Candida parapsilosis

Dr. Seniha ŞENBAYRAK

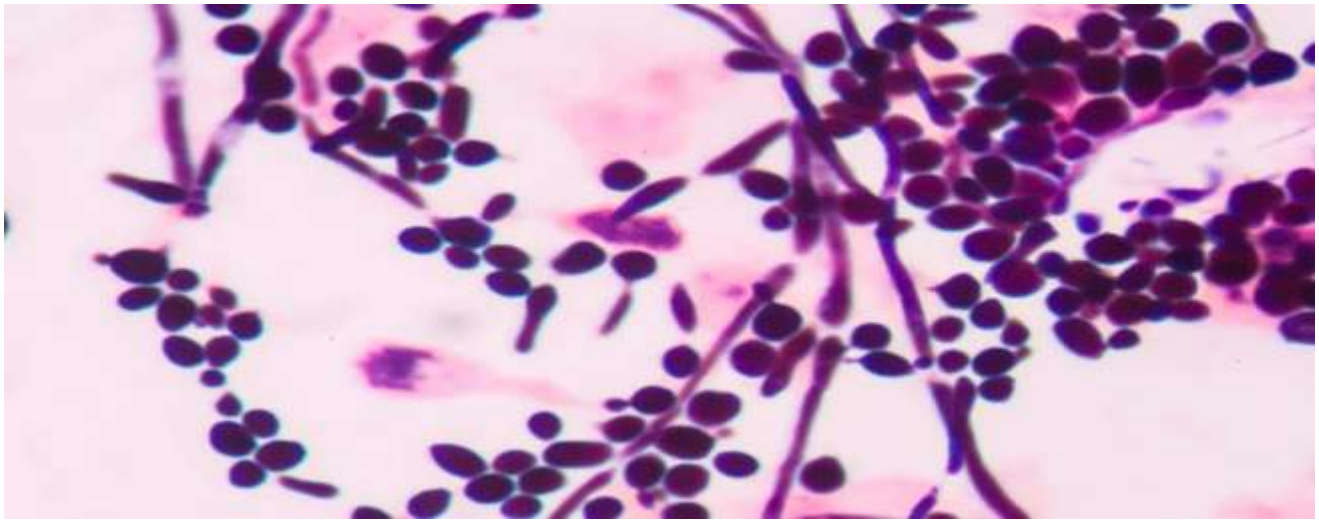
Sağlık Bilimleri Üniversitesi

Haydarpaşa Numune Eğitim ve Araştırma Hastanesi

Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Kliniği

Candida türleri,

- İnvaziv mantar infeksiyonları arasında birinci sırada
- Sağlık bakımı ilişkili infeksiyonların %10-15'i
- *Candida albicans*, en fazla izole edilen tür



Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)

Candida parapsilosis

- Patojen olmayan bir tür olarak kabul edilmişken
- 1940 yılında, IV ilaç bağımlısında gelişen endokardit vakasında etken olarak izole edilmiş

- Son 10-15 yılda insidansi büyük ölçüde artmıştır
- Tek ve çok merkezli birçok kandidemi çalışmasında, *C. parapsilosis'in* ikinci ya da üçüncü sırada olduğu bildirilmiş

S. Silva et al, FEMS Microbiol Rev 36 (2012) 288–305
Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)

TABLE 1 Update on candidemia episodes caused by *C. parapsilosis*[a]

Region	% *C. parapsilosis* incidence (ranking)	% *C. albicans* incidence (ranking)	Yr(s)	No. of hospitals included	Reference
Europe					
Southern region					
Spain	24.9 (2nd)	45.3 (1st)	2010–2011	29 hospitals, nationwide	30
Italy	22 (4th)	73.4 (1st)	Undefined	3 hospitals in southern Italy	31
	14.8 (3rd, Lombardy)	52.1 (1st, Lombardy)	2009	34 centers, nationwide	32
	23.5 (2nd, other areas)	45.2 (1st, other areas)			
	20 (2nd)	59 (1st)	2012–2013	39 hospitals, northern Italy	33
Portugal	23 (2nd)	40.4 (1st)	2011–2012	10 hospitals, nationwide	29
Greece	22.7 (2nd)	45.4 (1st)	2005–2009	PICU only, nationwide	28
Serbia	46	46	2014–2015	5 adult ICUs, nationwide	34
Middle/northern regions					
Finland	5 (3rd)	67	2004–2007	5 regions, nationwide	35
Austria	8.7 (3rd)	52.2 (1st)	2007–2008	9 centers	36
France	7.5 (3rd)	57 (1st)	2005–2006	180 ICUs, nationwide	37
United Kingdom	10.3 (3rd)	52 (1st)	2008	3 centers in Scotland, 2 centers in Wales	38
Switzerland	5.4 (4th)	61.9 (1st)	2004–2009	17 hospitals	39
Denmark	3.7 (3rd in females, 5th in males)	57.1 (1st)	2004–2009	6 hospitals	40
Norway	4.3 (4th)	67.7 (1st)	2004–2012	National surveillance study	41
Sweden	9 (3rd)	61 (1st)	2005–2006	Undefined, nationwide	42
Iceland	5 (5th)	56 (1st)	2000–2011	14 hospitals	43
America					
South America					
Continental study	26.5 (all episodes)	37.6 (all episodes)	2008–2010	21 hospitals from 7 countries	53
Argentina	23.9 (2nd)	42.5 (1st)			
Brazil	25.8 (2nd)	40.5 (1st)			
Chile	28.9 (2nd)	42.1 (1st)			
Colombia	38.5 (1st)	36.7 (2nd)	2008–2010	21 hospitals from 7 countries	53
Ecuador	30.4 (2nd)	52.2 (1st)			
Honduras	14.1 (4th)	27.4 (1st)			
Venezuela	39 (1st)	26.8 (2nd)			
Peru	25.3 (2nd)	27.8 (1st)	2013–2015	3 hospitals, Lima-Callao	50
	28.1 (1st)	39.9 (1st)	2009–2011	9 hospitals, Lima	49
Argentina	22 (2nd)	44 (1st)	2010–2012	5 institutions	51
Brazil	24.1 (2nd)	34.3 (1st)	2007–2010	16 hospitals, 5 regions, nationwide	52
North America					
Continental study	12.2 (3rd)	49.5 (1st)	2004–2008	23 centers in USA, 2 in Canada	24
USA	17 (3rd)	38 (1st)	2008–2011	17 hospitals (Baltimore, MD), 24 hospitals (Atlanta, GA)	47
	17.4 (2nd)	50.7 (1st)	1998–2006	52 hospitals, nationwide	48
Canada	21 (2nd)	59 (1st)	2003–2013	Nationwide NICU surveillance	54
Asia					
Continental study	12.1 (4th)	41.3 (1st)	2010–2011	25 hospitals across Asia	46
Japan	23.3 (2nd)	39.5 (1st)	2003–2014	10 university hospitals, nationwide	21
China	20.0 (2nd)	44.9 (1st)	2009–2014	65 general hospitals from 27 provinces	19
India	10.9 (3rd)	20.9 (2nd)	2011–2012	27 ICUs, nationwide	45
Oceania					
Australia	16.5 (3rd)	44.4 (1st)	2014–2015	Nationwide surveillance	44
Africa					
South Africa	35 (public hospitals) (2nd), >50 (private hospitals) (1st)	46 (1st)	2009–2010	Hospitals in 11 public sectors, >85 private sectors	12

Toth et al. Clin Microbiol Rev. 2019 Feb 27;32(2)

REVIEW ARTICLE

Candida glabrata, Candida parapsilosis and *Candida tropicalis*: biology, epidemiology, pathogenicity and antifungal resistance

Sónia Silva[1], Melyssa Negri[1], Mariana Henriques[1], Rosário Oliveira[1], David W. Williams[2] & Joana Azeredo[1]

[1]Institute for Biotechnology and Bioengineering, Universidade do Minho, Campus de Gualtar, Braga, Portugal; and [2]Tissue Engineering & Reparative Dentistry, School of Dentistry, Heath Park, Cardiff, UK

Table 2. Selected epidemiological studies published from 2000 to 2010, concerning the distribution of *Candida* species isolates among various types of candidosis

Candidosis	References	Period of observation	Region/ country	Number of strains	*C. albicans* (%)	*C. tropicalis* (%)	*C. parapsilosis* (%)	*C. glabrata* (%)
Oral candidosis	Gonzalez Gravina *et al.* (2007)	February–May 2003	Venezuela	43	42.3	12.8	14.9	2.1
	Martins *et al.* (2010a, b)	May 2005–2006	Portugal	53	79	4.8	6.5	4.8
	Luque *et al.* (2009)	-	Argentine	-	60.7	4.5	-	5.6
Candiduria	Kauffman *et al.* (2000)	-	USA	530	51.8	7.9	4.1	15.6
	Kobayashi *et al.* (2004)	-	Brazil	45	35.5	22.3	11.1	8.8
	Passos *et al.* (2005)	-	Brazil	43	70	4.6	4.6	7
	Binelli *et al.* (2006)	1999–2001	Brazil	23	52	43.5	-	17.3
	Chen *et al.* (2008)	June–August 2006	Australia	65	85.2	-	4.4	27.8
	Álvarez-Lerma *et al.* (2003)	1998–1999	Spain	389	68.4	36	0.5	8.2
	Dorko *et al.* (2002)	-	Slovakia	94	61.7	6.3	24.5	-
Candidemia	Hazen *et al.* (1986)	-	USA	126	21	38	12	3
	Chakrabarti *et al.* (2009)	-	India	-	26.3		-	10.5
	Colombo *et al.* (2007)	-	Brazil	282	38	48	23	9
	Costa-de-Oliveira *et al.* (2008)	During 2004	Portugal	-	35	-	26.5	-
	Bassetti *et al.* (2006)	1999–2003	Italy	182	40	9	23	15
	Miranda *et al.* (2009)	2004–2005	Brazil	-	42	33	16	2
	Tortorano *et al.* (2006)	1997–1999	Europe	473	53	7	14	14
	Trick *et al.* (2002)	During 1999	USA	-	59	10	11	12
	Pfaller *et al.* (2010)	2008–2009	Europe/ Asia/ American	1239	50	9.8	17.4	17.4

S. Silva et al, FEMS Microbiol Rev 36 (2012) 288–305

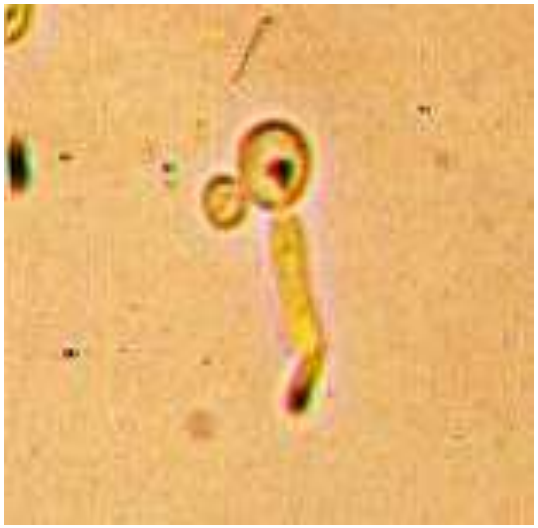
Candida parapsilosis

- Çevrede yaygın olarak bulunan önemli bir fırsatçı patojen; su, toprak ve bitkilerden sıklıkla izole edilir
- *C. parapsilosis* diğer *Candida* türlerinden farklı olarak, insan ve hayvanlarda mukozadan çok deride kolonize
- En sık olarak ellerden ve gastrointestinal sistemden izole edilir
- Ayrıca kan, tırnak, tıbbi plastik ve prostetik aygıtların yüzeylerinde de bulunur

