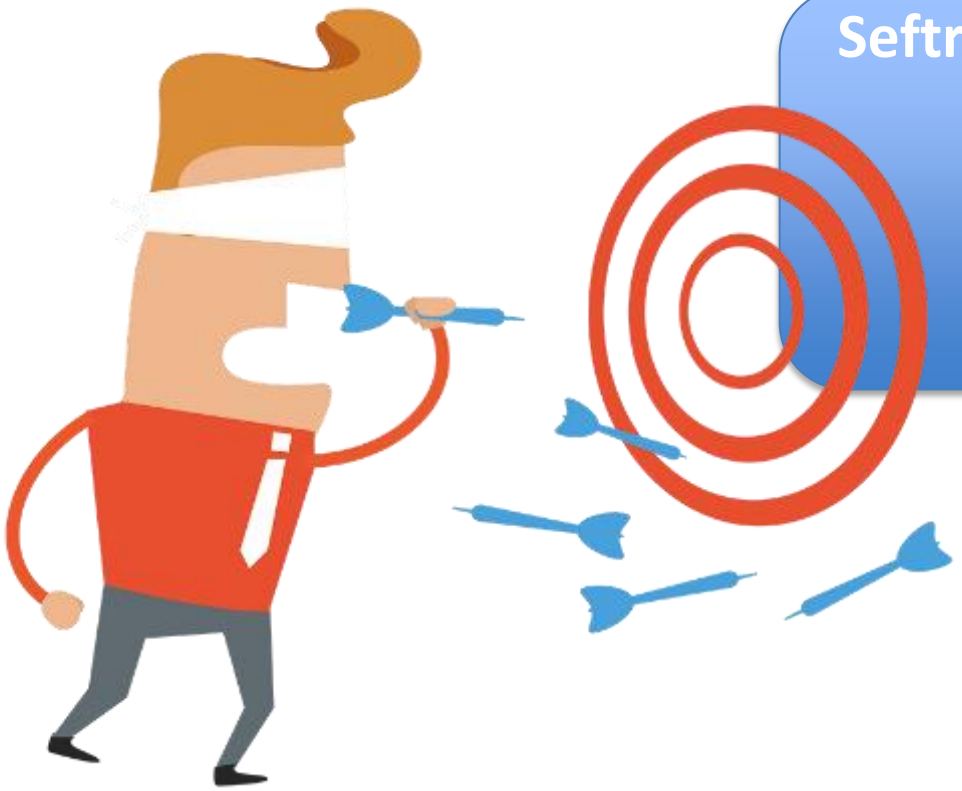
**Seftazidim / Sefepim / Meropenem + Vankomisin**

# Penetran Travma

Seftriakson / Sefotaksim + Vankomisin

Paranazal sinüs tutulumu → Metronidazol

# Kaynak Bilinmiyor



Seftriakson / Sefotaksim
+
Vankomisin
+
Metronidazol

# Etkene Yönelik Tedavi

Tedavi rejiminin basitleştirilmesi

Hedefe yönelik tedavi

# Tedavi Süresi

- Apsenin boyutları
- Cerrahi tedavi öyküsü
- Etken mikroorganizma
- Tedavi yanıtı

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# Consensus document on controversial issues for the treatment of infections of the central nervous system: bacterial brain abscesses

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**Cerrahi uygulanan hastalarda 4-6 hafta**
**Sadece tıbbi tedavi uygulananlar veya multipl olup büyük olanlarının cerrahi olarak tedavi edildiği hastalarda 6-8 hafta**

Brain antibiotic diffusion
Surgical approach
Conservative medical approach

antibiotics. The successful treatment of brain abscesses requires surgery, appropriate antibiotic therapy, and eradication of the primary source; nevertheless many controversial issues on the management of

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Review

# Brain abscess: An overview

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ABSTRACT

Intracranial abscess is a formidable entity. Despite the advent of newer antibiotics and surgical strategies, the overall outcome and quality of life issues in brain abscess patients still remain a continuous challenge for the neurosurgical community. It is a direct interplay between the virulence of the offending microorganism and the immune response of the host. An analysis of our experience in the 289 cases of surgically treated pyogenic brain abscess is presented along with an *overview of intra-cranial abscess of varied etiology and in different locations*. The etiology, pathogenesis, radiological advances and treatment modalities of brain abscess are discussed in light of current literature.



**İmmunsupreselerde tedavi 3-12 aya kadar uzatılabilir**

# Cerrahi Tedavi

- Acil drenaj
  - Tanı, tedavi
  - Subdural ampiyem, serebellar apse !!
- Aspirasyon olguların çoğunda başarılı
- Cerrahi müdahale
  - Yoğun kıvamlı apseler
  - Multiloküler apseler

# Cerrahi Tedavi

- Tıbbi tedaviye yanıtsızlık
  - Boyut artışı
  - 2-3 haftalık tedaviye rağmen gerileme olmaması
- Travmatik apseler
  - Yabancı cisimlerin ve kemik fragmanlarının çıkarılması
- Serebellar, beyin sapı
  - Herniasyon !!
- Periventriküler apseler
  - İntraventriküler rüptür !!

