A complex case of Necrotising Otitis Externa (NOE)

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Introduction to NOE

- No national/international standards for diagnosis or management of NOE
- Can be a complex disease causing morbidity/mortality
- Pseudomonas often involved which is challenging to treat

Collating data on NOE management

A Multicentre Prospective Cohort Study to Understand Necrotising Otitis Externa in the UK (NOE)

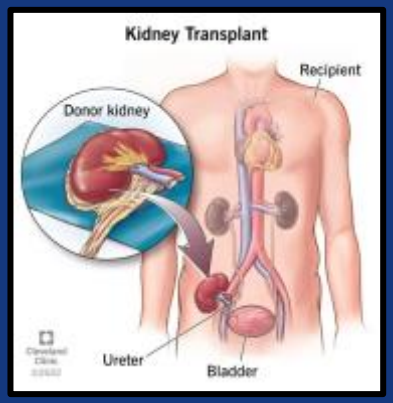
Short title: Improving Outcomes of Necrotising Otitis Externa (IONOE)

IMPROVING OUTCOMES IN NOE

Primary: Describe the demographics, clinical presentation, surgical and medical management and outcomes of clinically possible cases of NOE in the UK.

Sponsored by the University of Oxford

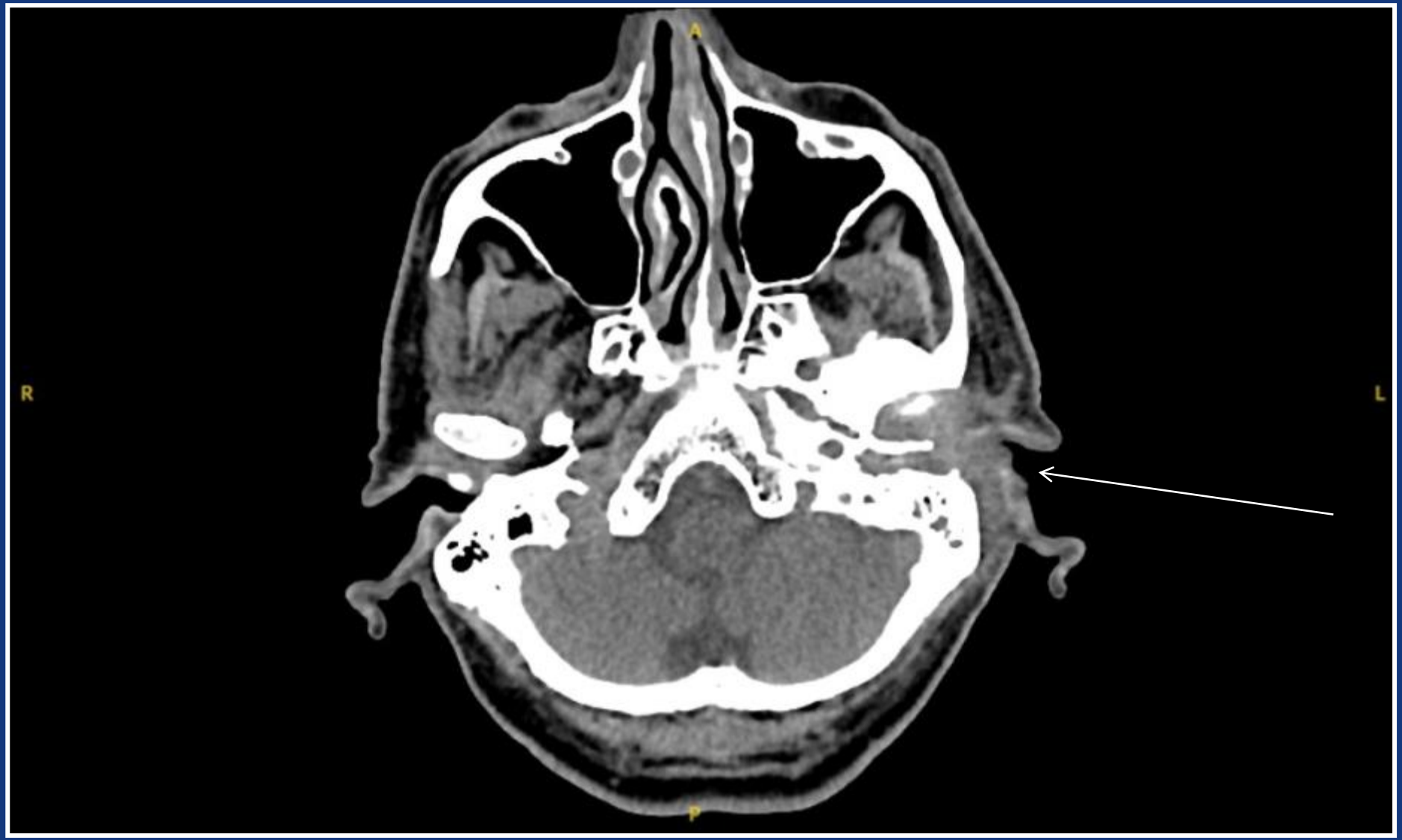
Case: Leicester 2020



- 64 yr old Indian male
- Renal transplant on tacrolimus, MMF, pred
- Type II diabetes on insulin
- Admitted under ENT February 2020
- Malignant otitis externa

Radiology (CT petrous bones)

- Extensive opacification left external auditory canal with bony irregularities
- Soft tissue involvement
- No skull base or nasopharyngeal involvement


A
R
L
P

Microbiology

04/03/2020 14:00 Ear Swab left Ear

Fungal culture
Candida species ISOLATED

Routine culture
+++ Anaerobes
Sensitive : metronidazole.
++ Pseudomonas aeruginosa
Sensitive : amikacin, ceftazidime, ciprofloxacin, gentamicin, meropenem, piperacillin / tazobactam.

