

# ATEŐLİ BÖBREK NAKLİ HASTASININ YÖNETİMİ

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# BÖBREK YETMEZLİĞİ







# ATEŞ

- ENFEKSİYON
- REJEKSİYON
- MALİGNİTE
- İLAÇLAR



# Fever of unknown origin in renal transplant patients with tacrolimus

**Drug Fever Caused by Mycophenolate Mofetil in a Renal Transplant Recipient—A Case Report**

**Fever and pneumonitis induced by enteric-coated mycophenolate sodium in a patient after kidney transplantation**

**Sirolimus-Induced Drug Fever in a Renal Transplant Patient: A Case Report**

**Fatal Outcome Due to Sirolimus-Induced Acute Hepatitis, Myelosuppression and Fever in a Kidney Allograft Recipient**

- Ateş nedeniyle yatırılan pediyatrik renal tx
- n=52, 168 yatış
- Enfeksiyon: 153 (%91)
- Malignite (PTLD): 2
- Rejeksiyon: 1
- Girişim sonrası ateş: 1
- Sebebi bulunamayan: 11

# ENFEKSİYONLAR

- Hastane yatışlarının en sık nedeni
  - Uzun yatış süreleri
- En sık mortalite nedeni
- Tx hst'da dirençli m.o. daha sık



## North American Pediatric Renal Transplant Cooperative Study

**Table 2:** Hospitalization experience (%) for selected causes and follow-up period in early and late transplant cohorts

Transplant year	Time period	Viral infections	All infections	Acute rejection
1987	1–6 months	15.7	27.9	32.8
2000	1–6 months	14.2	24.0	12.0
1987	6–24 months	11.1	20.4	23.8
2000	6–24 months	16.6	30.8	14.6

- İS Potent, ancak non-selektif
- Zamanla AR ↓, Enf ↓ yok
- Anti-mikrobiyal prof. yaygın kullanımı ile
  - pneumocystis carinii gibi enf belirgin azalmış
- Sıradan bakteriler tx hastalarında hayatı tehdit edici enf yol açabiliyor

# Enfeksiyona duyarlılık

- Pre-tx tanı ve aldığı tedaviler
  - İS, anti-mikrobiyal
- İndüksiyon tedavisi
- İdame tedavinin içeriği, dozu ve süresi
  - Kümülatif doz
- Mukokutanöz bariyerin bozulması
  - Kateter, dren, stent
- Allta yatan immün bozukluklar
  - Hipogamaglobulinemi
  - Kompleman eks.
  - Otoimmün hast (SLE)
- Nötropeni
  - İlaç-ilişkili
- Komorbiditeler
  - Malnütrisyon
  - DM
- İmmün modülatuar enf.
  - CMV

# Korunma

- Pre-tx dönem
  - Serolojik durum
  - Aşılama
  - Aile SED
  - Aile eğitimi – hijyen
- Antibiyotik profilaksisi

# Antibiyotik profilaksisi

- Meta-analiz
- 6 çalışma, n=545
- Bakteremi ve sepsis %87 ↓
- Bakteriüri %60 ↓
- Dirençli bakteri gelişimi ↑ (?)
- Greft kaybı: etkisiz
- Mortalite: etkisiz

# Enf. nedenleri

- İLK 1 AY
  - Stent ilişkili İYE
  - Yara yeri enf.
  - Batın içi abse
  - Donör kaynaklı enf
- 1-6 ay
  - Fırsatçı enfeksiyonlar
  - Latent enf. aktivasyonu
- >6 AY
  - Toplum kaynaklı enf.

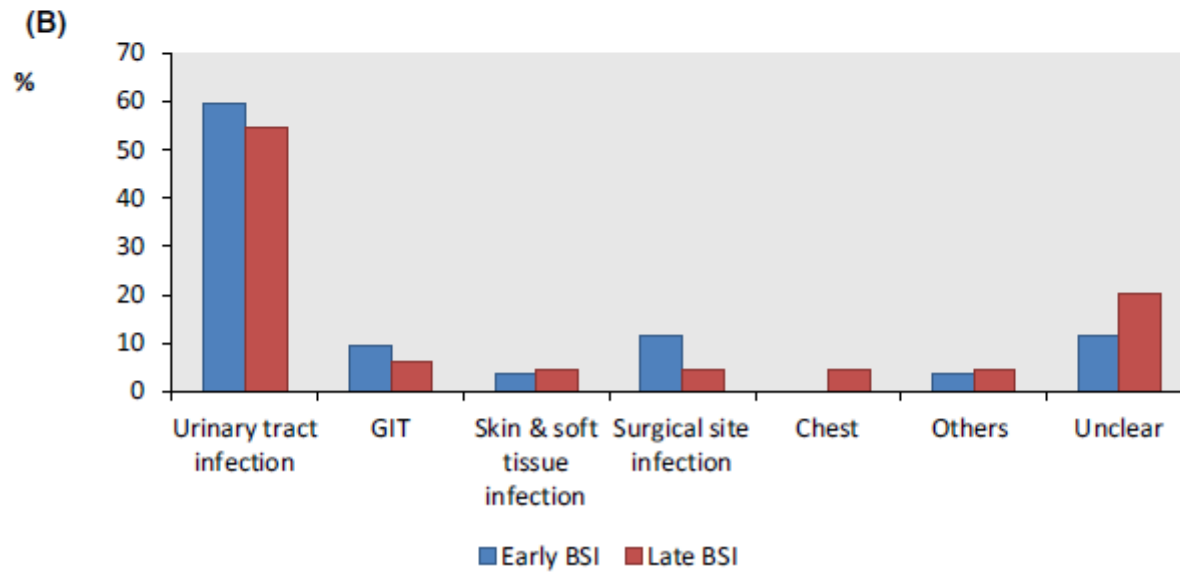
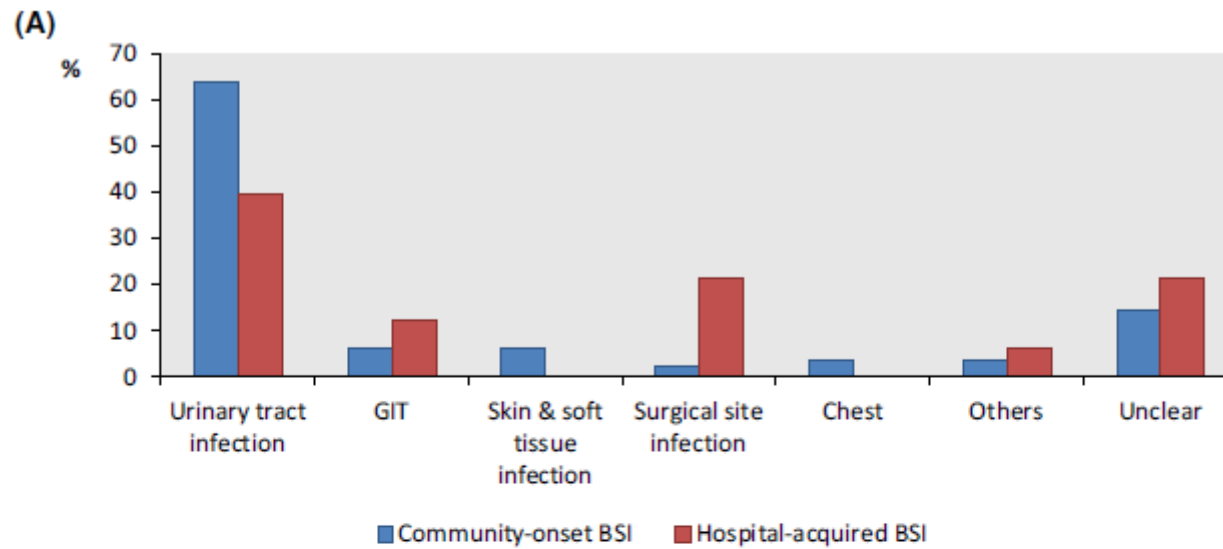
**TABLE 4** Types of proven and probable bacterial infections in febrile pediatric renal and renal and liver recipients

Type of infection	Number of cases (% of total bacterial infections)
<b>Proven bacterial infections</b>	
UTI, total	30 (35.3)
<i>Escherichia coli</i>	13 (15.3)
<i>Klebsiella</i> sp.	7 (8.2)
<i>Enterococcus</i> sp.	6 (7.1)
<i>Pseudomonas</i> sp.	2 (2.6)
<i>Staphylococcus</i> coagulase negative	1 (1.2)
<i>Enterobacter</i> sp.	1 (1.2)
<b>UTI and bacteremia, total</b>	
<i>Escherichia coli</i>	1 (1.2)
<i>Klebsiella oxytoca</i> <sup>a</sup>	1 (1.2)
<i>Staphylococcus</i> coagulase negative <sup>a</sup>	1 (1.2)
<i>Haemophilus influenzae</i>	1 (1.2)