Morfolojik Özellikleri

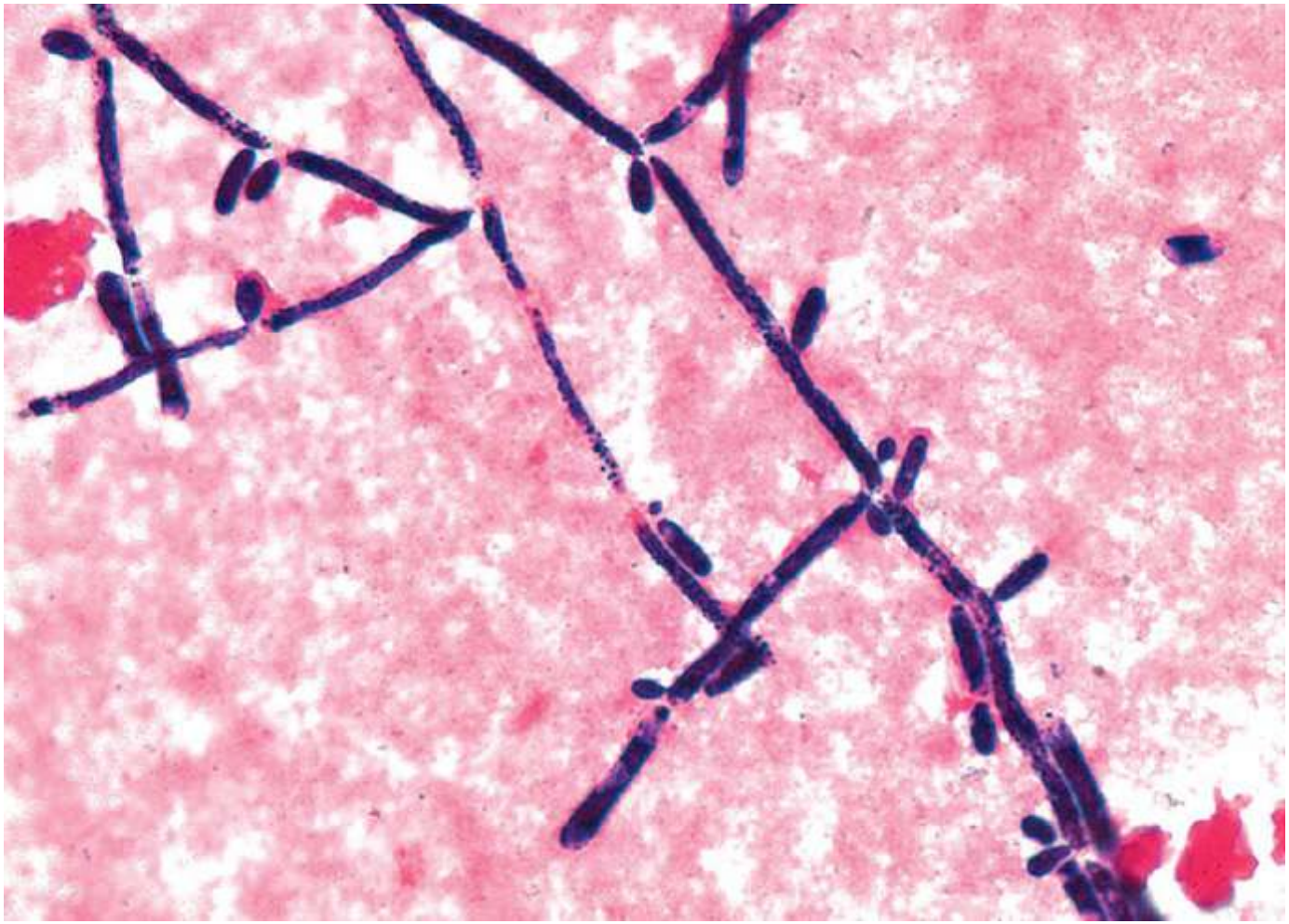
Table 1. Morphological characteristics of *Candida albicans*, *Candida tropicalis*, *Candida parapsilosis* and *Candida glabrata* species

Species	Germ tube production	Hyphae/pseudohyphae	Yeasts size (μm)	CHROM-agar colony colour
C. albicans	+	+/+	4–6 × 6–10	Blue-green
C. tropicalis	–	±/+	4–8 × 5–11	Dark blue
C. parapsilosis	–	–/+	2.5–4 × 2.5–9	White
C. glabrata	–	–/–	1–4	White, Pink-purple

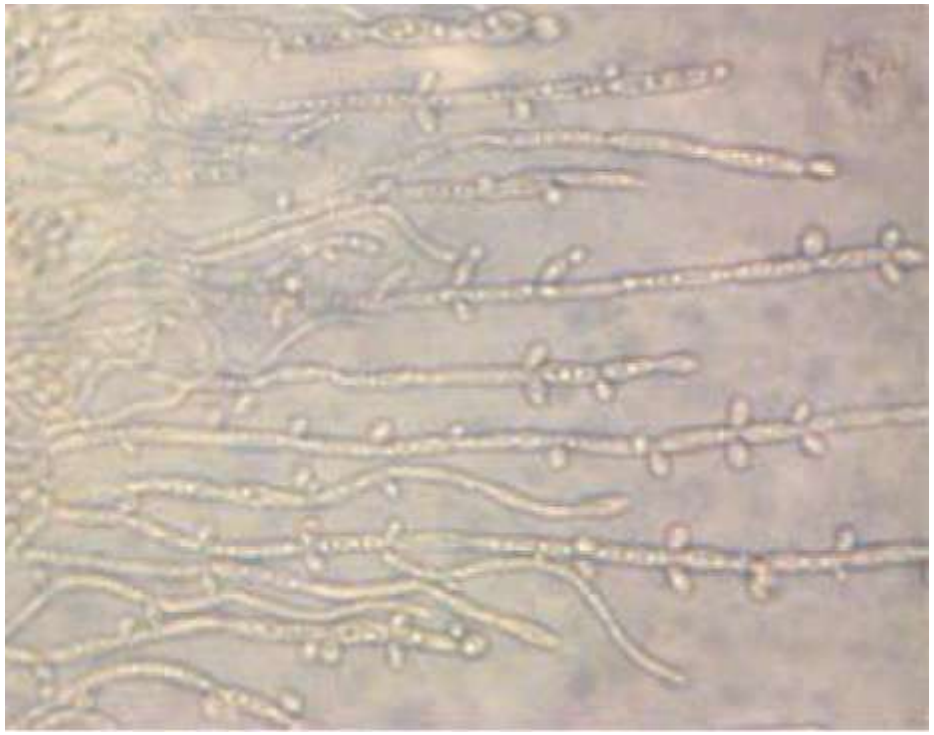


Germ tüp negatif

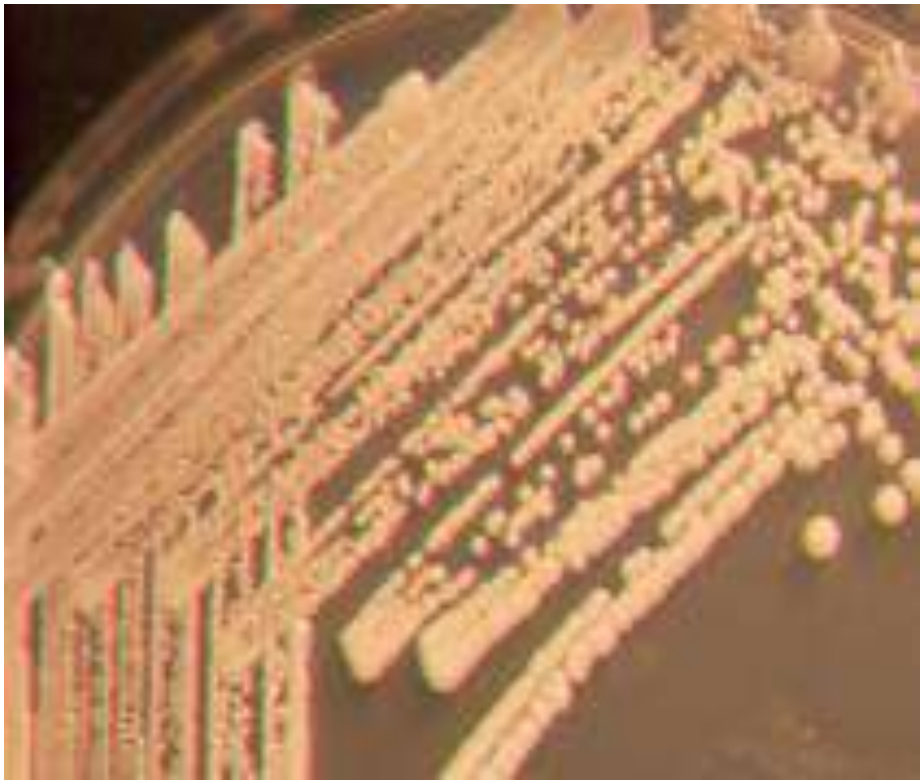
S. Silva et al, FEMS Microbiol Rev 36 (2012) 288–305



C. parapsilosis, Gram boyamada tomurcuklanan maya hücreleri



- *C.parapsilosis* Tween 80'li mısır unlu agarda morfolojik görünüm x10'luk büyütme
- Dallanma gösteren, her yöne dağılan, büyük ve kavisli olan, genellikle "dev hücreler" olarak adlandırılan psödohif yapıları



Sabouraud dextrose agarda;

beyaz, kremsi, parlak ve düz / buruşuk koloniler

- *C. parapsilosis*‘in adezyon ve biyofilm oluşturma özelliği önemli virülans faktörleridir

- Adezyon özelliği sayesinde;

- İmplante tıbbi cihazlara kolonize olur

- Glukoz veya lipid bakımından zengin ortam varlığında sistemik infeksiyonlara yol açar

- *C. parapsilosis*, *C. albicans*'a göre daha az karmaşık ve daha ince biyofilmler oluşturur

- İmplante edilmiş tıbbi cihazlarda *C. parapsilosis* biyofilmlerinin varlığı hala en büyük infeksiyon kaynağıdır

