

# A Mysterious and Tenacious Bug



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# Case Report 1



- A 3-year old, male child was brought to the EM with accidental history of electric burns over the upper body, scalp and small areas of the buttocks.
- Patient presented to the EM around 1 hour after the injury.
- On examination: 27% electrical burns, with Second and Third degree burns, associated with loss of sensation over face, chest, back, both upper limbs, waist, buttocks and left thigh.

# On Examination



- Conscious, irritable
  - Pulse: 140bpm
  - BP: 124/80 mm Hg
  - RR: 28/min
  - spO<sub>2</sub>: 98% on room air
  - Peripheral pulses: feeble
  - CVS,CNS- WNL
  - PA- soft, non tender
  - RS: WNL

# Lab Investigations

- **CBC**

- Hb: 14.70 g/dl
- TLC: 11500/ $\mu$ L
- Platelet count: 251000/ $\mu$ L

- **Differential Count**

- Neutrophils: 85%
- Eosinophils: 0
- Lymphocytes: 11%
- Monocytes: 4 %

- Urea – 40mg/dL
- Creatinine - 1.29mg/dL
- CRP- 1mg/dl
- Na - 132 mmol/L
- K - 5.60 mmol/L

- Wound swab culture: No growth
- Urine culture: No growth
- Blood culture: No growth



Patient was admitted to Burns ICU under the Department of Pediatrics and Plastic Surgery.

- Inj. Ceftriaxone was given on admission.
- Routine lab investigations were followed and patient was started on treatment.
- Patient was NPO for 48 hrs and started on IV fluids.
- Pt was started on antibiotics:
  - Inj Amoxicillin/Clavulanic Acid
  - Inj Amikacin
- Inj Paracetamol
- Inj Tetanus Toxoid 0.5ml IM stat
- Patient was catheterised and urine output was monitored.



- Day 3 of ICU stay: **WBC count: 31,500/ $\mu$ L**
  - Patient had 1 episode of fever in the morning.
  - He was irritable and his urine output was low.
  - Inj Amoxicillin/Clavulanic Acid was stopped and patient was started on Inj Ceftriaxone.
  - Blood and Urine were sent for culture/sensitivity.

- Blood culture/sensitivity : No growth
- Urine culture/sensitivity : No growth

- Day 4, 5 and 6: Patient had multiple fever spikes and CRP levels were raised.

**CRP: 160mg/dL**

- Day 6:
  - Inj. Ceftriaxone and Inj Amikacin were stopped and patient was started Inj. Meropenem and Inj. Teicoplanin.
  - Fever spikes did not subside.

DAY OF ICU STAY	TLC
Day 7	7300/ $\mu$ L
Day 8	12900/ $\mu$ L
Day 9	20800/ $\mu$ L
Day 10	24100/ $\mu$ L



- Day 7:
  - Antibiotics were continued but the patient had continuous fever spikes in the morning (100.2°F-100.6°F).
  - His fever spikes remained persistent in the evening.

WBC Count: 13,900/ $\mu$ L

- Day 8:
  - Patient had continuous fever spikes in the morning and afternoon.
  - H/O pus discharge over the left shoulder; discharge was collected in a swab and was sent for culture/sensitivity.

Procalcitonin: 6.72ng/mL  
 CRP: 160mg/L  
 TLC: 21300/ $\mu$ L  
 Neutrophil: 86%

Pus culture/sensitivity: *Acinetobacter* spp. grown

- Day 9:
  - Patient had 2 episode of fever in the morning (101.7°F;100.2°F).
  - 3 fever spikes in evening (100.7°F;100.6°F; 103.3°F).
  - Dose of Meropenem and Teicoplanin were increased.

- Day 10:
  - Patient had continuous fever spikes (highest: 103°F).
  - Antibiotic dose were further upgraded.

- Day 11:
  - Patient had 2 episodes of high grade fever (101.9°F;104.1°F).
  - Antibiotics were continued.



WBC Count: 20,800/ $\mu$ L  
Neutrophil: 56%

- Day 12:
  - Patient had 3 fever spikes for which IV Paracetamol infusion was given.
- Day 13:
  - Patient had 4 fever spikes in the morning and continuous high grade fever in the afternoon.
  - Blood was sent for culture/sensitivity before the next dose .
  - Antibiotics were continued.
  - Pseudoeshcar over burn site on the back.
  - Pus was aspirated from the site and tissue was collected, which were sent for culture and sensitivity.
- Day 14:
  - Multiple fever spikes
  - Antibiotics were continued and Paracetamol infusion was given.