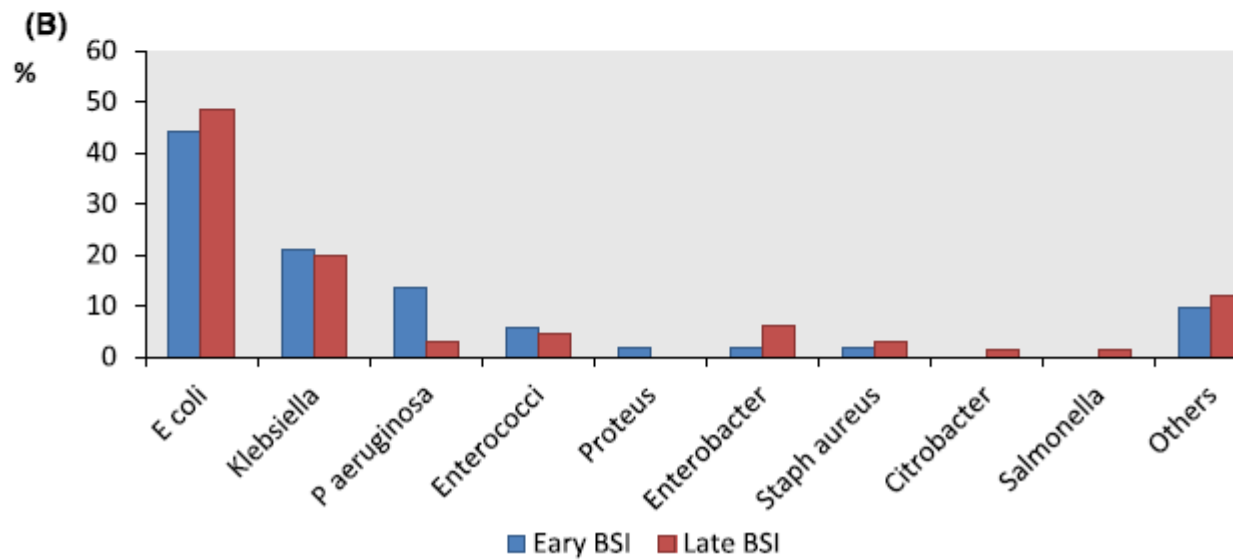
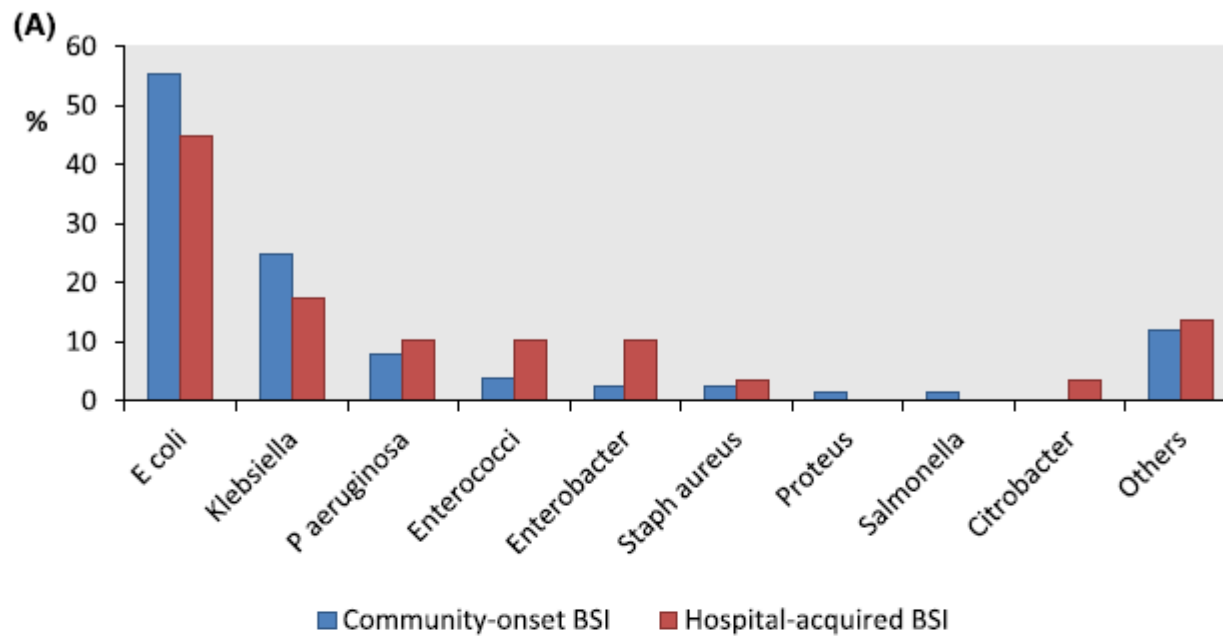
<b>Catheter-related bacteremia</b>	
<i>Staphylococcus</i> coagulase negative <sup>a</sup>	2 (2.4)
<b>Pneumonia and bacteremia</b>	
<i>Streptococcus pneumoniae</i> and <i>Enterococcus</i> sp. <sup>b</sup>	1 (1.2)
<b>Tonsillitis, including one case of peritonsillar abscess and one case of scarlet fever</b>	
<i>Streptococcus</i> group A	8 (9.4)
<b>Cellulitis/abscess</b>	
<i>Staphylococcus aureus</i> - methicillin susceptible	1 (1.2)
<b>Lymphadenitis</b>	
<i>Bartonella henselae</i>	1 (1.2)
<b>Pertussis</b>	
<i>Bordetella pertussis</i>	1 (1.2)
<b>Probable bacterial infections</b>	
Pneumonia	21 (24.7)
Atypical pneumonia	8 (9.4)
Tonsillitis	1 (1.2)
Cellulitis	2 (2.4)
Acute otitis media <sup>b</sup>	2 (2.4)
Infected abdominal collection	1 (1.2)
Infected hematoma	1 (1.2)
Sinusitis	1 (1.2)

<sup>a</sup>Presence of a central venous catheter.

<sup>b</sup>Concomitant influenza virus infection.



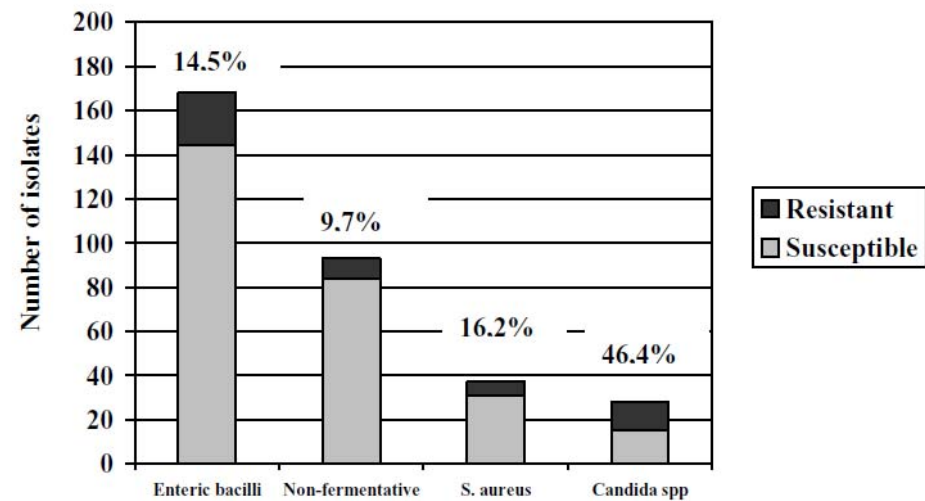




Transplants performed	1400 (48%)
Number of BSI episodes	121
Number of patients	102
Ratio BSI episodes/ patients	1.2
Incidence by episodes	8.6%
Incidence by patients	7.3%
Incidence rate <sup>1</sup>	3.004
Source	
Catheter-related	25/21%
Urinary	47/39%
Pulmonary	1/1%
Biliary	0/ -
Abdominal nonbiliary	2/2%
Surgical wound	5/4%
Unknown	32/26%
Microbiology	
Gram-negative	75/62%
Gram-positive	39/32%
Ratio GP/GN	0.52
Anaerobes	3/2.5%
Fungemia	6/5%
Candidemia	6/5%
Polymicrobial	4/4%
Late onset BI (>6 months)	8 (6.6%)
Candidemia	0
Gram-negative	5 (62.5%)
Gram-positive	3 (37.5%)

	Total	Kidney
CoNS	284 (37%)	27 (22%)
<i>E. coli</i>	127 (17%)	38 (30%)
<i>A. baumannii</i>	60 (8%)	4 (3%)
<i>Pseudomonas</i> spp	47 (6%)	17 (14%)
<i>Enterococcus</i> spp	46 (6%)	6 (5%)
<i>S. aureus</i>	37 (5%)	4 (3%)
<i>Klebsiella</i> spp	29 (4%)	7 (5%)
<i>Candida</i> spp	28 (4%)	6 (5%)
<i>Enterobacter</i> spp	19 (2%)	5 (4%)
<i>Streptococcus viridans</i>	11 (1%)	1 (1%)
<i>Bacteroides</i> spp	9 (1%)	1 (1%)
<i>S. maltophilia</i>	7 (1%)	–
<i>Corynebacterium</i> spp	7 (1%)	1 (1%)
<i>S. pneumoniae</i>	6 (1%)	1 (1%)
Others	51 (6%)	7 (5%)
Total	768	125

CoNS = coagulase-negative staphylococci.