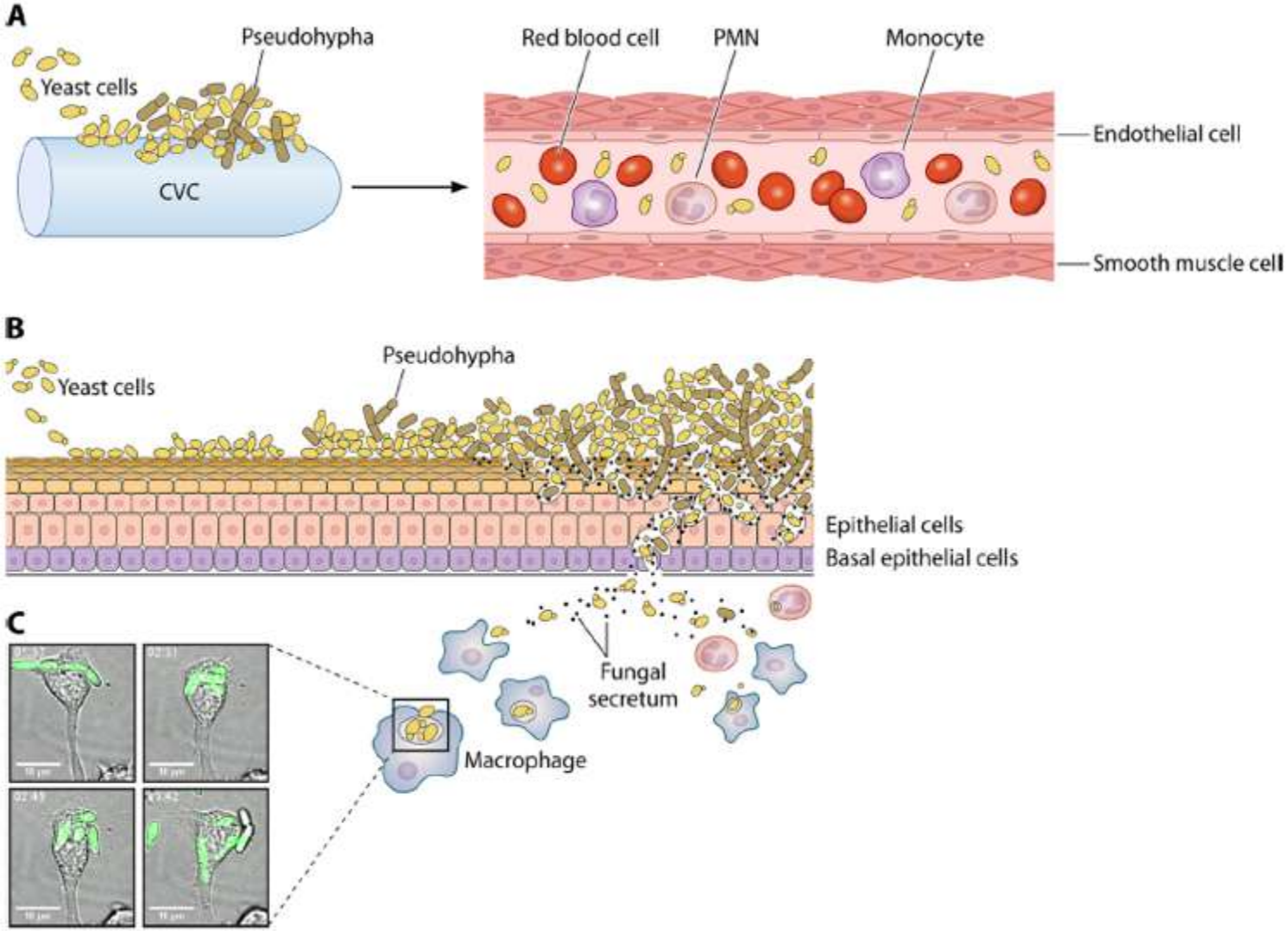
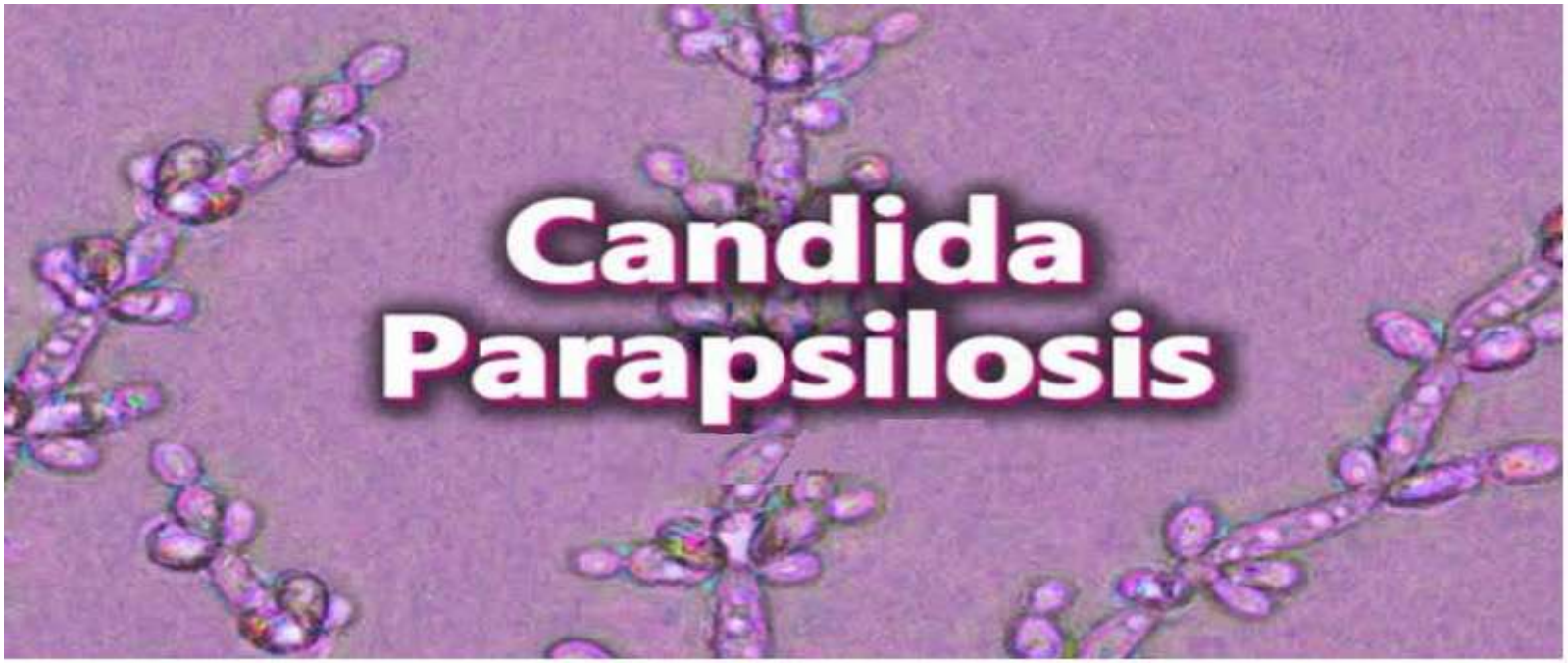


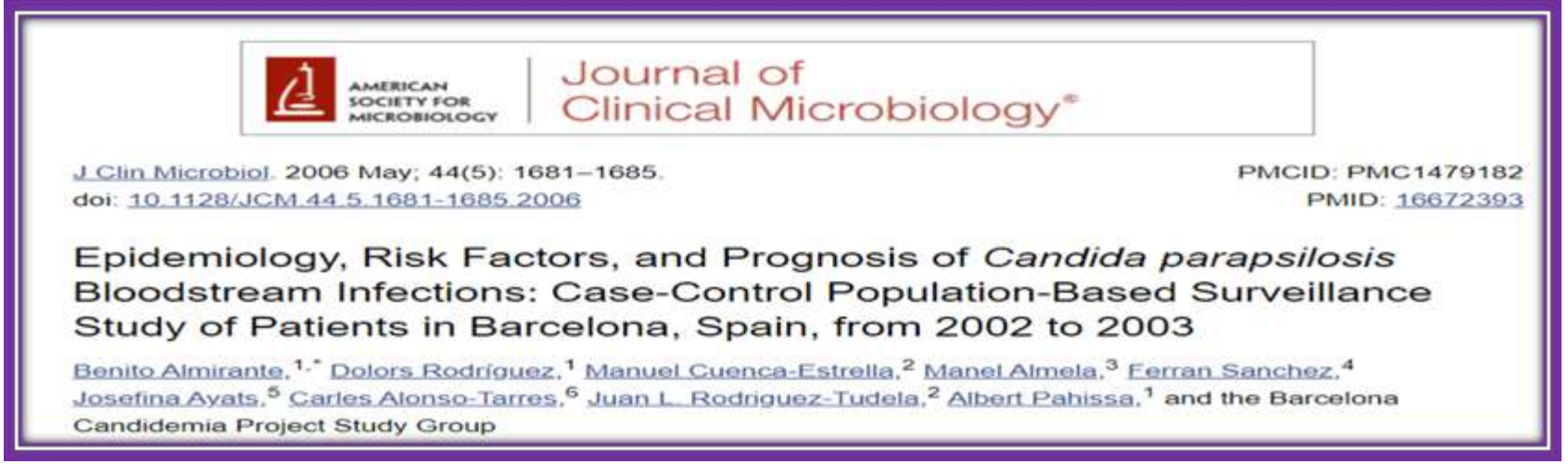
FIG 1 Transmission routes and pathogenesis of *C. parapsilosis*. (A) Central venous catheter (CVC) colonized by *C. parapsilosis* cells as the source of infection. Implantation of the contaminated device results in systemic dissemination. (B) Colonization and invasion of host epithelial surfaces. Invasion is supported by various virulence factors, including morphology transition and the release of fungal secretions such as hydrolytic enzymes. (C) Following phagocytosis, fungal cells not only survive but also may induce exocytosis or replicate within host cells. (Microscopic image series were taken by Csaba Papp.)

Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)



- Yenidoğanlarda
- Transplant alıcılarında
- Parenteral nütrisyon alan hastalarda

Önemli bir sorun



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J Clin Microbiol. 2006 May; 44(5): 1681–1685.
doi: 10.1128/JCM.44.5.1681-1685.2006

PMCID: PMC1479182
PMID: 16672393

Epidemiology, Risk Factors, and Prognosis of *Candida parapsilosis* Bloodstream Infections: Case-Control Population-Based Surveillance Study of Patients in Barcelona, Spain, from 2002 to 2003

Benito Almirante,[1,*] Dolors Rodríguez,[1] Manuel Cuenca-Estrella,[2] Manel Almela,[3] Ferran Sanchez,[4] Josefina Ayats,[5] Carles Alonso-Tarres,[6] Juan L. Rodriguez-Tudela,[2] Albert Pahissa,[1] and the Barcelona Candidemia Project Study Group

Risk Faktörleri

-İntravasküler kateterler (%97)
-Antibiyotik kullanımı (%91)
-Parenteral beslenme (%54)
-Geçirilmiş cerrahi işlem (%46)
-İmmunsupresif tedavi alma (%38)
-Malignite (%27)
-Transplant alıcısı (%16)
-Nötropeni (%12)
-Kolonizasyon varlığı (%11)

Yenidoğan risk faktörleri

-Doğum ağırlığı <1500 gr
-Prematürite
-Kolonizasyon varlığı
-Parenteral beslenme
-İntravasküler kateterler
-Antibiyotik, steroid veya H2 bloker kullanımı

- İnfeksiyon çevresel kaynaklı da olabilir;
- Ancak deri, Gİ ve solunum sistemi kolonizasyonu, sıklıkla infeksiyonlara neden olur

Pammi et al, Pediatr Infect Dis J. 2013 ; 32(5)

- Biyofilm oluşturma özelliği;
  - Hastanelerde cansız yüzeylerde
  - Sağlık çalışanlarının elleriyle ➔ nozokomiyal infeksiyonlar

- Çeşitli bölgelerde nozokomiyal salgınlar da bildirilmiş

Thomaz et al, Front. Microbiol. 9:2997.

- Özellikle ellerin subungual boşluğunda *C.parapsilosis*'in varlığı, yenidoğan YBÜ'lerinde yatay geçişi kolaylaştırır

Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)
S. Silva et al, FEMS Microbiol Rev 36 (2012) 288–305

Klinik Tablolar

Yüzeyel ve mukozal	Derin
Onikomikoz Vulvovajinit	Kandidemi Endokardit Septik artrit Peritonit Menenjit Osteomyelit

C. parapsilosis infeksiyonları genellikle *C. albicans* infeksiyonlarından daha düşük morbidite ve mortalite oranları ile sonuçlanır

ANTİFUNGAL DUYARLILIK

CLSI

TABLE 1 Epidemiological cutoff values and clinical breakpoints for systemically active antifungal agents and *Candida* spp. determined by 24-h CLSI broth microdilution methods[a]

		ECV (μg/ml)		CBP (μg/ml)			
Organism	Antifungal agent	WT	Non-WT	S	SDD	I	R
C. albicans	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤0.5	>0.5	≤2	4		≥8
	Itraconazole	≤0.12	>0.12	≤0.12	0.25–0.5		≥1
	Posaconazole	≤0.06	>0.06				
	Voriconazole	≤0.03	>0.03	≤0.12		0.25–0.5	≥1
	Anidulafungin	≤0.12	>0.12	≤0.25		0.5	≥1
	Caspofungin	≤0.12	>0.12	≤0.25		0.5	≥1
	Micafungin	≤0.03	>0.03	≤0.25		0.5	≥1
C. glabrata	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤32	>32		≤32		≥64
	Itraconazole	≤2	>2				
	Posaconazole	≤2	>2				
	Voriconazole	≤0.5	>0.5				
	Anidulafungin	≤0.25	>0.25	≤0.12		0.25	≥0.5
	Caspofungin	≤0.12	>0.12	≤0.12		0.25	≥0.5
	Micafungin	≤0.03	>0.03	≤0.06		0.12	≥0.25
C. parapsilosis	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤2	>2	≤2	4		≥8
	Itraconazole	≤0.5	>0.5				
	Posaconazole	≤0.25	>0.25				
	Voriconazole	≤0.12	>0.12	≤0.12		0.25–0.5	≥1
	Anidulafungin	≤4	>4	≤2		4	≥8
	Caspofungin	≤1	>1	≤2		4	≥8
	Micafungin	≤4	>4	≤2		4	≥8

ECVs, epidemiological cutoff values; CBPs, clinical breakpoints; WT, wild type; non-WT, non-wild type; S,susceptible; SDD, susceptible, dose dependent; I, intermediate; R, resistant.