**Blood c/s : YEAST grown and further identification was followed.**



## Pus and Tissue culture/sensitivity:

- *Pseudomonas aeruginosa* isolated
- Resistant to all drugs

- Day 15:
  - Patient had multiple episodes of high grade fever.
  - Inj. Meropenem and Inj Teicoplanin was stopped.
  - Inj Fluconazole was started along with Inj Colistin.
- Day 16:
  - Patient was afebrile in the morning, followed by 1 fever spike in the evening.
  - Antibiotics were continued.

WBC Count: 24,100/ $\mu$ L

### Fluid Culture Report

Test : Isolation & Antimicrobial susceptibility of aerobic organisms.

Method : Manual culture / ID & AST by Vitek 2 Automated System.

Specimen : Tissue :

ZN Stain : No acid fast bacilli seen.

Organism : *Pseudomonas aeruginosa*.

Antimicrobial susceptibility	MIC ( $\mu$ g/ml)	Interpretation
Aztreonam	-	Resistant
Cefepime	32	Resistant
Cefoperazone/sulbactam	-	Resistant
Ceftazidime	-	Resistant
Ceftazidime/Avibactam	16	Resistant
Ceftolozane/Tazobactam	32	Resistant
Ciprofloxacin	-	Resistant
Colistin	1	Intermediate
Imipenem	-	Resistant
Levofloxacin	8	Resistant
Meropenem	8	Resistant
Netilmicin	32	Resistant
Piperacillin	-	Resistant
Piperacillin/Tazobactam	-	Resistant
Polymyxin B	1	Intermediate
Tobramycin	16	Resistant

Comment : (Gram stain-gram negative bacilli seen), Carbapenemase Producer.

*Pseudomonas aeruginosa* is intrinsically resistant to Ampicillin, Amoxicillin/Clavulanic acid, Cefotaxime, Ceftriaxone, Tigecycline, Chloramphenicol & Co-Trimoxazole. Kindly correlate clinically.

## Final Identification: *Candida auris* isolated

- Day 17:
  - Patient had 1 low grade fever spike in the morning
  - Multiple high grade fever spikes in the evening.
  - Syp. Linezolid was added to the regime.
- Day 18:
  - H/O 3 fever episodes.
  - Antibiotics were continued.
  - *Candida auris* reported.
  - Inj. Fluconazole was stopped and Inj Caspofungin was started along with Inj Colistin and Syp. Linezolid.

### Blood Culture Report

Test : Isolation & Antimicrobial susceptibility of aerobic organisms.

Method : Bactec FX Automated Blood/Fluid culture System

Specimen : Blood.

Organism : *Candida auris*

Antimicrobial susceptibility	MIC (µg/ml)	Interpretation
Fluconazole	16	Resistant
Voriconazole	0.12	Susceptible
Amphotericin B	0.5	Susceptible
Caspofungin	0.25	Susceptible
Micafungin	0.06	Susceptible
5-Flucytosine	<=1	Susceptible

<End>



- Patient was on Inj. Caspofungin for 8 days after which his fever spikes reduced and repeat blood cultures were sent which came out negative.
- Patient underwent Split Thickness Skin Graft after 18 days of hospital stay.
- The surgery was uneventful and post-operatively, the patient did not have any further fever spikes.
- Repeat blood cultures were negative at the time of discharge and the patient was stable at the time of discharge.

# Case Report 2



- A 31 years old male patient came to the Urology OPD with c/o left flank pain and left abdominal fullness since 10 days.
- No h/o hematuria, burning micturition, weight loss.
- No significant family history.
- Not currently on any medications.
- No co-morbidities.

# On Examination



- Conscious, oriented.
- Afebrile
- Pulse: 86bpm
- BP: 130/80mmHg
- Respiratory rate: 18cycles/min
- sPO2: 98%
- CVS: S1, S2 heard
- RS: Nothing significant

P/A: palpable lump over the left hypochondrium extending below the left subcostal margin, which was non-mobile, non-tender.

Patient was admitted to male Urology ward with the provisional diagnosis of Left Renal mass.

# Lab Investigations



- **CBC:**

- Hb: 12.9 g/dL
- TLC: 10,200/ $\mu$ L
- Platelet count: 170,000/ $\mu$ L
- HCT: 37.90 %

- **Differential Count:**

- Neutrophils 71%
- Eosinophil's 2%
- Lymphocytes 20%
- Monocytes 7%

- PT: 12.24 seconds

- INR: 1.13

- Urine Routine - normal

- Urine culture & sensitivity: No growth

- LFT:**

- Total bilirubin: 1.99 mg/dL
- Conjugated: 0.64 mg/dL
- Unconjugated: 1.35 mg/dL
- AST: 30 U/L
- ALT: 10 U/L
- ALP: 127 U/L
- Total protein: 7.8 g/dL
- S. Albumin: 4.7 g/dL
- S. Globulin: 3.10 g/Dl
- GGT: 26.00 U/L

- MRI Abdomen/Pelvis:
  - Large, solid, cystic, heterogeneously enhancing mass arising from interpolar region and lower pole of left kidney with large exophytic component mainly involving anterior and lateral cortex suggestive of neoplastic etiology;  
? Renal cell carcinoma with Metastasis towards left 10<sup>th</sup> rib.
  - Tumor thrombus in left renal vein extending into IVC.