- Pediyatrik renal tx
- Ateşli İYE: 40/110 (%36)

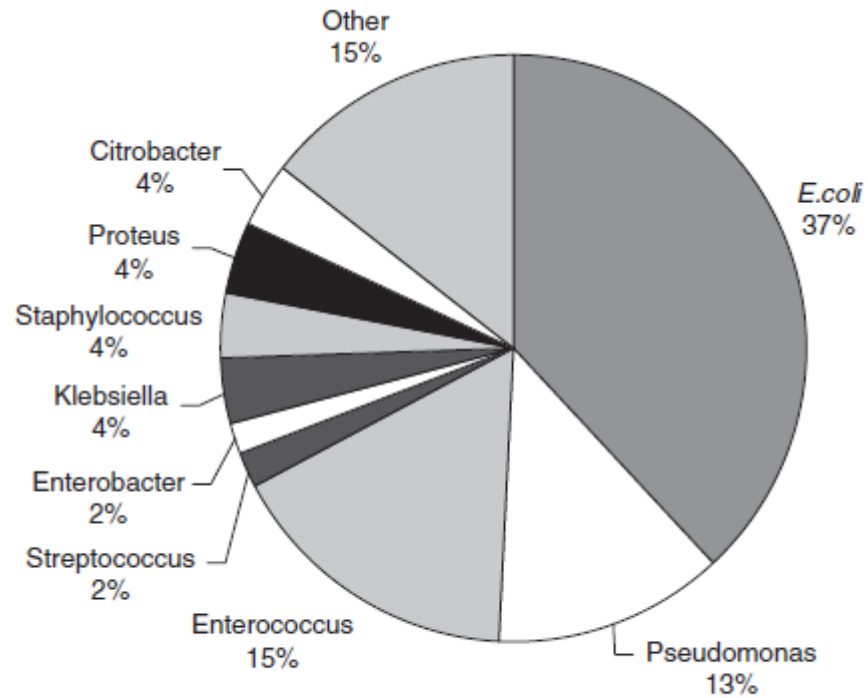


Fig. 1. Relative frequency of bacteria isolated in urinary culture.

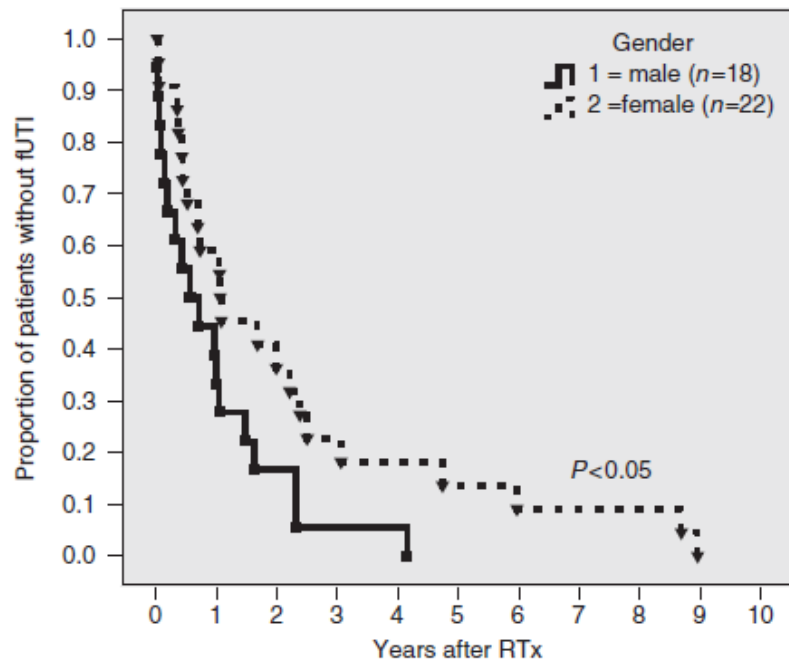


Fig. 3. fUTI in boys occurs significantly earlier than in girls.

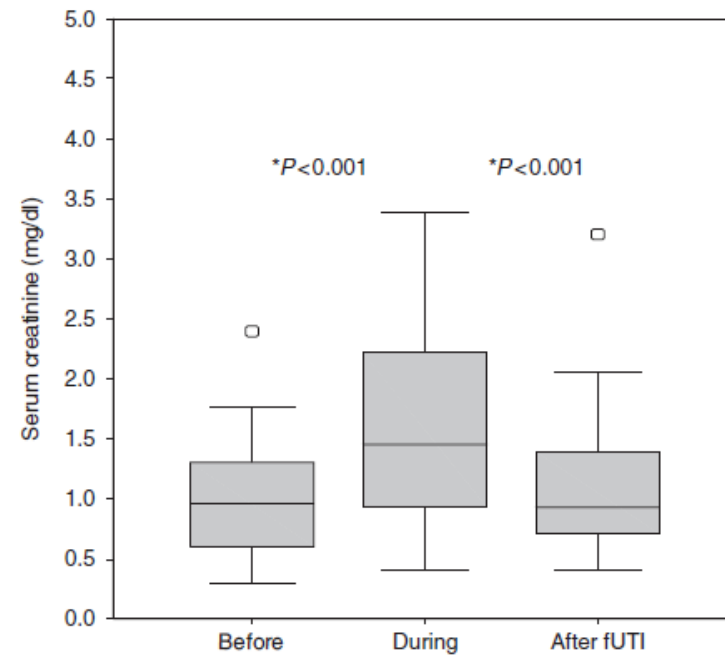
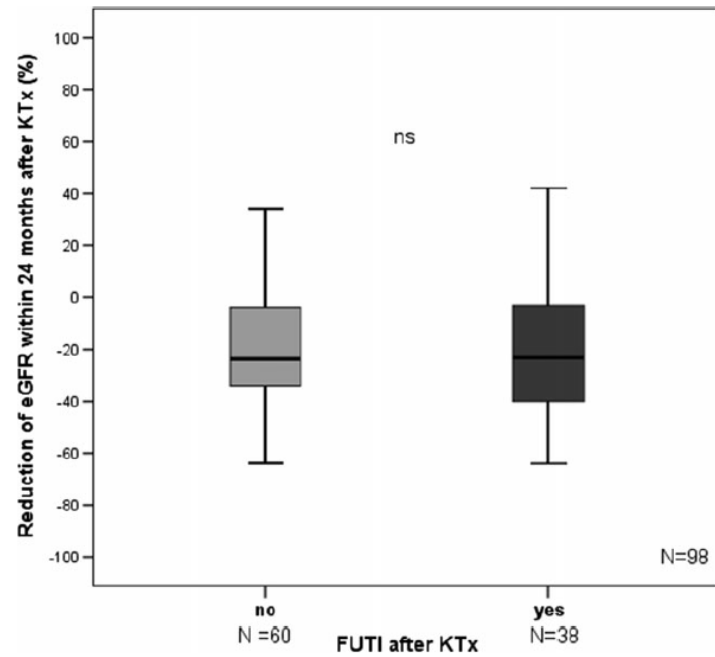
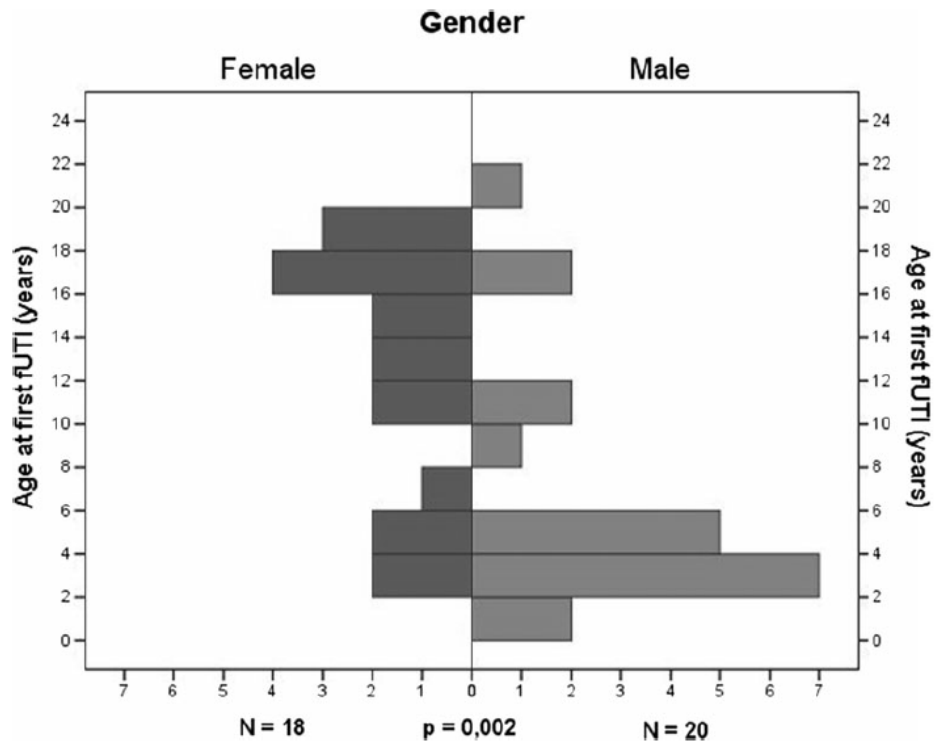
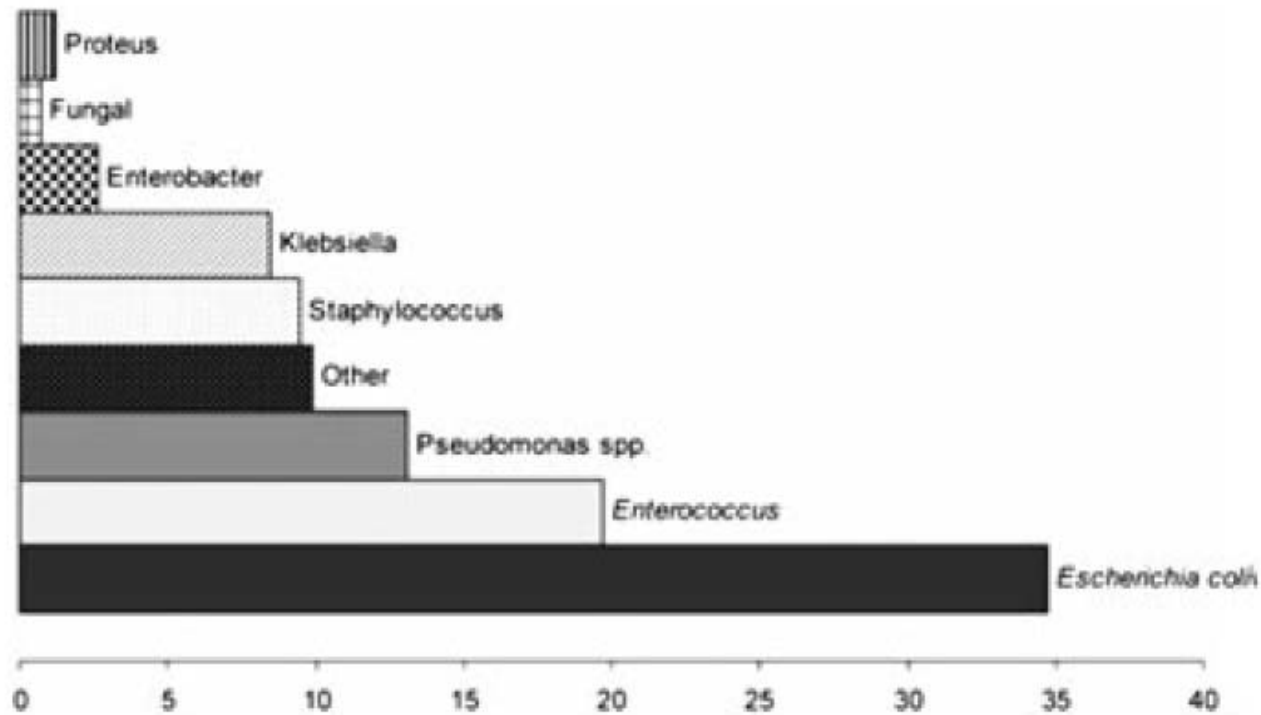