Pfaller MA et al, J Clin Microbiol. 2012 Sep;50(9):2846-56

ANTİFUNGAL DUYARLILIK

EUCAST

***Candida* spp.**

EUCAST Antifungal Clinical Breakpoint Table v. 9.0 valid from 2018-02-12

MIC method (EUCAST standardised broth microdilution method)
Medium: RPMI1640-2% glucose, MOPS buffer
Inoculum: Final $0.5x10^5$ – $2.5x10^5$ cfu/mL
Incubation: 18-24h
Reading: Spectrophotometric, complete (>90%) inhibition for amphotericin B but 50% growth inhibition for other compounds
Quality control: *C. parapsilosis* ATCC 22019 or *C. krusei* ATCC 6258

Antifungal agent	MIC breakpoint (mg/L)															
	C. albicans		*C. dubliniensis*		*C. glabrata*		*C. krusei*		*C. parapsilosis*		*C. tropicalis*		*C. guilliermondii*		Non-species related breakpoints[1]	
	S ≤	R >	S ≤	R >	S ≤	R >	S ≤	R >	S ≤	R >	S ≤	R >	S ≤	R >	S ≤	R >
Amphotericin B	1	1	IE	IE	1	1	1	1	1	1	1	1	IE	IE	IE	IE
Anidulafungin	0.032	0.032	IE	IE	0.064	0.064	0.064	0.064	0.002	4	0.064	0.064	IE[2]	IE[2]	IE	IE
Caspofungin	Note[3]	Note[3]	IE	IE	Note[3]	Note[3]	Note[3]	Note[3]	Note[3]	Note[3]	Note[3]	Note[3]	IE[2]	IE[2]	IE	IE
Fluconazole	2	4	IE	IE	0.002	32	-	-	2	4	2	4	IE[2]	IE[2]	2	4
Isavuconazole	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Itraconazole	0.064	0.064	0.064	0.064	IE[2]	IE[2]	IE[2]	IE[2]	0.125	0.125	0.125	0.125	IE[2]	IE[2]	IE	IE
Micafungin	0.016	0.016	IE	IE	0.032	0.032	IE[4]	IE[4]	0.002	2	IE[4]	IE[4]	IE[4]	IE[4]	IE	IE
Posaconazole	0.064	0.064	0.064	0.064	IE[2]	IE[2]	IE[2]	IE[2]	0.064	0.064	0.064	0.064	IE[2]	IE[2]	IE	IE
Voriconazole[6]	0.064[5]	0.25[5]	0.064	0.25	IE	IE	IE	IE	0.125[5]	0.25[5]	0.125[5]	0.25[5]	IE[2]	IE[2]	IE	IE

Notes

1. Non-species related breakpoints have been determined mainly on the basis of PK/PD data and are independent of MIC distributions of specific species. They are for use only for organisms that do not have specific breakpoints.

2. The ECOFFs for these species are in general higher than for *C. albicans*.

3. Isolates that are susceptible to anidulafungin as well as micafungin should be considered susceptible to caspofungin, until caspofungin breakpoints have been established. Similarly, *C. parapsilosis* isolates intermediate to anidulafungin and micafungin can be regarded intermediate to caspofungin. EUCAST breakpoints have not yet been established for caspofungin, due to significant inter-laboratory variation in MIC ranges for caspofungin.

4. MICs for *C. tropicalis* are 1-2 two-fold dilution steps higher than for *C. albicans* and *C. glabrata*. In the clinical study successful outcome was numerically slightly lower for *C. tropicalis* than for *C. albicans* at both dosages (100 and 150 mg daily). However, the difference was not significant and whether it translates into a relevant clinical difference is unknown. MICs for *C. krusei* are approximately three two-fold dilution steps higher than those for *C. albicans* and, similarly, those for *C. guilliermondii* are approximately eight two-fold dilutions higher. In addition, only a small number of cases involved these species in the clinical trials. This means there is insufficient evidence to indicate whether the wild-type population of these pathogens can be considered susceptible to micafungin.

5. Strains with MIC values above the S/I breakpoint are rare or not yet reported. The identification and antifungal susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC above the current resistant breakpoint they should be reported resistant. A clinical response of 76% was achieved in infections caused by the species listed below when MICs were lower than or equal to the epidemiological cut-offs. Therefore, wild type populations of *C. albicans*, *C. dubliniensis*, *C. parapsilosis* and *C. tropicalis* are considered susceptible.

6. For *Candida* the intermediate category is introduced to acknowledge that the increased exposure obtained by iv dosing is sufficient (potentially confirmed by TDM).
There is not enough information available for the response to voriconazole of infections caused by Candida isolates with higher MICs.

ANTİFUNGAL DUYARLILIK VE DİRENÇ

- *C. glabrata*'nın aksine, *C. parapsilosis* azollere karşı yüksek duyarlılık oranına sahip
- Ekinokandinler, şüpheli veya kanıtlanmış sistemik kandidiyaziste, ampirik tedavide ilk seçenek
- *C. parapsilosis*, ekinokandinler için diğer Candida türlerinden daha yüksek MİK değerlerine sahip
- Ekinokandinlerle tedavi edilen *C. parapsilosis* kandidemisinin daha kötü sonuçlara yol açtığını veya başka bir antifungal sınıfının üstünlüğünü gösteren bir çalışma bulunmamaktadır

Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)

- *C. parapsilosis* biyofilmleri,

  - Standart amfoterisin B ve azollere karşı direnci arttırır,
  - Lipozomal amfoterisin B'ye etkisi yoktur

- Ekinokandinler ise *C. parapsilosis* biyofilmlerinin metabolik aktivitelerini azaltabilmektedir

Toth et al, Clin Microbiol Rev. 2019 Feb 27;32(2)

Journal of Global Antimicrobial Resistance 18 (2019) 230–234

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First multicentre report of in vitro resistance rates in candidaemia isolates in Turkey

Sevtap Arikan-Akdagli[a,*], Dolunay Gülmez[a], Özlem Doğan[a], Nilgün Çerikçioğlu[b], Mine Doluca Dereli[c], Asuman Birinci[d], Şinasi Taner Yıldıran[e], Beyza Ener[f], Yasemin Öz[g], Dilek Yeşim Metin[h], Süleyha Hilmioğlu-Polat[h], Ayşe Kalkancı[i], Nedret Koç[j], Zayre Erturan[k], Duygu Fındık[l]

[a] Hacettepe University Medical School, Department of Medical Microbiology, 06100 Ankara, Turkey
[b] Marmara University Medical School, Department of Medical Microbiology, Istanbul, Turkey
[c] Dokuz Eylül University Medical School, Department of Medical Microbiology, Izmir, Turkey
[d] Ondokuz Mayıs University Medical School, Department of Medical Microbiology, Samsun, Turkey
[e] University of Health Sciences, Gülhane Medical School, Department of Medical Microbiology, Ankara, Turkey
[f] Uludağ University Medical School, Department of Medical Microbiology, Bursa, Turkey
[g] Eskişehir Osmangazi University Medical School, Department of Medical Microbiology, Eskişehir, Turkey
[h] Ege University Medical School, Department of Medical Microbiology, Izmir, Turkey
[i] Gazi University Medical School, Department of Medical Microbiology, Ankara, Turkey
[j] Erciyes University Medical School, Department of Medical Microbiology, Kayseri, Turkey
[k] Istanbul University Istanbul Faculty of Medicine, Department of Medical Microbiology, Istanbul, Turkey
[l] Selçuk University Medical School, Department of Medical Microbiology, Konya, Turkey

12 Merkez katılımı,

1991 *Candida spp*

575 *C.parapsilosis*

Hacettepe Üniversitesi'nde çalışılmış

Table 1
Minimum inhibitory concentrations (MICs) following 24 h of incubation and resistance/non-wild-type (non-WT) rates obtained for all *Candida* spp. isolates included in the study ($n = 1991$).

Candida spp. (n)	Antifungal drug	MIC (μg/mL)				Rate of resistance/non-WT (%)			
		MIC_{50}	MIC_{90}	GM	Range	S	S-DD/I	R	Non-WT[a]
C. albicans (851)	AMB	1	2	0.95	0.125–2				0
	FLU	0.25	0.5	0.26	<0.125–4	99.8	0.2	0	
	ITR	0.06	0.125	0.04	≤0.015–0.5	99.4	0.6	0	
	MFG	≤0.03	≤0.03	0.03	≤0.03–0.06	100	0	0	
	POS	≤0.03	0.06	0.03	≤0.03–1				0
	VRC	≤0.015	≤0.015	0.02	≤0.015–0.06	100	0	0	
C. parapsilosis SC (575)	AMB	1	2	0.89	0.125–2				0
	FLU	1	4	0.95	≤0.125 to >64	89	3.3	7.7	
	ITR	0.06	0.25	0.07	≤0.015–1				0.2
	MFG	1	1	0.83	0.125–4	99.8	0.2	0	
	POS	≤0.03	0.25	0.05	≤0.03–0.5				3.5
	VRC	≤0.015	0.03	0.02	≤0.015–0.5	97.9	2.1	0	
C. glabrata SC (216)	AMB	1	2	1.13	0.125–2				0
	FLU	4	16	4.17	0.5–64	–	99.1	0.9	
	ITR	0.25	0.5	0.23	≤0.015–2				0
	MFG	≤0.03	≤0.03	0.03	≤0.03–0.06	100	0	0	
	POS	0.25	1	0.23	<0.03–2				0
	VRC	0.03	0.125	0.03	≤0.015–1				0.5

$MIC_{50/90}$, MIC for 50% and 90% of the isolates, respectively; GM, geometric mean; S, susceptible; S-DD, susceptible dose-dependent (for FLU and ITR); I, intermediate (for echinocandins, i.e. MFG); R, resistant; AMB, amphotericin B; FLU, fluconazole; ITR, itraconazole; MFG, micafungin; POS, posaconazole; VRC, voriconazole; SC, species complex; ECV, epidemiological cut-off value.

[a] Rate of resistance could not be determined for these drug–species combinations owing to lack of determined clinical breakpoints.

[b] Intrinsic resistance to FLU.

[c] Not determined owing to lack of established clinical breakpoints and ECVs.

[d] Includes *C. inconspicua/norvegensis* (7), *C. dubliniensis* (6), *C. pelliculosa* (3), *C. rugosa* (2), *C. utilis* (2), *C. lipolytica* (1) and *C. sake* (1). Among these, ECVs are available for FLU, VRC and POS against *C. dubliniensis* and *C. pelliculosa* and for AMB, ITR and MFG only against *C. dubliniensis*. All isolates of these species with available ECVs are wild-type for the denoted antifungal drugs.