Patient was posted for Left Radical Nephrectomy + IVC Thrombectomy.



- Surgery was uneventful and the patient was shifted to SICU in view of Paralytic ileus and hemodynamic monitoring.
  
- Post Op. Day-5 (SICU):
  - Patient had 1 episode of vomiting and 2 fever spikes.
  - Blood and urine samples were sent for c/s patient was started on Inj. Linezolid and Inj. Meropenem.
  
- Post Op. Day-6:
  - Urine c/s: No growth.
  - Patient had 2 fever spikes in the evening.
  - Antibiotics were continued.





- Post Op. Day-7:
  - Patient had persistent fever spikes .
  - Blood culture and sensitivity: Budding yeast cells and final identification to be reported.
  - Patient was started on Inj. Fluconazole.
  
- Post Op. Day-10:
  - Final identification was found to be *Candida auris*.
  - Inj. Fluconazole was stopped and patient was started on Inj. Micafungin for 5 days.
  
- After 5 days, Inj. Micafungin was stopped, there were no fever spikes after which repeat blood culture was sent, which was reported No Growth.
  
- Patient's condition was stable 15 days after his surgery and was discharged.

# Discussion



<i>Candida tropicalis</i>	27%
<i>Candida parapsilosis</i>	18%
<i>Candida albicans</i>	15%
<i>Candida glabrata</i>	9.5%
<i>Candida auris</i>	8.3%
<i>Candida pelliculosa</i>	7.2%
<i>Candida krusei</i>	3.6%

## ICMR BLOOD STREAM INFECTION DATA 2022

- *Candida* species are present as normal microbiota in humans but increased prevalence as a common hospital pathogen has been observed as in the last few decades.

## AMR in Candidemia: ICMR data 2022 (% resistant)

Resistance %	<i>C. tropicalis</i>	<i>C. albicans</i>	<i>C. glabrata</i>	<i>C. auris</i>	<i>C. parapsilosis</i>
Anidulafungin	10%	0%	14%	9%	0%
Caspofungin	4%	5%	43%	18%	0%
Micafungin	1%	0%	10%	5%	0%
Fluconazole	7%	5%	10%	100%	13%
Voriconazole	32%	6%	24%	90%	13%

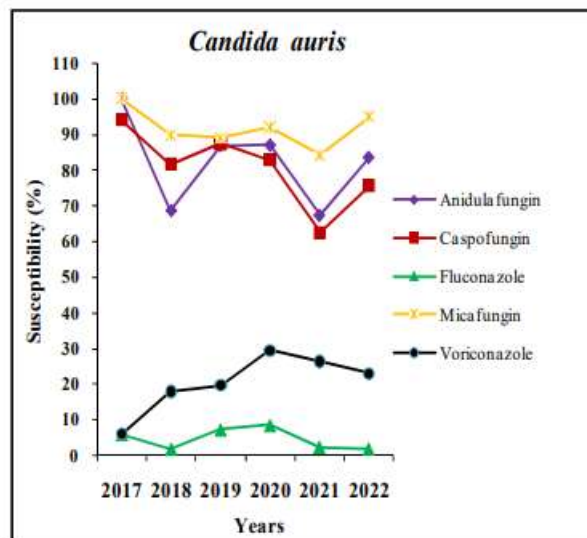


Figure 9.2: Susceptibility trends over the years in seven major yeasts species

# Take Home Message



- The unique characteristics of *Candida auris*, like, ability to survive in biotic and abiotic surfaces, desiccation and tolerance to disinfectants leads to its ability to cause outbreaks in healthcare settings, emerging resistance and intrinsic resistance to multiple antifungal drugs.
- These problems call for the immediate identification of *Candida auris* to prevent its diffusion in the hospital ward and to begin a surveillance of other patients
- Rapid nosocomial spread of *Candida auris* requires strict vigilance of other patients.
- Essential rapport with microbiology laboratories, antimicrobial and antifungal stewardship, and hospital infection prevention and control are essential for optimizing diagnosis and management and curtailing nosocomial spread.

# Acknowledgements



- A special thanks to the departments of Urology, Plastic Surgery and Pediatrics, Dr. D.Y Patil Medical College, Hospital and Research Center, Pune for their guidance in compiling the case reports.

# References



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THANK YOU