Fig. 2. Renal function during fUTI: Changes in SCr from baseline to time of fUTI and at the next out-patient visit in 40 patients.

- Orta Avrupa
- N=98, pediyatrik renal tx
- %38.7'si ateşli İYE atağı

Primary renal disease	Total	fUTI after KTx	No fUTI after KTx	<i>P</i> value
CAKUT	39 (39.8 %)	19 (48.7 %)	20 (51.3 %)	0.14
VUR	4 (10.3 %)	2 (50.0 %)	2 (50.0 %)	0.60
Renal dysplasia	19 (48.7 %)	6 (31.6 %)	13 (68.4 %)	1.00
Urethral valve	13 (33.3 %)	10 (76.9 %)	3 (23.1 %)	0.004*
Malformation of lower and upper urinary tract	3 (7.7 %)	1 (33.3 %)	2 (66.7 %)	1.00





**Figure 1: Microbiology of urinary tract infections in renal transplant recipients.** Proportion of isolates in each category (N = 1519)



# İYE risk faktörleri

- Pre-tx
  - Üriner sistem anomalisi
  - DM
  - Kız
- Peri-tx
  - Kateter
  - Üreter stenti
  - Teknik komplikasyonlar
  - Kadavra donör
- Post-tx
  - VUR
  - Akut rejeksiyon atakları
  - İS

**Table 3:** Risk factors for UTI in renal transplant recipients (6,15, 26–30)

Risk factors	OR (95% CI)
Bacterial urinary tract infection	
Female gender	5.8 (3.79–8.89)
Age (per year)	0.02 (1.01–1.04)
Reflux kidney disease prior to transplantation	3.0 (1.05–8.31)
Deceased donor	3.64 (1.0–12.7)
Duration of bladder catheterization	1.50 (1.1–1.9)
Length of hospitalization prior to UTI	0.92 (0.88–0.96)
Increase in immunosuppression	17.04 (4.0–71.5)
Candiduria	
Female gender	12.5 (6.70–23.0)
ICU care	8.8 (2.3–35.0)
Prior antibiotic use	3.8 (1.7–8.3)
Indwelling urethral catheter	4.4 (2.1–9.4)
Neurogenic bladder	7.6 (2.1–27)
Malnutrition	2.4 (1.3–4.4)
Acute pyelonephritis	
Female gender	5.14 (1.86–14.20)
Acute rejection episodes	3.84 (1.37–10.79)
Number of UTIs	1.17 (1.06–1.30)
Mycophenolate mofetil	1.9 (1.2–2.3)

# Bakteriyel direnç

- Dirençli m.o. Sayısında artış
  - VRE, MRSA
  - ESBL(+) Klebsiella
  - ESBL(+) Enterobacter
  - Karbapenem dirençli Pseudomonas
  - Karbapenem dirençli Acinetobacter

**Table 2. Frequencies of Pathogens and Their Sensitivity**

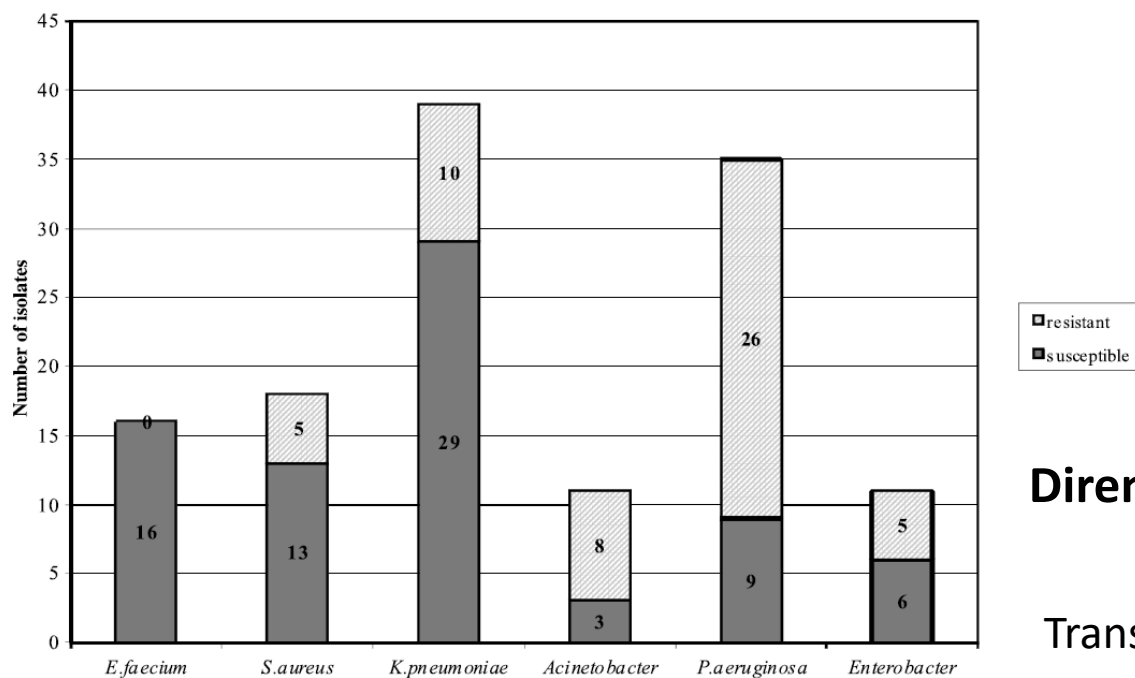
Bacteria	Number (Percentage)	Sensitivity
<i>E. coli</i>	6 (23%)	ESBL producing: 2
<i>Kl. pneum</i>	5 (19%)	ESBL producing: 2
<i>Ps. aerog</i>	3 (11%)	Carbapenem-resist: 1
<i>Staph. epid</i>	3 (11%)	MRSE: 0
<i>Acin. baum</i>	2 (7.7%)	Carbapenem-resist: 1
<i>Enter. faecium</i>	2 (7.7%)	VRE: 2
<i>Salm. spp</i>	1 (3.6%)	Multi-resistant: 0
<i>Prov. bivia</i>	1 (3.6%)	Multi-resistant: 0
<i>Staph. aureus</i>	1 (3.6%)	MRSE: 1
<i>Stenotr. maltoph</i>	1 (3.6%)	Collistine-sensitive: 1
<i>Morg. morganii</i>	1 (3.6%)	Tygecycline-sensitive: 1

Abbreviations: ESBL, Extended Spectrum Beta Lactamase; MRSE, Methicillin-resistant Staphylococcus epidermidis; VRE, Vancomycin-resistant Enterococcus.