Türk Mikrobiyoloji Cem Derg 2019;49(2):61-66
doi:10.5222/TMCD.2019.061

Araştırma / *Research Article*

Kan Örneklerinden İzole Edilen *Candida parapsilosis* Kompleks Suşlarının Tür Düzeyinde Tanımlanması ve Antifungal Duyarlılıklarının Belirlenmesi

Identification of Candida parapsilosis Complex Strains Isolated from Blood Samples at Species Level and Determination of Their Antifungal Susceptibilities

Burcu Dalyan Cilo*, Harun Ağca, Beyza Ener****

*SBÜ. Bursa Yüksek İhtisas Eğitim ve Araştırma Hastanesi, Tıbbi Mikrobiyoloji / Tıbbi Mikoloji Laboratuvarı, Bursa, Türkiye
**Uludağ Üniversitesi Tıp Fakültesi, Tıbbi Mikrobiyoloji Anabilim Dalı, Bursa, Türkiye

Tablo 2. ***Candida parapsilosis*** **tür kompleksi suşlarının (118 suş) in vitro antifungal duyarlılığı.**

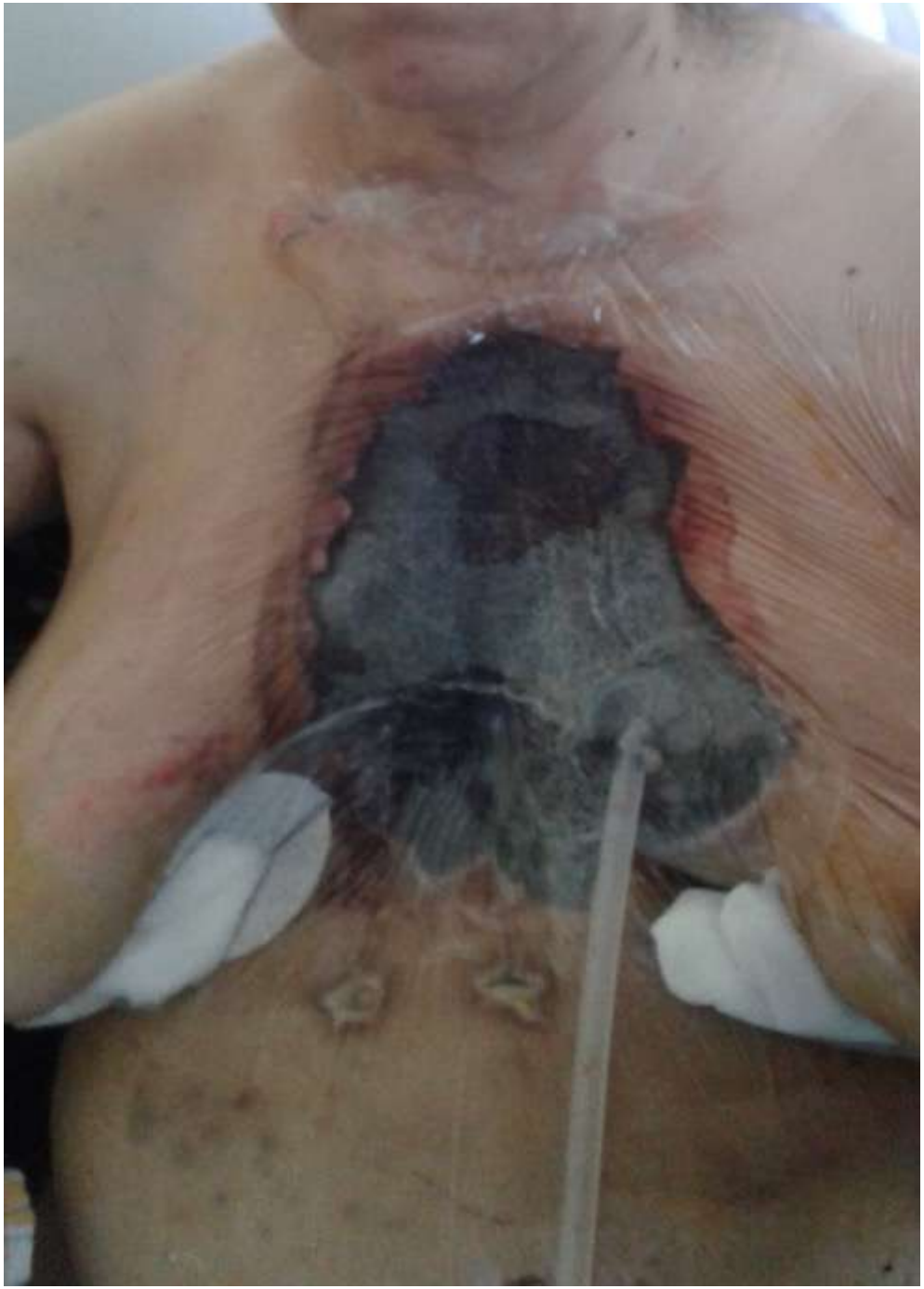
	Klinik sınır değerlere göre değerlendirme, n (%)				Epidemiyolojik eşik değerlere göre değerlendirme, n (%)	
İlaçlar	S	S-DD	I	R	WT	Non-WT
Amfoterisin B					118 (%100)	
Flukonazol	86 (%72.9)	1 (%0.8)		31 (%26.3)		
İtrakonazol					117 (%99.2)	1 (%0.8)
Vorikonazol	116 (%98.3)	2 (%1.7)				
Posakonazol					100 (%84.7)	18 (%15.3)
Anidulafungin	117 (%99.2)		1 (%0.8)			

S: Duyarlı, S-DD: Doza bağlı duyarlı, I: Orta duyarlı, R: Dirençli, WT: wild-type, non-WT: non wild-type

OLGU

- HA
- 61 yaşında, kadın hasta
- Yakınması: Ameliyat yerinde açık yara ve akıntı

- 6 ay önce koroner by-pass operasyonu sonrası sternumda yara nekrozu
- KVC kliniğinde ertapenem + siprofloksasin, debridman ve negatif basınçlı yara tedavisi uygulanmış
- 4 ay önce de operasyon bölgesinde iyileşmeyen açık yara nedeniyle Plastik Cerrahi Kliniği tarafından nakil alınmış



Plastik Cerrahi Kliniği yatışında;

- 3 kez yara debridmanı
- Derin ve kemik doku biyopsi örneği alınmış
- 3 kez bilateral pektoralis major kas ilerletme flebi + bilateral fasiyokutan ilerletme yapılmış

- Birinci derin doku ve kemik biyopsi kültürü:
- *Klebsiella pneumonia* ve *E.coli* üremesi

  Meropenem tedavisi başlanmış

- Kemik biyopsi patoloji sonucu akut osteomyelit ile uyumlu olarak bildirilmiş

- İkinci derin doku ve kemik biyopsi kültürü:
- *Candida parapsilosis* üremiş

Candida parapsilosis

Antibiyogram	Duyarlı	Az Duyarlı	Dirençli	MİK Sonuç
Posakanazol				0.12
Itrakonazol				0.12
Flucytozin				0.06
Micafungin	√			0.25
Amfoterisin B	√			0.25
Flukonazol		√		4
Vorikonazol	√			0.06
Kaspofungin	√			0.25
Anidulafungin	√			0.5

Plastik Cerrahi Kliniği yatışında;

- Meropenem tedavisine devam edilmiş
- Anidulafungin tedavisi eklenmiş

- İkinci kemik biyopsi patoloji sonucu da akut osteomyelit ile uyumlu olarak bildirilmiş

- Sternum inferior'da nekrotik alanlar devam ettiği için yeniden debridman ve negatif basınçlı yara tedavisi uygulanmış
- Toplam 7 kez debridman işlemleri yapılmış

- Son debridman sırasında alınan derin doku biyopsisinde tekrar *C. parapsilosis* üremesi olmuş

C .parapsilosis

Antibiyogram	Duyarlı	Az Duyarlı	Dirençli	MİK Sonuç
Micafungin	√			0.5
Amfoterisin B	√			0.5
Flukonazol			√	32
Vorikonazol		√		0.5
Kaspofungin	√			0.25

- İnfeksiyon Hastalıkları konsültasyonu;

  -Hastanın anidulofungin tedavisine devam edilmediği farkedilmiş, yeniden başlanmış

  -Meropenem tedavisi durdurulmuş

Plastik Cerrahi Kliniği yatışında;

- Sternum inferiordaki osteomyelitli doku dışındaki alanlar granüle, greftlerin canlı olduğu gözlenmiş
- Rekonstrüksiyon işlemi uygulanmış

- Herhangi bir cerrahi girişim yapılmayacağı belirtildi

- Tedavi yönetiminin daha iyi yapılabilmesi için sternal osteomyelit tanısıyla kliniğimize nakil alındı

İnfeksiyon Hastalıkları Kliniği yatışında;

FİZİK MUAYENE BULGULARI:

- GD iyi, şuur açık koopere oryante
- Ateş: 36.1^{0}C
- Nabız: 75/dak.
- TA: 140/60 mmHg
- SS: 16/dk
- Corpus Sternumda 4x8 cm boyutlarında, akıntılı, açık yara mevcut
- Diğer sistem muayene bulguları normal sınırlarda

Laboratuvar tetkikleri

- **WBC**: 10500/mm^3 (%75 PNL)
- **Hemoglobin**: 9,2 g/dl
- **Hematokrit: %**30
- **CRP**: 2,4 mg/dL (<0.5)
- **Sedimantasyon**: 72/h
- **BUN**: 47 mg/dL
- **Kreatinin**: 1,02 mg/dL

Osteomyelit Tanısı

- Fizik muayene
- Laboratuvar bulguları
  - Biyokimyasal inceleme
  - Kemik doku mikrobiyolojik incelemesi
  - Kemik doku patolojik incelemesi
- Direkt grafi
- Lökosit işaretli sintigrafi
- Manyetik rezonans görüntülemesi

Clinical Infectious Diseases

IDSA GUIDELINE

Clinical Practice Guideline for the Management of Candidiasis: 2016 Update by the Infectious Diseases Society of America

Peter G. Pappas,[1] Carol A. Kauffman,[2] David R. Andes,[3] Cornelius J. Clancy,[4] Kieren A. Marr,[5] Luis Ostrosky-Zeichner,[6] Annette C. Reboli,[7] Mindy G. Schuster,[8] Jose A. Vazquez,[9] Thomas J. Walsh,[10] Theoklis E. Zaoutis,[11] and Jack D. Sobel[12]

XI. What Is the Treatment for *Candida* Osteoarticular Infections?

What Is the Treatment for Candida *Osteomyelitis?*

Recommendations

74. Fluconazole, 400 mg (6 mg/kg) daily, for 6–12 months OR an echinocandin (caspofungin 50–70 mg daily, micafungin 100 mg daily, or anidulafungin 100 mg daily) for at least 2 weeks followed by fluconazole, 400 mg (6 mg/kg) daily, for 6–12 months is recommended *(strong recommendation; low-quality evidence).*
75. Lipid formulation AmB, 3–5 mg/kg daily, for at least 2 weeks followed by fluconazole, 400 mg (6 mg/kg) daily, for 6–12 months is a less attractive alternative *(weak recommendation; low-quality evidence).*
76. Surgical debridement is recommended in selected cases *(strong recommendation; low-quality evidence).*

Candida spp flukonazole duyarlı ise

Treatment of *Candida* osteoarticular infections in adults

Condition or treatment group	Therapy		
	Primary	**Alternative**	**Comments**
Osteomyelitis	Fluconazole 400 mg (6 mg/kg) orally* daily for 6 to 12 months **OR** an echinocandin (caspofungin 50 to 70 mg IV daily, micafungin 100 mg IV daily, anidulafungin 100 mg IV daily) for at least 2 weeks, then fluconazole 400 mg (6 mg/kg) orally daily for 6 to 12 months	Lipid formulation of amphotericin B 3 to 5 mg/kg IV daily for at least two weeks, followed by fluconazole 400 mg (6 mg/kg) orally daily for 6 to 12 months is a less attractive alternative	Duration of therapy is prolonged (6 to 12 months). Surgical debridement is frequently necessary.