# Prognoz

Kötü prognostik faktörler

- Tanıda gecikme, hızla ilerleyen olgular, koma, multipl apseler, intraventriküler rüptür, fungal etyoloji [1,2]

.

Yeni doğan ve ileri yaşlarda prognoz kötü
Fokal nörolojik defisitler, mental retardasyon

1.Ananth Ramakrishnan K et al. Bacterial meningitis and brain abscess. Medicine 2009; 37 :567-73.
2.Sharma R. Fungal infections of the nervous system: Current perspective and controversies in management. Int J Surg 2010;8:591-601

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Clinical Article

# Risk Factors Associated with Poor Outcomes in Patients with Brain Abscesses

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**Objective :** The purpose of this study was to describe the clinical characteristics, treatment outcomes, and prognostic factors in patients with brain abscesses treated in a single institute during a recent 10-year period.

**Methods :** Fifty [redacted] underwent navigation-assisted abscess aspiration with antibiotic treatment were included in this study. Varia[redacted]patients' medical records and radiological data. A comparison was made between patients with favorable [redacted] unfavorable (GOS <4) outcomes at discharge. Additionally, we investigated the factors influencing the duration of antibiotic administration.

GKS<13, başvuruda bilinç düzeyi

**Results :** The study included 41 male and 10 female patients with a mean age of 53 years. At admission, 42 patients (82%) showed either clear or mildly disturbed consciousness (GCS ≥13) and 24 patients (47%) had predisposing factors. The offending microorganisms were identified in 25 patients (49%), and *Streptococcus* species were the most commonly isolated bacteria (27%). The mean duration of antibiotic administration was 42 days. At discharge, 41 patients had a favorable outcome and 10 had an unfavorable outcome including 8 deaths. The decreased level of consciousness (GCS <13) on admission was likely associated with an unfavorable outcome ($p$=0.052), and initial hyperglycemia (≥140 mg/dL) was an independent risk factor for prolonged antibiotic therapy ($p$=0.032).

**Conclusion :** We found that the level of consciousness at admission was associated with treatment outcomes in patients with brain abscesses. Furthermore, initial hyperglycemia was closely related to the long-term use of antibiotic agents.

**Key Words :** Brain abscess · Glasgow Coma Scale · Glasgow Outcome Scale · Hyperglycemia.

# Brain abscess: analysis of results in a series of 51 patients with a combined surgical and medical approach during an 11-year period

**Halit Çavuşoglu, M.D., Ramazan Alper Kaya, M.D., Osman Nuri Türkmenoglu, M.D., Ibrahim Çolak, M.D., and Yunus Aydin, M.D., P.hd.**

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*Object.* In this study the authors' goal was to present the clinical and imaging results of the combined surgical and medical treatment of intracranial abscesses.

*Methods.* The authors retrospectively analyzed the data in 51 patients with intracranial abscesses who underwent surgery between January 1997 and November 2007. Patients were treated with aspiration through a single bur hole, total resection with open craniotomy, or image-guided stereotactic aspiration. Computed tomography or magnetic resonance imaging was performed ~ 24 hours after surgery to evaluate the size of the abscess and almost weekly during follow-up until the abscess and/or cerebral edema was reduced. Clinical results were analyzed using modified Rankin Scale (mRS) scores.

*Results.* There were 36 male and 15 female patients, and their ages ranged from 14 months to 58 years (mean 29 years). Adjacent localized cranial infection was the most common predisposing factor in 31 patients (61%). Thirty-two patients were treated by repeated aspiration via a single bur hole. *Streptococcus* and *Staphylococcus* species were isolated most frequently. No statistically significiant difference between causative organisms and clinical outcome was identified ($p > 0.05$). Assessment of overall 1-year clinical outcomes was favorable (mRS Scores 0–2) in 76.5% of patients (39 of 51 patients). The initial neurological condition was strongly correlated with the clinical outcome ($p < 0.001$).

*Conclusions.* A combination of surgical aspiration or removal of all abscesses > 2.5 cm in diameter, a 6-week or longer course of intravenous antibiotics, and weekly neuroimaging should yield cure rates of > 90% in patients with intracranial abscesses. *(DOI: 10.3171/FOC/2008/24/6/E9)*

**Key Words** • **brain abscess** • **bur hole aspiration** • **craniotomy** • **excision** • **stereotactic aspiration**

# Sonuç Olarak

Tanı, tedavi seçeneklerindeki ilerlemelere rağmen hala önemli bir sorun

Yaşlı, immunsupresif popülasyonun artışı

Komplikasyonların önlenmesi?

Yeni tanı yöntemleri???

**Teşekkürler…**