**Dirençli bakteri: %27**

**TABLE 2.** Episodes of bacteremia due to rESKAPE pathogens depending on transplantation type and source

	Kidney	Liver	Heart
Vancomycin-resistant <i>E. faecium</i>	0	0	0
MRSA <sup>a</sup>	2	3	0
ESBL-producing <i>K. pneumoniae</i> <sup>b</sup>	7	3	1
Carbapenem-resistant <i>A. baumannii</i> <sup>c</sup>	0	4	2
Carbapenem-resistant and quinolone-resistant <i>P. aeruginosa</i> <sup>d</sup>	13	9	5
Derepression chromosomic b-lactam and ESBL-producing <i>Enterobacter</i> spp. <sup>e</sup>	2	2	1



**Dirençli bakteri: %20**

Transplantation 2013; 96 (9):843

**TABLE 4.** Outcomes of patients with rESKAPE bacteremia comparing with other microorganisms

Variables	rESKAPE pathogens (n=39), n (%)	Other microorganisms (n=185), n (%)	<i>P</i>
Bacteremia persistence <sup>a</sup>	9 (17.3)	17 (7.7)	0.06
Renal impairment <sup>b</sup>	25 (49)	92 (41.6)	0.35
Respiratory insufficiency <sup>c</sup>	17 (33.3)	31 (14)	0.002
Inadequate empirical antibiotic therapy <sup>d</sup>	20 (41)	44 (21.6)	0.01
ICU admission	28 (52)	55 (25.3)	<0.001
Invasive mechanical ventilation	21 (39)	38 (17.2)	0.001
Early case-fatality rate <sup>e</sup>	9 (16.7)	18 (8.1)	0.07
Overall case-fatality rate <sup>f</sup>	19 (35.2)	32 (14.4)	0.001

**Table 1. Analysis of Risk Factors for the Occurrence of ESBL-Producing Enteric Gram-Negative Bacilli UTI**

	ESBL UTI	Non-ESBL UTI	<i>P</i>
Male gender	85.7% (12/14)	61.3% (19/31)	.165
Age (y)	40.7 ± 17.5	39.0 ± 13.3	.723
Diabetes mellitus	28.5% (04/14)	35.5% (11/31)	.743
UTI recurrence	78.5% (11/14)	29.0% (09/31)	.003
Reoperation	50.0% (07/14)	12.9% (04/31)	.020
Urinary tract obstruction	42.8% (06/14)	19.3% (6/31)	.147
Acute rejection	7.1% (01/14)	3.2% (01/31)	.530
Induction protocol	0% (0/14)	6.4% (02/31)	.98
High immunosuppressant levels	35.7% (05/14)	29.0% (09/31)	.734
Use of tacrolimus + MMF	64.3% (09/14)	32.2% (10/31)	.057

*Abbreviations:* UTI, urinary tract infection; ESBL, extended-spectrum  $\beta$ -lactamase; MMF, mycophenolate mofetil.

# Ateşli tx hastada lab.

- Hemogram, CRP, PCT
- Kan kültürü
  - >1, perifer
  - Varsa kateterden
- İdrar tetkiki ve kültürü
- Akc.grafisi
- Sol. sisteminden örnek, kültür, viral tarama
- Enf. yerine göre özel testler
  - CMV PCR
  - Abse, BOS
- IgG ve diğer Ig'ler



- 1995-2007, pediatrik renal tx
- N=101, 251 ateş atağı
- Kan kültürü (+): %10
  - 2/3'ünde kateter vb cihaz
- İdrar kültürü (+): %27
- GD iyi, kateteri yoksa bakteremi yok

**TABLE 3.** Odds Ratios for Bactermia in Febrile Outpatient Pediatric Kidney Tansplant Recipients

	Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Time since transplant		
Early* (first quartile) (<1 mo)	2.3 (0.7–7.6) 2.7 (0.6–12.6)	
Late* (Fourth quartile) (>6 mo)	0.4 (0.1–1.9) 2.9 (0.9–9.1)	
Presence of indwelling hardware	10.1 (3.7–27.5)	11.4 (4.4–29.5)
Presence of focal infection	2.6 (1.0–6.9)	3.3 (1.1–9.8)
Current use of prednisone	0.9 (0.3–2.5)	
Current use of tacrolimus <sup>†</sup>	0.8 (0.2–2.5)	

**Table 2** Rate of positive blood culture results and bacteria isolated from patients, based on infection.

Infection source	Positivity rate, n/N (%)	Bacteria
Urinary tract infection	2/36 (5.6)	<i>Escherichia coli</i>
Upper respiratory tract infection	0/35 (0)	
Pneumonia	1/20 (5.0)	<i>Streptococcus pneumoniae</i> (PSSP)
Enteritis	1/14 (7.1)	<i>E. coli</i>
Meningitis	1/2 (50)	<i>Streptococcus</i> spp.
Cellulitis	0/3 (0)	
Other/unknown	2/26 (7.7)	<i>Staphylococcus aureus</i> (MSSA), <i>Streptococcus agalactiae</i> (Group B)
<b>Toplam</b>	<b>7 (%5)</b>	

**Table 3** Clinical characteristics of patients with positive and negative blood culture results.

Variable	Positive (n = 7)	Negative (n = 129)	<i>p</i>
Age when examining blood cultures	46.6 (18.0)	44.0 (19.7)	0.737
Sex (M/F)	5/2	82/47	>0.99
Duration from KTx to BCs (mo)	129 (58–161)	77 (2–370)	0.224
Steroid withdrawal	1	9	0.422
Tacrolimus/cyclosporine	2/5	63/54	0.256
MMF/mizoribine/ azathioprine	2/3/2	41/49/27	>0.99
White blood cell (count/ $\mu$ L)	19947 (6526)	12392 (6358)	0.003
C-reactive protein (mg/L)	228.8 (12.3–442.1)	37.7 (0–394.7)	0.004

**Table 4** Distribution of bacteremia stratified by the combination of the white blood cell count and C-reactive protein level.

	WBC count <15,800/ $\mu$ L n/N (%)	WBC count $\geq$ 15,800/ $\mu$ L n/N (%)	
CRP <125 mg/L	1/87 (1.1)	0/23 (0)	110
CRP $\geq$ 125 mg/L	0/9 (0)	6/17 (35.3)	26
	96	40	

**TABLE 2.** White Blood Cell Indices of Febrile Outpatient Pediatric Kidney Transplant Recipients

	Bacteremic Patients (CI) (N)	Nonbacteremic Patients (CI) (N)	<i>P</i>
Mean* white blood cell count (WBC)	15.3 <sup>†</sup> (4.2–11.6) (21)	9.7 <sup>†</sup> (8.6–10.8) (184)	0.004
Mean* absolute neutrophil count (ANC)	12.8 <sup>†</sup> (10.1–15.5) (21)	8.0 <sup>†</sup> (7.1–8.9) (184)	0.004
Mean* absolute band count (ABC)	2.1 <sup>†</sup> (1.0–4.5) (20)	1.1 <sup>†</sup> (0.8–1.3) (183)	0.27
Mean* band-to-neutrophil ratio (BNR)	0.29 (0.15–0.53) (20)	0.19 (0.15–0.24) (183)	0.90

**TABLE 5** Risk factors for bacterial infectious morbidity in febrile children post-renal transplantation<sup>a</sup>

Variable	Bacterial infection		P value
	Yes n=80	No n=77	
Age on admission (mean ± SD) (y)	10.2 ± 5	8.3 ± 4.8	.021
Presence of central venous catheter, N (%)	4 (2.5%)	0 (0%)	.025
Sonographic findings compatible with infection <sup>b</sup>	18 (58.0%)	2 (11.7%)	<.001
Laboratory variables on admission (mean ± SD)			
CRP (mg/L)	80.2 ± 9	40.8 ± 5	.004
WBCs (×10 <sup>9</sup> /L)	13.2 ± 7	9.6 ± 5	.001
ANC (×10 <sup>9</sup> /L)	10.2 ± 6	6.5 ± 4	.001

**TABLE 6** Performance of biomarkers in identifying bacterial infection in febrile episodes of renal transplant recipients

	Sensitivity	Specificity	PPV	NPV	AUC
CRP					
≥5 mg/L	92.9% (85.4%-96.7%)	15.5% (8.9%-25.7%)	56.8% (53.9%-59.7%)	64.7% (42.3%-82.1%)	54.2% (49.2%-59.2%)
≥20 mg/L	71.8% (61.4%-80.2%)	53.5% (42.0%-64.6%)	65.0% (58.2%-71.0%)	61.3% (51.5%-70.3%)	62.6% (55.1%-70.2%)
≥50 mg/L	50.6% (40.2%-61.0%)	64.8% (53.2%-74.9%)	63.2% (54.1%-71.5%)	52.3% (45.4%-59.1%)	57.7% (50.0%-65.4%)
WBCs					
≥15×10 <sup>9</sup> /L	31.8% (22.8%-42.3%)	87.3% (77.6%-93.2%)	75.0% (60.5%-85.5%)	51.7% (47.48%-55.9%)	59.5% (53.3%-65.8%)
ANC					
≥10×10 <sup>9</sup> /L	42.4% (32.4%-53.0%)	81.7% (71.2%-89.0%)	73.5% (61.7%-82.7%)	54.2% (48.9%-59.5%)	62.0% (55.1%-68.9%)

Values are given as % (95% CI); AUC, area under the curve; CRP, C-reactive protein; WBCs, white blood cells; ANC, absolute neutrophil count; PPV, positive predictive value; NPV, negative predictive value.