İnfeksiyon Hastalıkları Kliniği yatışında;

- İki set kan kültürü
- Kateter kanı kültürü
- Yara yeri sürüntü kültürü alındı
- **Anidulofungin (10. günü)** tedavisine devam edildi
- Plastik Cerrahi tarafından gün aşırı pansuman ile takibi planlandı

- Kan ve yara yeri sürüntü kültüründe *Candida parapsilosis* üremesi oldu

Kan kültürü: *C. parapsilosis*

Antibiyogram	Duyarlı	Az Duyarlı	Dirençli	MİK Sonuç
Flucytosine				0.06
Posakanazol				0.015
Micafungin	√			1.0
Itrakonazol				0.015
Amfoterisin B	√			0.25
Flukonazol	√			0.5
Vorikonazol	√			0.008
Kaspofungin	√			0.5
Anidulafungin	√			1.0

Yara yeri kültürü: ***C. parapsilosis***

Antibiyogram	Duyarlı	Az Duyarlı	Dirençli	MİK Sonuç
Posakanazol				0.12
Itrakonazol				0.25
Flucytozin				0.06
Micafungin	√			0.5
Amfoterisin B	√			0.5
Flukonazol			√	8
Vorikonazol		√		0.5
Kaspofungin	√			0.5
Anidulafungin	√			0.5

İnfeksiyon Hastalıkları Kliniği yatışında;

- Santral venöz kateteri çekildi
- Kateter ucu kültürü gönderildi
- Gün aşırı kan kültürü alındı

❖Öncesinde tekrarlayan debridmanları yapılmış hastanın geniş sternal eksizyon işleminin mortal seyredeceği belirtildi ve operasyona uygun görülmedi

- Kaynak kontrolü için **Kalp ve Damar Cerrahisi konsültasyonu** istendi

İnfeksiyon Hastalıkları Kliniği takibinin 15. gününde;

- Kaynak kontrolü sağlanamaması
- **Anidulofungin tedavisi** altında üremelerin devam etmesi

- Tedaviye **Lipozomal Amfoterisin B** eklenmesine karar verildi.

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Mar. 2007, p. 941–945 Vol. 51, No. 3
0066-4804/07/$08.00+0 doi:10.1128/AAC.00880-06

Caspofungin in Combination with Amphotericin B against *Candida parapsilosis*▽

Francesco Barchiesi,[1]* Elisabetta Spreghini,[1] Serena Tomassetti,[1] Daniele Giannini,[2] and Giorgio Scalise[1]

Istituto di Malattie Infettive e Medicina Pubblica,[1] and Centro di Gestione Presidenza Medicina e Chirurgia,[2] Università Politecnica delle Marche, Ancona, Italy

- 3 klinik izolatta
- Checkerboard broth mikrodilüsyon ile
- Kaspofungin ile Amfoterisin B arasında antagonizma saptamamışlar
- Pozitif bir etkileşim olduğunu belirtmişler

ISHAM
INTERNATIONAL SOCIETY FOR HUMAN AND ANIMAL MYCOLOGY

Medical Mycology, 2017, 55, 859–868
doi: 10.1093/mmy/myx006
Advance Access Publication Date: 16 February 2017
Original Article

Original Article

In vitro combination therapy with isavuconazole against *Candida* spp.

Aspasia Katragkou[1], Matthew McCarthy[1], Joseph Meletiadis[2], Kaiser Hussain[1], Patriss W. Moradi[1], Gittel E. Strauss[1], Kyaw L. Myint[1], Myo H. Zaw[1], Laura L. Kovanda[3], Ruta Petraitiene[1], Emmanuel Roilides[4], Thomas J. Walsh[1,5,6] and Vidmantas Petraitis[1,*]

- Time-kill yöntemiyle
- *C. albicans* ve *C. parapsilosis* izolatları
- İsavukonazole ve mikafungin kombinasyonunun konsantrasyona bağlı sinerjizm varlığını
- İsavukonazole ve amfoterisin kombinasyonunun ise farklılık göstermediğini belirtmişler

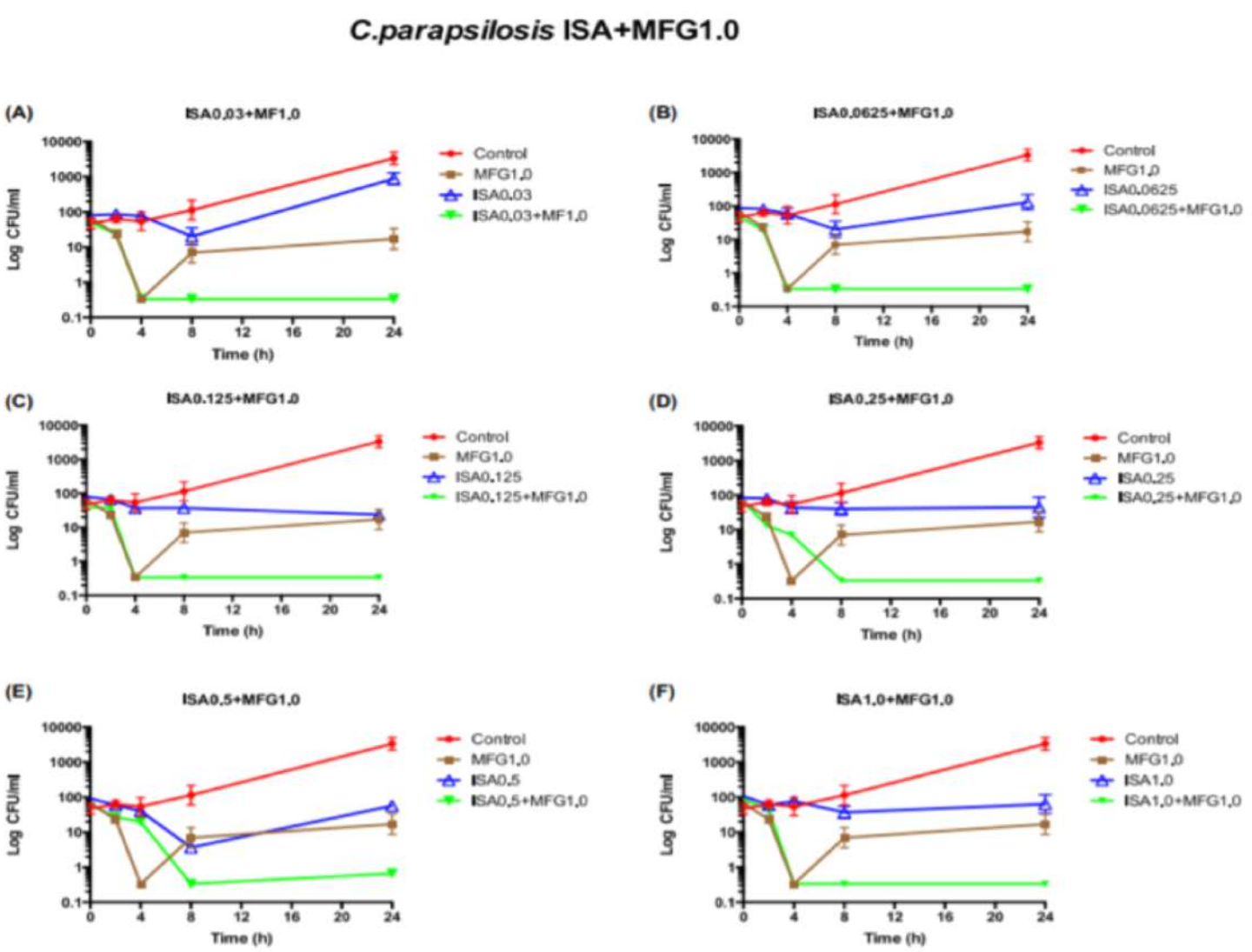


Figure 2. Time-kill assay of isavuconazole and micafungin against *C. parapsilosis*. The effects of treatment with concentrations of isavuconazole at 0.03, 0.0625, 0.125, 0.25, 0.5, 1.0, and micafungin at 1.0 μg/ml alone and in combination were studied in relation to no treatment (growth control). Data are plotted as the means ± SE from three separate experiments for each growth curve. As the SE was small for several time points, the error bars may not always be apparent in the time-kill curves. MFG, micafungin; ISA, isavuconazole.

İnfeksiyon Hastalıkları Kliniği yatışında;

Lipozomal Amfoterisin B'nin;

- Bir gram test dozu uygulanması sırasında 10 dakika içinde hastada bradikardi ve hipotansiyon gelişti

- Hastanın kardiyak arrest riski ve sternumun açık olması nedeni ile resüsitasyon ihtiyacı olması halinde müdahale edilemeyeceğinden tedaviye eklenemedi

ANTİFUNGAL DUYARLILIK

CLSI

TABLE 1 Epidemiological cutoff values and clinical breakpoints for systemically active antifungal agents and *Candida* spp. determined by 24-h CLSI broth microdilution methods[a]

		ECV (μg/ml)		CBP (μg/ml)			
Organism	Antifungal agent	WT	Non-WT	S	SDD	I	R
C. albicans	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤0.5	>0.5	≤2	4		≥8
	Itraconazole	≤0.12	>0.12	≤0.12	0.25–0.5		≥1
	Posaconazole	≤0.06	>0.06				
	Voriconazole	≤0.03	>0.03	≤0.12		0.25–0.5	≥1
	Anidulafungin	≤0.12	>0.12	≤0.25		0.5	≥1
	Caspofungin	≤0.12	>0.12	≤0.25		0.5	≥1
	Micafungin	≤0.03	>0.03	≤0.25		0.5	≥1
C. glabrata	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤32	>32		≤32		≥64
	Itraconazole	≤2	>2				
	Posaconazole	≤2	>2				
	Voriconazole	≤0.5	>0.5				
	Anidulafungin	≤0.25	>0.25	≤0.12		0.25	≥0.5
	Caspofungin	≤0.12	>0.12	≤0.12		0.25	≥0.5
	Micafungin	≤0.03	>0.03	≤0.06		0.12	≥0.25
C. parapsilosis	Amphotericin B	≤2	>2				
	Flucytosine	≤0.5	>0.5				
	Fluconazole	≤2	>2	≤2	4		≥8
	Itraconazole	≤0.5	>0.5				
	Posaconazole	≤0.25	>0.25				
	Voriconazole	≤0.12	>0.12	≤0.12		0.25–0.5	≥1
	Anidulafungin	≤4	>4	≤2		4	≥8
	Caspofungin	≤1	>1	≤2		4	≥8
	Micafungin	≤4	>4	≤2		4	≥8

ECVs, epidemiological cutoff values; CBPs, clinical breakpoints; WT, wild type; non-WT, non-wild type; S,susceptible; SDD, susceptible, dose dependent; I, intermediate; R, resistant.

Pfaller MA et al, J Clin Microbiol 2012 Sep;50(9):2846-56

- *C.parapsilosis* epidemiyolojik sınır değerinin (0.25µg/ml) Posakonazol klinik kullanımı için cut off olarak değerlendirilebileceği bildirilmiş

Pfaller MA et al, J Clin Microbiol. 2011 Nov;49(11):3800-4
Espinel-Ingroff A et al, Antimicrob Agents Chemother. 2014;58(4):2006 12

- Hastamız klinik izolatlarında posakonazol MİK'i 0.015 µg/ml(kan) ve 0.12 µg/ml (kemik +derin doku) cut off değerinin altında saptandı

- Anidulofungin tedavisinin 25. gününde ikinci antifungal olarak **posakonazol** eklendi

İnfeksiyon Hastalıkları Kliniği takibinin 30. gününde

- Takiplerinde yara yeri akıntısında artış ve kötü koku gelişmesi
- CRP (11 mg/dL) ve sedimantasyon (80/h) da artış

- İkili antifungal tedaviye **Meropenem 3x1gr + Teikoplanin 1x400mg** eklendi
- Yara yeri pansumanının octenisept (octenidine dihydrochloride) ile yapılması kararlaştırıldı

Skin Pharmacol Physiol. 2018;31(1):28-58. doi: 10.1159/000481545. Epub 2017 Dec 21.

Consensus on Wound Antisepsis: Update 2018.

Kramer A[1], Dissemond J, Kim S, Willy C, Mayer D, Papke R, Tuchmann F, Assadian O.