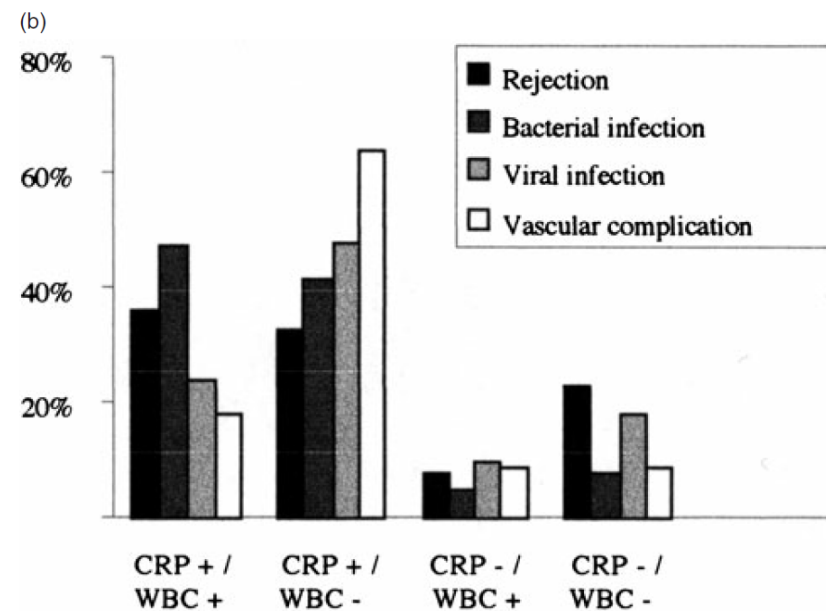
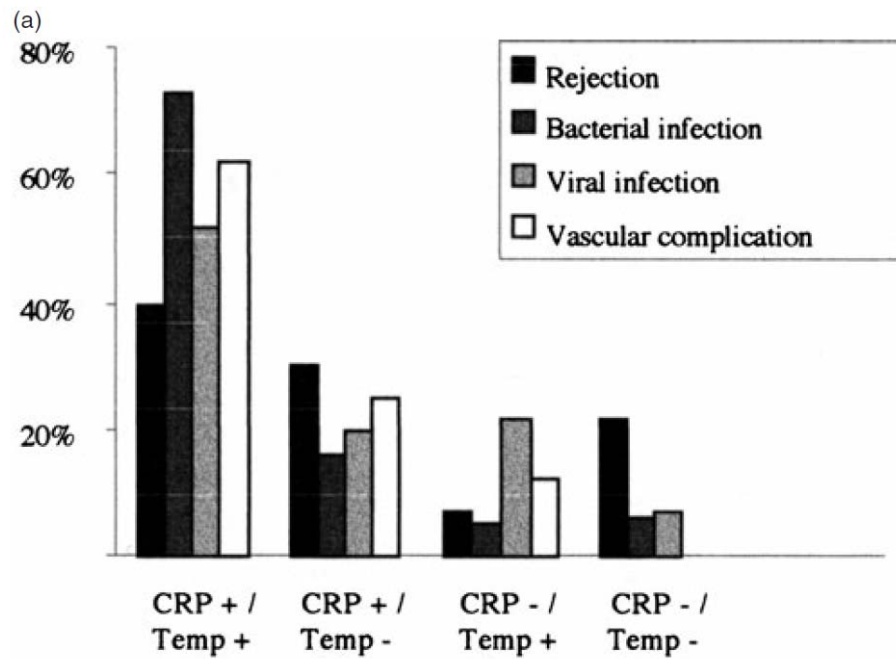


Table 3. Sensitivity, specificity, and predictive values for C-reactive protein (CRP) in different complications

	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Rejection	0.69	0.96	0.33	0.99
Bacterial infection	0.88	0.95	0.26	0.99
Viral infection	0.73	0.95	0.16	0.99
Vascular complication	0.82	0.94	0.04	0.99

# Prokalsitonin

- A.rejeksiyonlu olgularda N
- Bakteryel enf ↑

Bakteryel enf.	Spesivite	Sensitivite
CRP	0.43	1.0
PCT	0.7	0.87

Clin Transplant 1998;12(3):206-11

- N=102 (55 HD, 47 renal tx)

Parameter	Confirmed infection (n = 34)	Without confirmed infection (n = 68)	P-value
Age [years]	10.41 ±4.21	11.09 ±3.59	0.40
Gender (M/F)	7/9	17/18	0.90
BMI [kg/m <sup>2</sup> ]	20.89 ±6.04	22.33 ±7.98	0.57
Renal replacement (dialysis, %)	16 (47.01%)	40 (57.97%)	0.04
Erythropoietin requirement [IU/W]	3695.7 ±1240.78	4512.5 ±1795.61	0.05
SBP [mmHg]	111.88 ±12.03	116.80 ±15.11	0.11
DBP [mm Hg]	73.44 ±9.02	74.26 ±10.08	0.69
Albumin [g/dl]	3.68 ±0.64	3.74 ±0.46	0.62
Hemoglobin [g/dl]	10.55 ±2.04	10.50 ±1.50	0.89
WBC [×10 <sup>3</sup> /mm <sup>-3</sup> ]	7.16 ±2.76	6.83 ±2.49	0.55
PCT [ng/ml]	0.920 ±0.24	0.456 ±0.53	0.04



PCT	Sensitivity (%)			Specificity (%)			Positive predictive value (%)			Negative predictive value (%)		
	All	D	RTx	All	D	RTx	All	D	RTx	All	D	RTx
> 0.5 ng/ml	94.1	80	94.1	87.9	14.3	96.8	52.8	86.1	50.3	47.8	14.9	50.2
> 0.75 pg/ml	82.4	73.3	76.5	66.7	2.9	74.2	56.4	97.5	51.9	44.3	0.04	48.8

Parameter	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
PCT > 0.5 ng/ml	90.6	40	70.6	30.2
PCT > 0.75 pg/ml	81.2	17.5	83.5	17.5
Hs-CRP > 3 mg/l	78.1	25	77.1	23.9

# Ampirik Antibiyotik seçimi

- Lokal epidemiyoloji
- Prof. ab kullanımı
- Klinik durumun ciddiyeti
- Post-tx periyod (erken-geç dönem)
  
- Aminoglikozidler, kolistin gibi nefrotoksik ajanların kullanımı gerekebilir.

# Mortalite

**TABLE 4.** Independent risk factors for 30-day mortality in solid organ transplant recipients with bloodstream infection

Variables	OR (95% CI)	p
Septic shock at presentation <sup>a</sup>	13.658 (5.985–31.168)	<0.001
Acute graft rejection within the preceding 6 months	3.681 (1.059–12.795)	0.040
Platelet count of <50 000/mm <sup>3</sup>	3.070 (1.173–8.038)	0.022
Kidney recipients	0.375 (0.156–0.900)	0.028

<sup>a</sup>Septic shock was defined as sepsis-induced hypotension persisting despite adequate fluid resuscitation.

**TABLE 3. Causative pathogens isolated in each episode of bloodstream infection (BSI) according to 30-day mortality**

Causative organisms	Survivors (N = 320)	Non-survivors (N = 41)	p
Monomicrobial BSI, n (%)	282 (88.1)	35 (85.4)	0.612
Gram-positive bacteria	69 (24.5)	13 (37.1)	0.106
CNS	18 (6.4)	5 (14.3)	0.155
MSSA	15 (5.3)	0	0.388
MRSA	3 (1.1)	1 (2.9)	0.375
<i>Enterococcus faecalis</i>	12 (4.3)	2 (5.7)	0.659
<i>Enterococcus faecium</i>	8 (2.8)	3 (8.6)	0.110
<i>Streptococcus pneumoniae</i>	7 (2.5)	1 (2.9)	1
<i>Listeria monocytogenes</i>	3 (1.1)	0	1
Other	3 (1.1)	1 (2.9)	0.375
GNB	209 (74.1)	19 (54.3)	0.014
<i>Escherichia coli</i>	99 (35.1)	6 (17.1)	0.033
<i>Klebsiella pneumoniae</i>	47 (16.7)	1 (2.9)	0.057
<i>Enterobacter</i> species	13 (4.6)	0	0.375
<i>Serratia marcescens</i>	3 (1.1)	0	1
<i>Morganella morganii</i>	3 (1.1)	0	1
<i>Salmonella enteritidis</i>	2 (0.7)	0	1
<i>Pseudomonas aeruginosa</i>	27 (9.6)	8 (22.9)	0.039
<i>Acinetobacter baumannii</i>	3 (1.1)	1 (2.9)	0.375
<i>Stenotrophomonas maltophilia</i>	0	1 (2.9)	0.110
Other GNB	5 (1.8)	1 (2.9)	0.507
<i>Bacteroides fragilis</i>	3 (1.1)	1 (2.9)	0.445
Other	3 (1.1)	0	1
MDR Gram-negative bacilli	67 (23.8)	9 (25.7)	0.798
ESBL-producing <i>Enterobacteriaceae</i>	32 (11.3)	2 (5.7)	0.584
Carbapenem-resistant GNB	25 (8.9)	8 (22.9)	0.018
Yeast	4 (1.4)	3 (8.6)	0.032
<i>Candida albicans</i>	4 (1.4)	0	1
<i>Candida non-albicans</i>	0	3 (8.6)	<0.001
Polymicrobial, n (%)	38 (11.9)	6 (14.6)	0.612

CNS, coagulase-negative staphylococci; ESBL, extended-spectrum  $\beta$ -lactamase; GNB, Gram-negative bacilli; MDR, multidrug-resistant; MRSA, methicillin-resistant *Staphylococcus aureus*; MSSA, methicillin-sensitive *Staphylococcus aureus*.

**Table 5:** Risk factors for mortality in SOT recipients with BIs

	OR
One-year age increment	1.00
Male gender	0.55
Type of SOT	
Liver	3.15
Kidney	0.34
Pancreas	1.13
Heart	0.27
Lung	1.20
Immunosuppressive regimen	
Tacrolimus-based	0.84
Cyclosporin-based	1.04
Use of mofetil mycophenolate	0.55
CMV infection/disease <sup>1</sup>	0.19
Acute rejection <sup>1</sup>	0.22
Surgical reoperation <sup>1</sup>	1.29
BI after 6 months posttransplant	1.64
Source	0.63
Catheter-related	0.32
Urinary	7.00
Pulmonary	1.66
Abdominal <sup>2</sup>	0.96
Unknown	1.94
Gram-negative BI	0.54
Gram-positive BI	0.53
Candidemia	3.40
Leukopenia	45.3
Septic shock	5.60
Renal failure	26.8
Respiratory failure	33.0
Need for mechanical ventilation	

# AKDENİZ ÜTF DENEYİMİ

- 1.12.2017-30.11.2018 tarihleri arasında
- Hastaneye yatış
- Toplam 65 tx hastası, 146 yatış

Yatış nedeni	n
Greft disfonksiyonu	52 (35.6%)
İYE	4
ÜSYE-ASYE	2
CMV	1
<b>Ateş</b>	<b>36 (24.7%)</b>
Enfeksiyon bulguları (ateşsiz)	22 (15.1%)
GİS enf.	9
ÜSYE-ASYE	9
Suçiçeği-zona	3
İYE	1
Diğer	36 (24.7%)
Toplam	146

<b>Ateş nedeni</b>	<b>N</b>
İYE	15 (41.7%)
ÜSYE-ASYE	11 (30.6%)
GİS enf.	3 (8.3%)
CMV	1
Belirsiz	6
<b>Toplam</b>	<b>36</b>
Ort.yatış süresi	9 gün



<b>Enfeksiyon nedeni</b>	<b>N</b>
İYE	20 (32.3%)
ÜSYE-ASYE	22 (35.5%)
GİS enf.	12 (19.4%)
CMV	2
Belirsiz	6
<b>Toplam</b>	<b>62</b>

<b>İYE etkeni</b>	<b>ESBL (+)</b>	<b>Toplam</b>
E.coli	5 (55.6%)	9 (45%)
Enterobacter	2 (40%)	5 (25%)
Klebsiella	4 (100%)	4 (20%)
Pseudomonas	0	1 (5%)
Belirsiz	0	1
<b>Toplam</b>	<b>11 (55%)</b>	<b>20</b>

2'si stent-ilişkili

1: stent çekimi sonrası

1: sting operasyonu sonrası

# Olgu 1

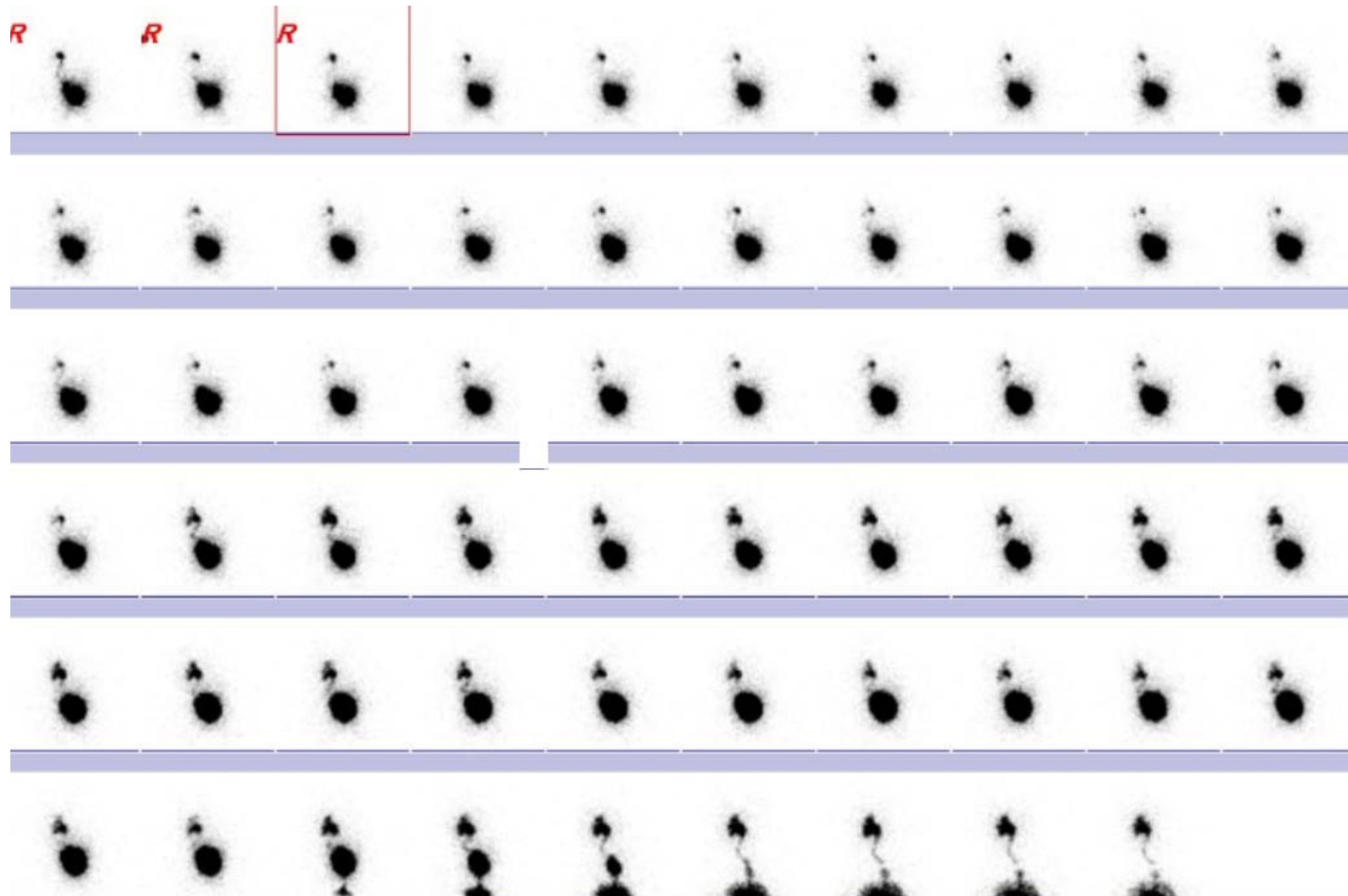
- C.D., 7 yaş, K
- Primer: FSGS (podosin +)
- HD, 3 aydır.
- Verici: Baba (HLA mismatch: 3)
- EBV +, CMV +
- Tx tarihi: 24.09.2014

- Post-tx 12.ay
- Ateş, kusma, başağrısı
- 1 saat sonra ÇAP başvurusu
- VS:38.6<sup>0</sup>C, TA:102/52 mmHg, N:163/dk, SS:32/dk
- FM: Ateş odağı yok.
- BK: 13.800/mm<sup>3</sup> (PNL %67), CRP: 0.66 mg/dL (>0.5), PCT: 0.21 ng/mL(<0.1)
- Ertesi gün: CRP: 10.8 mg/dL, PCT: 58.3 ng/mL
- TİT: 5/1009, LE eser, nitrit 2+, 19 lökosit

- İnfluenza, parainf, RSV, rinovirus PCR -
- Akc gr N
- Hipotansiyon: Dopamin, adrenalin
- ÇYBÜ yatış
- Vankomisin + Meropenem
- İdrar kültürü: E.coli 10bin CFU
- US: Tx bb ekosu grade1 ↑, hidronefroz (renal pelvis AP çapı 11 mm)

- Post-tx 30.ay
- Ateş, kusma
- VS:38.4<sup>0</sup>C, TA:123/73 mmHg, N:157/dk, SS:24/dk
- FM: Ateş odağı yok.
- BK: 20.800/mm<sup>3</sup> (PNL %61), CRP: 0.56 mg/dL (>0.5), PCT: 0.08 (<0.1)
- Ertesi gün: CRP: 15.3 mg/dL, PCT: 0.29 ng/mL
- TİT: 5.5/1014, LE eser, nitrit -, 8 lökosit

- Meropenem
- İdrar kültürü: Klebsiella pneumonia 100bin CFU
- US: Tx bb hidronefroz (renal pelvis AP çapı 18 mm), üreter proksimali geniş
- VUR sint







- IgG: 586 mg/dL (<700)
- IgG2: 121 mg/dL (<169)
- IVIG verildi
- İmmünoloji görüşü ile 3 haftada bir IVIG alması önerildi.

- Üroloji
- Subüreterik enjeksiyon
- 3 ay sonraki sint: VUR devam
- Tekrar subüreterik enjeksiyon
- VCUG: VUR (üroloji)
- Sonrasında İYE yok, yatış gerektiren enf yok.