Author information

Abstract

Wound antisepsis has undergone a renaissance due to the introduction of highly effective wound-compatible antimicrobial agents and the spread of multidrug-resistant organisms (MDROs). However, a strict indication must be set for the application of these agents. An infected or critically colonized wound must be treated antiseptically. In addition, systemic antibiotic therapy is required in case the infection spreads. If applied preventively, the Wounds-at-Risk Score allows an assessment of the risk for infection and thus appropriateness of the indication. The content of this updated consensus recommendation still largely consists of discussing properties of octenidine dihydrochloride (OCT), polihexanide, and iodophores. The evaluations of hypochlorite, taurolidine, and silver ions have been updated. For critically colonized and infected chronic wounds as well as for burns, polihexanide is classified as the active agent of choice. The combination 0.1% OCT/phenoxyethanol (PE) solution is suitable for acute, contaminated, and traumatic wounds, including MRSA-colonized wounds due to its deep action. For chronic wounds, preparations with 0.05% OCT are preferable. For bite, stab/puncture, and gunshot wounds, polyvinylpyrrolidone (PVP)-iodine is the first choice, while polihexanide and hypochlorite are superior to PVP-iodine for the treatment of contaminated acute and chronic wounds. For the decolonization of wounds colonized or infected with MDROs, the combination of OCT/PE is preferred. For peritoneal rinsing or rinsing of other cavities with a lack of drainage potential as well as the risk of central nervous system exposure, hypochlorite is the superior active agent. Silver-sulfadiazine is classified as dispensable, while dyes, organic mercury compounds, and hydrogen peroxide alone are classified as obsolete. As promising prospects, acetic acid, the combination of negative pressure wound therapy with the instillation of antiseptics (NPWTi), and cold atmospheric plasma are also subjects of this assessment.

Acta Med Croatica. 2016 Mar;70(1):33-42.

[THE ROLE OF ANTISEPTICS AND STRATEGY OF BIOFILM REMOVAL IN CHRONIC WOUND].

[Article in Croatian]

Kucisec-Tepes N.

Abstract

Chronic wound does not heal within the expected time frame because it remains in the inflammation phase of healing. The reason for this is the presence of necrotic tissue and a large number of microorganisms, primarily bacteria that secrete the biofilm, along with ischemia, hypoxia and edema. Biofilm is present in 90% of chronic wounds and 6% of the acute ones. Biofilm is a corporative association of microbes which adhere to the surface of the wound, guided by quorum sensing molecules. The association is surrounded by a moisturizing matrix of extracellular polymeric substances (slime) which protect the microbes from the impact of antibiotics, antiseptics, macro-organism defense and stress. Biofilm is the primary cause of the wound chronicity because it causes permanent inflammation, delayed granulation tissue formation and migration of epithelium cells, thus providing a reservoir of microbes that lead to infection of the chronic wound. The aim of good clinical practice is to enable healing of a chronic wound within the expected time frame. In order to achieve this aim, it is necessary to reduce and thoroughly remove the biofilm from the wound and prevent its reappearance. This is achieved by the application of active anti-biofilm compounds and procedures that disintegrate the quorum sensing molecules, degrade the extracellular polymeric substances and block adherence to the surfaces. Recent researches have shown that the application of antiseptics is effective in the prevention of infection and is a support to targeted treatment. However, the fact is that only some antiseptics are applicable to chronic wounds and can have an impact on biofilms of the primary infective agents such as Staphylococcus spp., Streptococcus spp., and Pseudomonas aeruginosa. Effective antiseptics are octenidine dihydrochloride, polyhexanides, povidone and cadexomer iodine, nanocrystal silver and Manuka-type honey. Immobile biofilm is a persistent problem of chronic and chronic infected wounds. In fact, there is no isolated therapeutic procedure or an individual antiseptic that can fully destroy the biofilm. For this reason, modern strategy in the management of chronic wound applies a multimodal approach which combines mechanical-chemical procedures such as debridement, antiseptics, and antimicrobial supportive compresses. Debridement creates a therapeutic 'window' for the action of antiseptics and antibiotics in a 72-hour period, which enables removal of the biofilm and active destruction of the sessile and planktonic bacteria. This approach also prevents de novo formation of the biofilm. The above procedures must be intensively repeated, and antiseptics and supportive compresses changed, depending on the phase of the wound bed and comorbidity factors in the patient. The results of clinical studies show that only such a proactive approach to chronic wound enables achievement of healing within the expected period of time.

J Hosp Infect. 2019 May;102(1):120-124. doi: 10.1016/j.jhin.2018.09.008. Epub 2018 Sep 25.

Antifungal activity of octenidine dihydrochloride and ultraviolet-C light against multidrug-resistant Candida auris.

Ponnachan P[1], Vinod V[2], Pullanhi U[3], Varma P[4], Singh S[5], Biswas R[2], Kumar A[6].

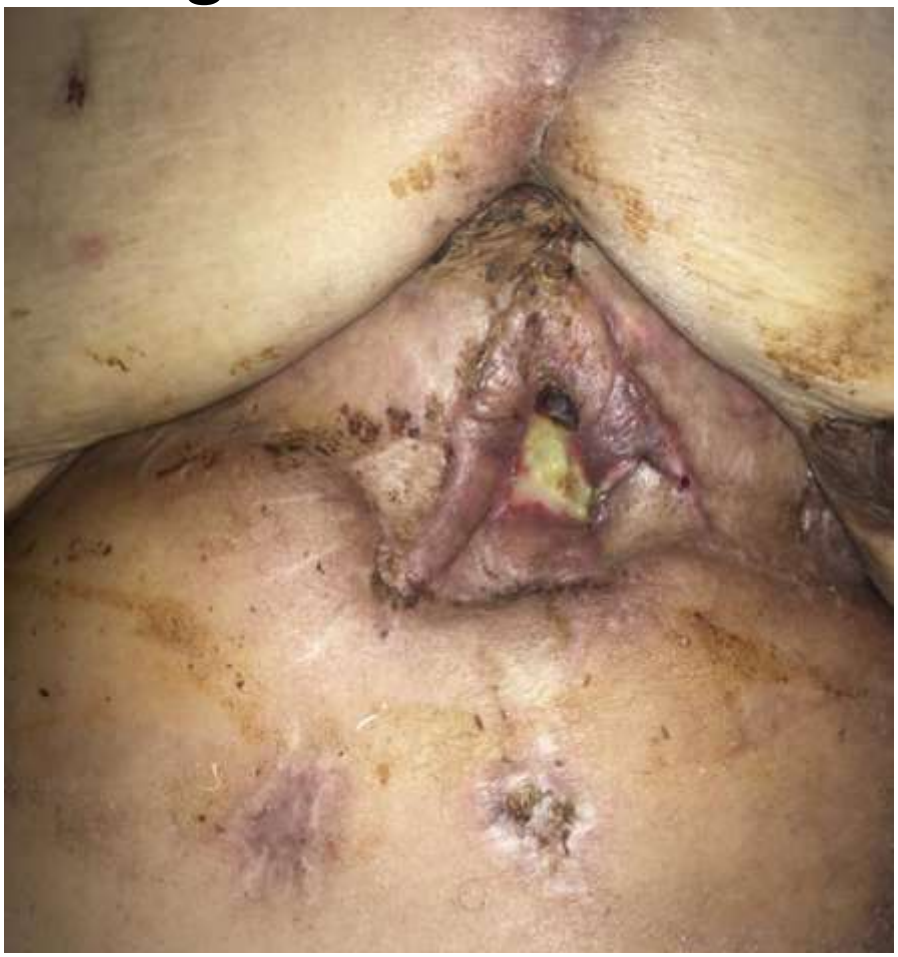
⊕ Author information

Abstract

Outbreaks due to multidrug-resistant Candida auris have emerged as a large threat to modern medicine. Since skin colonization and environmental contamination have been identified as a precursor for outbreaks, we evaluated the antifungal activity of ultraviolet-C light using mercury vapour lamp with a peak emission of 254 ± 2 nm and octenidine dihydrochloride against C. auris clinical isolates. Octenidine dihydrochloride was found effective at significantly lower concentrations (0.00005-0.0004%) than those currently used in the clinical setting (0.05-0.1%). Scanning electron microscopy images show destruction of the organism within 6 h of exposure to 0.0005% octenidine dihydrochloride. Ultraviolet-C light could kill all C. auris with 15 min exposure.

Antibiyotik Tedavinin 15. gününde + 2’li Antifungal tedavinin 30. gününde ;

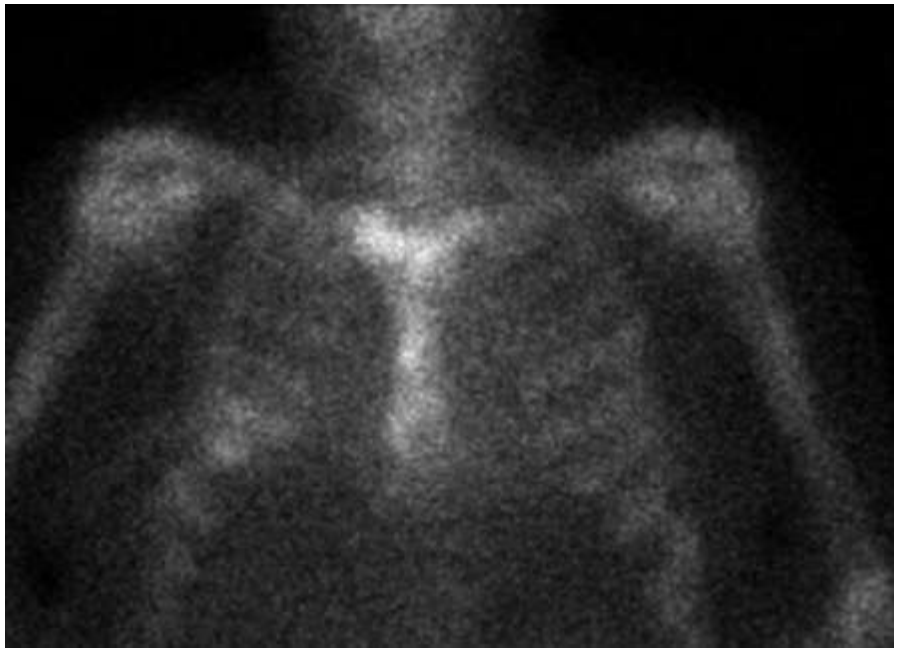
- Yara yerinde kötü koku geriledi
- CRP (4 mg/dL) ve sedimantasyon (58/h) değerleri geriledi
- Yara yeri sürüntü ve kan kültürlerinde üreme olmadı



İnfeksiyon Hastalıkları Kliniği yatışında;

- İkili antifungal tedavinin 40. gününde hiperbarik ve oksijen tedavisi yapılmaya başlandı
- Sualtı Hekimliği ve Hiperbarik Tıp Uzmanı tarafından yara yeri pansumanın borik asit ile yapılması önerildi
- Gün aşırı yapılan pansumanlara borik asit ile devam edildi
- Kalp yetmezliği sebebi ile HBOT 15 gün yapılabildi

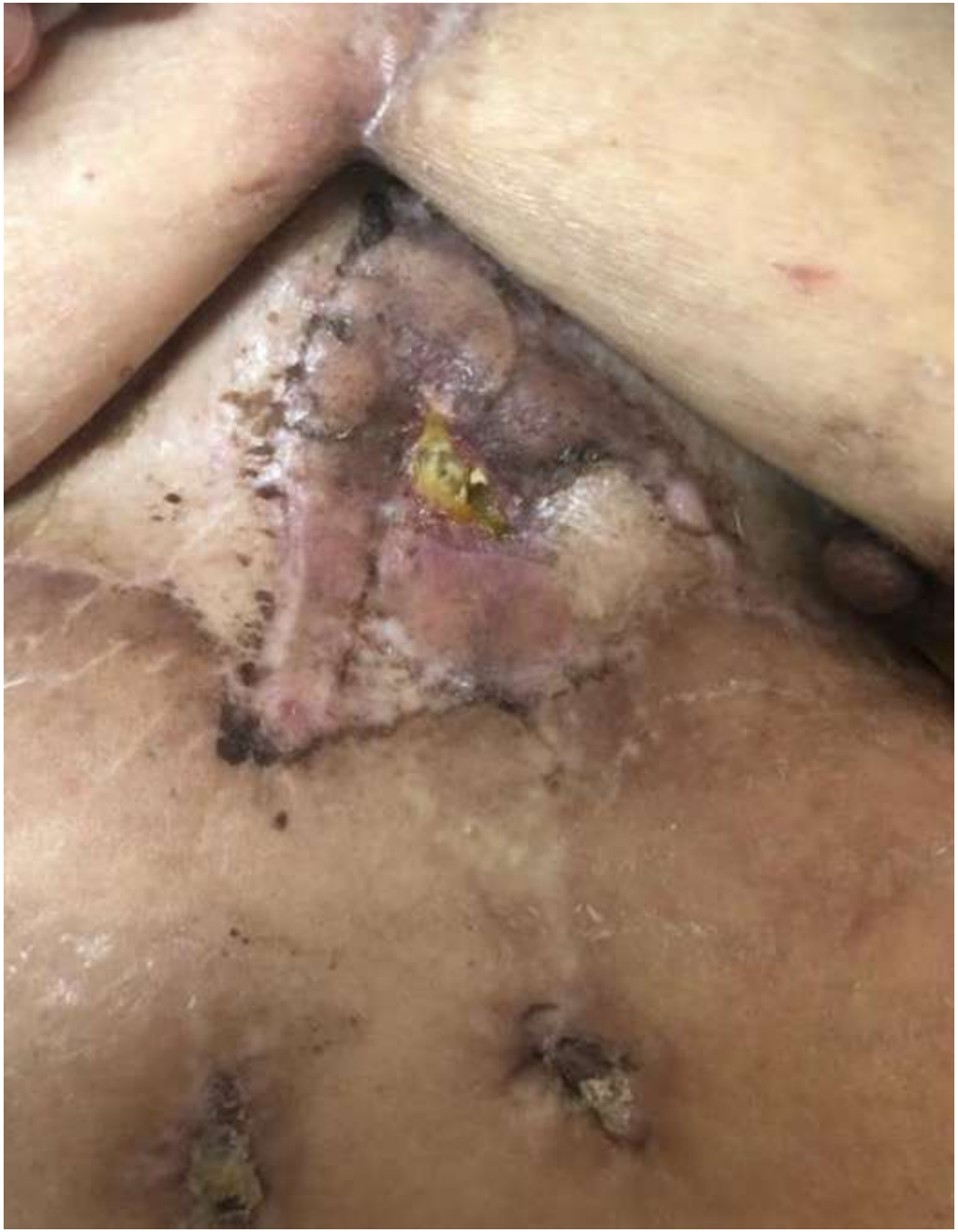
- Hastanın osteomyelit durumunun değerlendirilmesi için sintigrafi çekildi



- Geç görüntüde manibrium sternide ve korpus sternide rölatif artmış radyoaktivite tutulumları gözlenmektedir
- Bypass operasyonuna sekonder sternotomisi olan hastada tanımlanan bulgular nonspesifik olarak değerlendirildi

- Sedimentasyonu 40/h , CRP 3 mg/dl gerileyen hastanın;

  - Meropenem + Teikoplanin tedavisi 8 haftaya
  - Anidulofungin + Posakonazol tedavisi 10 haftaya tamamlandı



- Posakonazol (PO)
- Trimetoprim/Sulfametaksazol (PO)
- Teikoplanin 400 mg (IM) ile

kontrole gelmek üzere taburcu edildi

MEDİASTİNİT

- *Candida* mediastiniti genellikle torasik cerrahi işlemlerden sonra ortaya çıkar
- Etkilenen kemiğin debridmanı, mediastinal drenaj ve antifungal tedavi kür için esas
- Sternal tutulum varsa, tedavi süresi altı ay veya daha uzun olabilir
- Klinik cevabı izlemede, oral tedavi süresini belirlemede
  - Sedimantasyon
  - CRP
  - BT takibi önerilir

Eur J Clin Microbiol Infect Dis (2014) 33:135–141
DOI 10.1007/s10096-013-1939-0

ARTICLE

Treatment and outcomes of *Candida* osteomyelitis: review of 53 cases from the PATH Alliance® registry

D. Neofytos · S. Huprikar · A. Reboli · M. Schuster · N. Azie · B. Franks · D. Horn

- Çok merkezli, prospektif, gözlemsel
- 2004-2008 yılları arası
- Kemik doku kültürü ve histopatolojik inceleme ile Candida osteomyeliti tanısı almış 53 hasta
- 10 hastada *C.parapsilosis* etken
  - -5 hasta flukonazol 2 hasta ekinokandin ile tedavi
  - -7 hastaya debridman yapılmış
  - -1 hasta flukonazol ile başlanmış direnç yüzünden vorikonazol
  - -1 hasta L amfoterisin B ile başlanmış yan etki gelişince vorikonazol
  - -12 hafta tedavi
  - -2 hasta ex

Yingling et al. Patient Safety in Surgery (2017) 11:31
DOI 10.1186/s13037-017-0146-9

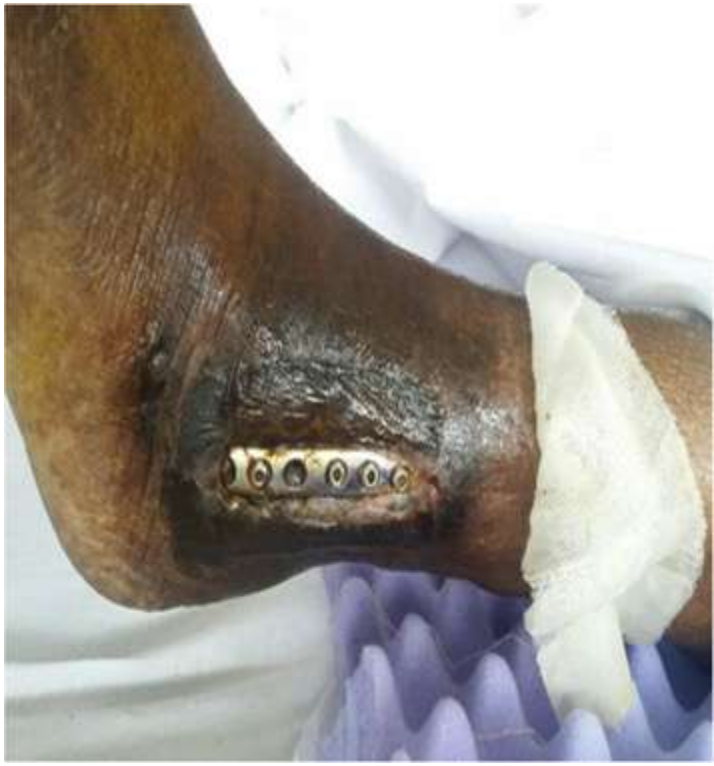
Patient Safety in Surgery

CASE REPORT Open Access

A rare case of *Candida parapsilosis* osteomyelitis: a literature review and proposed treatment algorithm

John Michael Yingling, Li Sun, Richard Yoon* and Frank Liporace

- 21 yıl önce internal fiksasyon
- 10 yıldır antiretroviral tedavi
- Operasyon sırasında alınan örnekte *C.parapsilosis* üremesi
- Flukonazol tedavisi başlanıyor
- Derin ven trombozu gelişince tedaviye kaspofungin ekleniyor



Clin Infect Dis. 1997 Sep;25(3):608-13.

Candidal mediastinitis: an emerging clinical entity.

Clancy CJ[1], Nguyen MH, Morris AJ.

- 1985-1993 yılları arası 9 hasta
- Torasik cerrahiden ortalama 11 gün sonra
- Hastaların hepsi antibiyotik tedavisi almış
- Etken *C.albicans*
- 7 hasta da komşuluk ya da hematojen yayılımla
- En az 6 hafta antifungal tedavi ile birlikte agresif cerrahi debridman
- 3 hastada tanıda gecikme
- 5 hasta ex

Clin Infect Dis. 2002 Dec 1;35(11):1316-20. Epub 2002 Nov 7.

Candida albicans sternal wound infections: a chronic and recurrent complication of median sternotomy.

Malani PN[1], McNeil SA, Bradley SF, Kauffman CA.

- 11 hastada koroner arter bypass greftleme sonrası derin sternal yara enfeksiyonu
- 6 hastada sternal osteomyelit,
- 1 hastada osteomyelit ve mediastinit
- 1 hasta amfoterisin B, diğerleri flukonazol ile tedavi edildi
- 6 hastada insizyon ve drenaj
- Ortalama tedavi süresi 6 ay
- 3 hastada nüks

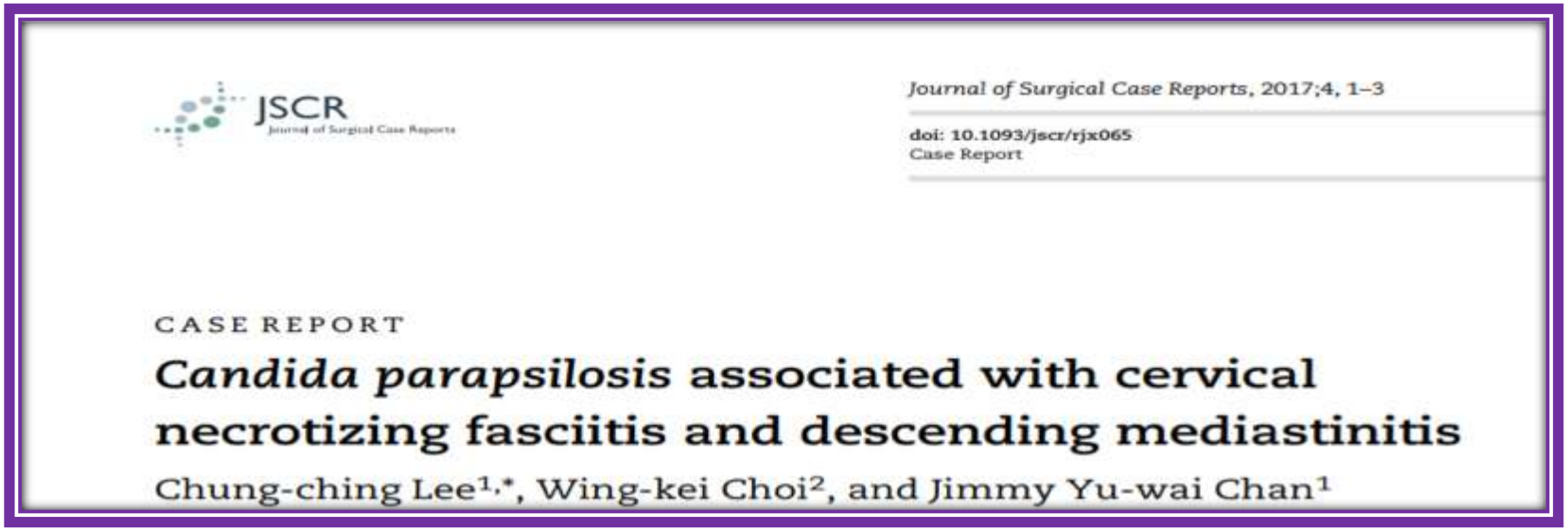
Hindawi Publishing Corporation
Case Reports in Infectious Diseases
Volume 2015, Article ID 543685, 4 pages
http://dx.doi.org/10.1155/2015/543685

Case Report

Enterococcus faecium Mediastinitis Complicated by Disseminated *Candida parapsilosis* Infection after Congenital Heart Surgery in a 4-Week-Old Baby

Hanna Renk,[1] Felix Neunhoeffer,[1] Florian Hölzl,[2] Michael Hofbeck,[1] and Matthias Kumpf[1]

- Gecikmeli sternum kapanmasından sonra mediastinit riski %10
- *C.parapsilosis* plevral sıvı, BAL, CVP ve idrardan izole edilmiş
- 6 hafta L amfoterisin B ile tedavi edilmiş


JSCR
Journal of Surgical Case Reports

Journal of Surgical Case Reports, 2017;4, 1–3

doi: 10.1093/jscr/rjx065
Case Report

CASE REPORT

Candida parapsilosis associated with cervical necrotizing fasciitis and descending mediastinitis

Chung-ching Lee[1,*], Wing-kei Choi[2], and Jimmy Yu-wai Chan[1]

- 57 yaşında kadın hasta
- İmmünkompetan
- Kan ve doku kültüründe *C.parapsilosis* üremesi
- Debridman ve ekinokandin ile tedavi
- 2 ay


TEŞEKKÜRLER