# Primer hastalığa göre İYE sıklığı

	non-LUTD	LUTD	p	PUV	VUR nephropath y	Neurogenic bladder	p
6 <sup>th</sup> month UTI rate (%)	10.8	24.6	0.037	8.3	20.8	77.8	0.000
Between 6-12 months UTI rate (%)	8.2	24.6	0.01	16	16.7	66.7	0.000

# Post-tx VUR

- 2005-2014 yılları arası
- N=133
- Post-tx VUR: 23 (%17,2)
- Post-transplant ilk 6 ayda ateşli İYE: %54
- Post-transplant 6-12 ayda ateşli İYE: %68
- Tedavi
  - Subüreterik enjeksiyon: 15
  - üreteroneosistostomi : 5
- Prognoz
  - Greft kaybı: 1

## Olgu 2

- İFS, 15 yaş, E
- Primer hst: PUV, sol renal agenezis
- PD – 10 aydır
- Verici: Anne (HLA mismatch: 3)
- EBV -, CMV +
- Tx tarihi: 21.10.2015

- Post-tx 6.ayda ateş ile yatış, sinüzit
- 10.ayda GIS enf ile yatış

- Post-tx 3.yıl
- 1 haftadır olan ateş ve öksürük ile başvuru
  - Tonsillit – oral ab
  - Ateş devam - pnömoni – yatış önerisi
- VS: 39<sup>0</sup>C, SS: 24/dk
- FM: Bilateral ince ral (solda daha belirgin)





- Hb: 11.5 g/dL
- BK: 8800/mm<sup>3</sup> (%77 PNL)
- Plt: 171.000/mm<sup>3</sup>
- CRP: 23.1 mg/dL (>0.5)
- PCT: 16.9 ng/mL (>0.1)

- Tdv: Piperasilin-tazobaktam + klaritromisin (2.gün)
- IgG ve IgM ↓ → IVIG
- İS dozları ↓

- 3.günde ateş devam, takipne, hipoksemi
- BK: 2500/mm<sup>3</sup>, Plt: 93.000mm<sup>3</sup>
- CRP: 24.6 mg/dL (>0.5), PCT: 58 ng/mL (>0.1)



- Vankomisin + TMP-SMX (yüksek doz)
- İS stop
- YBÜ devir
- Antifungal ted (kaspofungin)
- Kan kültürü: Steril

- Trakeal aspirat kültürü (16.gün): *Acinetobacter baumannii* (sadece kolistine hassas)
- Yatışının 16.gününde exitus

# OLGU 3

- O.K., 10 yaş, E
- Primer: Sistinozis
- Verici: Anne (HLA mismatch: 2)
- Pre-emptif
- EBV – (donör +), CMV
- Tx tarihi: 26.06.2008

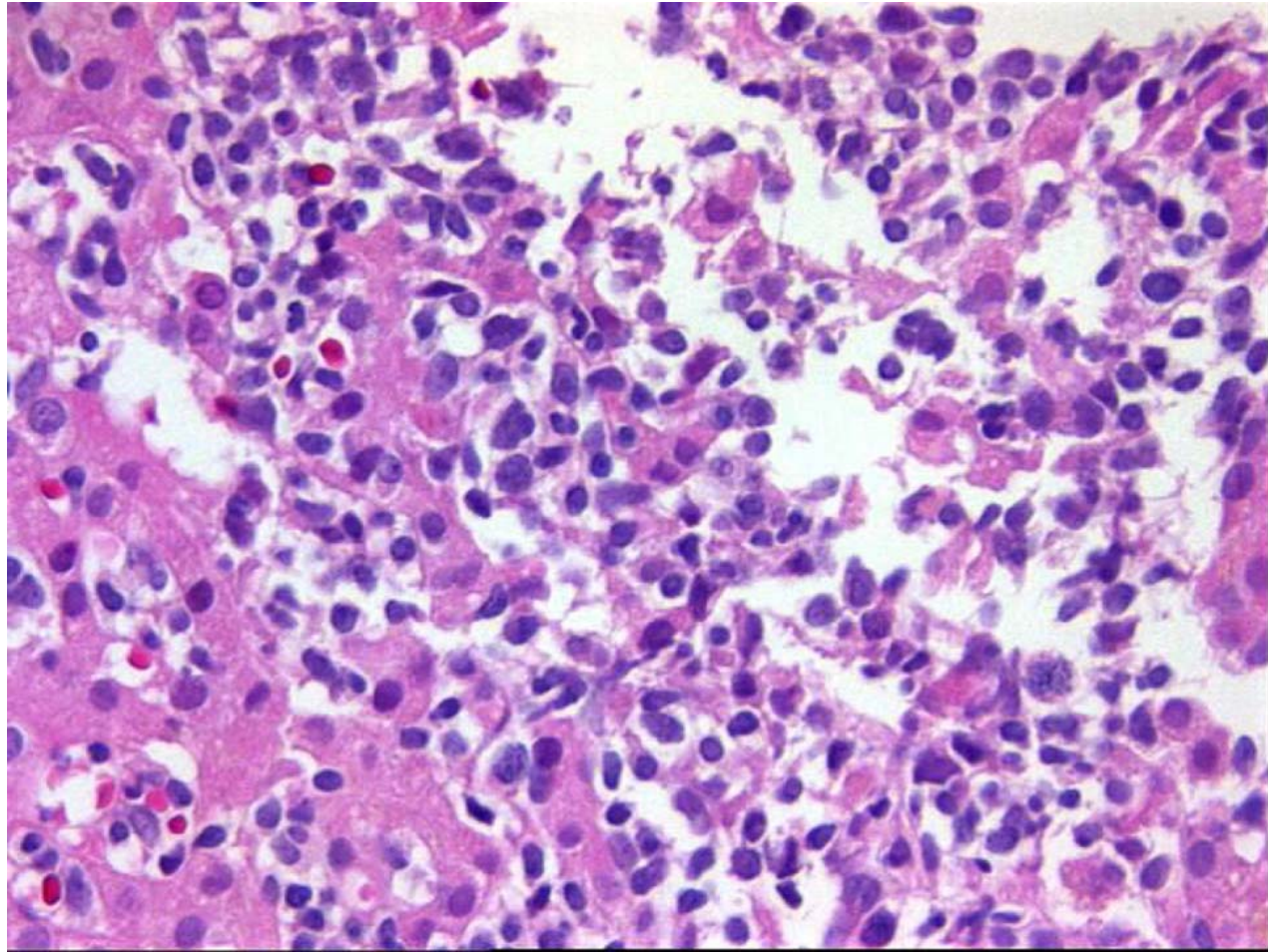


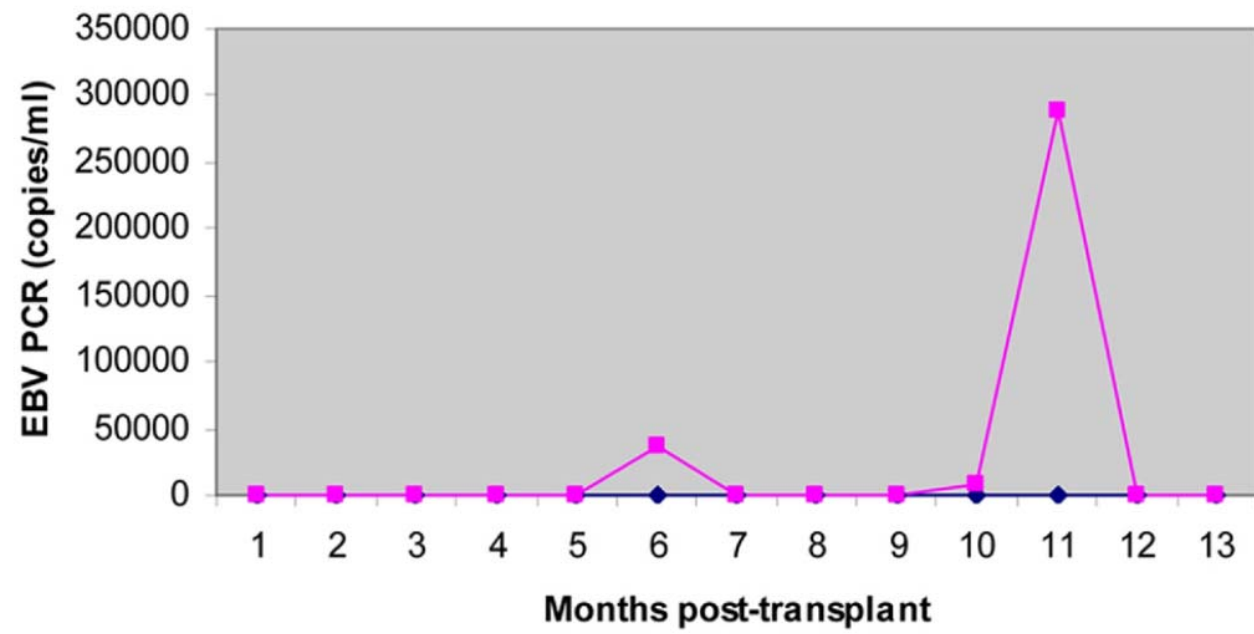
- Post-tx 5.5 ay
- Ateş ve boğaz ağrısı
- FM: Membranöz tonsillit, HSM
- Hb: 10, BK: 4900/mm<sup>3</sup> (PNL %18, lenfo %45, %33 monosit), CRP 1.4 mg/dL
- Boğaz k: N
- Kan k: steril
- EBV IgM +, EBV PCR: 5528 kopya/mL

- 2 ay sonra (post-tx 8.ay)
- Halsizlik, kilo kaybı (1 ayda 2 kg)
- Abd. US:
- EBV PCR: 289.242 kopya/mL

#### KARACİĞER:

Parankim-Ekoşu:	İnce granüler yapıda,
Boyutları (long: aksta sağ lob):	~ 126 mm ( N : 70-128 mm ) ( üst sınırdadır )
Konturları:	Normal
Intrabepatik Safra Yolları:	Normal
Koledok:	Normal
Vasküler Yapılar:	Portal ven çapı ~ 14 mm ( artmış )
Fokal Lezyon:	Sol kilita ~ 37x26x20 mm boyutunda hipoekoik, düzgün konturlu Doppler incelemesinde içersimide vasküler sinyal alınmayan nodüler görünüm izlendi.





↑  
Primary  
infection

↑  
PTLD

# Çocuk böbrek naklinde 30.yıl kutlamamız