Repeat swab (to try and get candida sensitivities)

12/03/2020 20:25 Ear Swab

Routine culture

No fungal pathogens

+++ Pseudomonas aeruginosa

Remained fully sensitive

Treatment

- Tazocin during hospital stay
- Discharged on ceftazidime 1g BD (eGFR 46ml/min) – later increased to 2g BD/3g BD

Ceftazidime overview

- Good anti-pseudomonal activity.
- Usual adult dose: 1-2g TDS.
- Can be given IV or IM; no oral preparation.
- Not to be used in patients with a serious penicillin allergy (e.g. anaphylaxis).

Dosing in renal impairment

GFR (ml/min)	Dose
31 – 50	1g BD*
16 - 30	1g every 24 hours*
6 - 15	500mg every 24 hours**
<6	500mg every 48 hours**

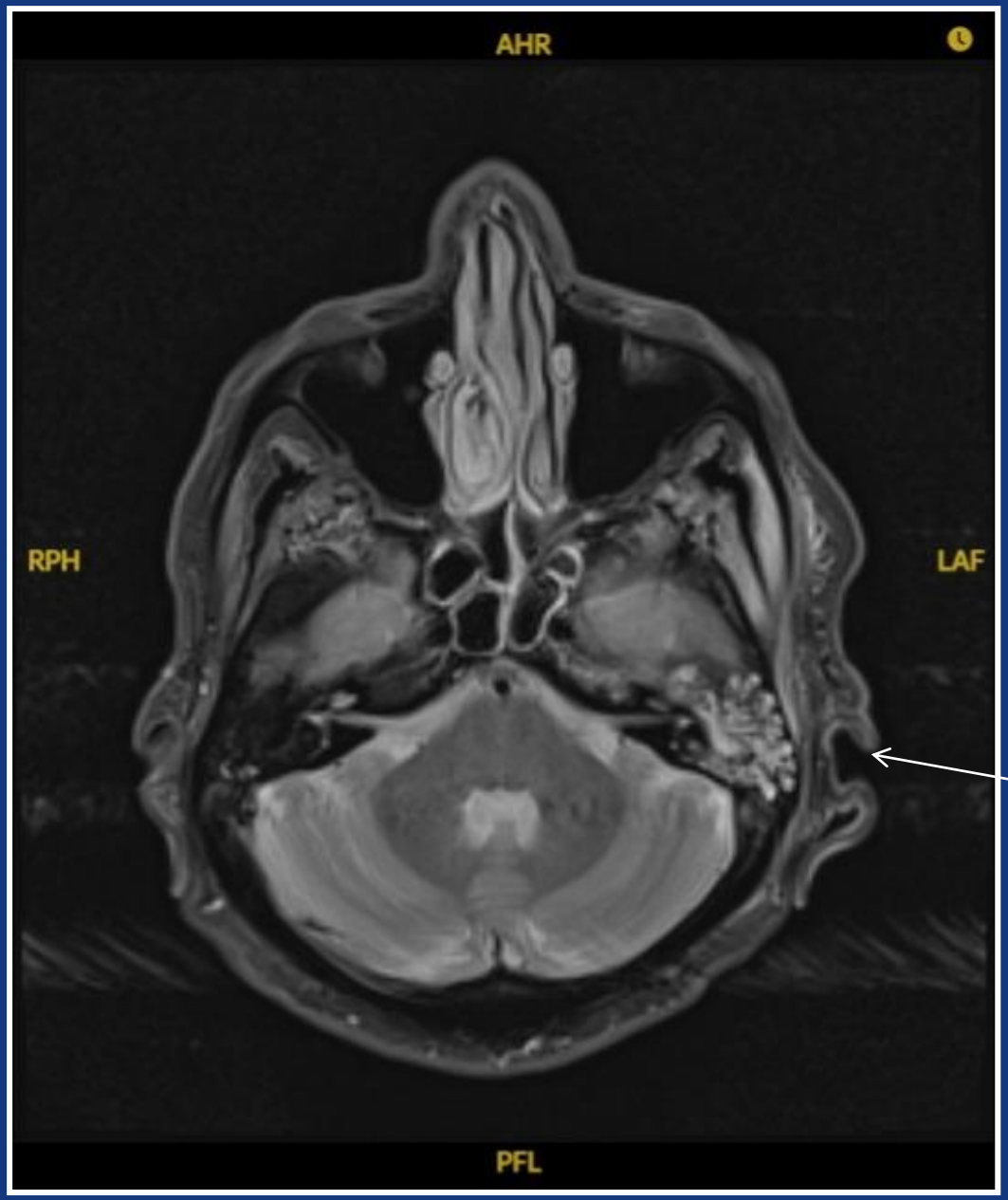
*Can be increased to the maximum dose possible (2g per dose) under specialist micro advice

** Can be increased to 1g per dose under specialist micro advice

April 2020

- MRI scan end April 2020 showed left skull base changes/parapharyngeal region and suprazygomatic space inflammation; some dural enhancement but no intracranial extension

- Impression = Worsening radiological appearances on anti-pseudomonal cover alone
- (No histological diagnosis)


AHR
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Spring/early summer 2020

- Worsening MRI changes
- Beta D glucan positive (237 and persistently elevated)
- Repeated ear swabs and polyp culture negative

Spring/early summer 2020

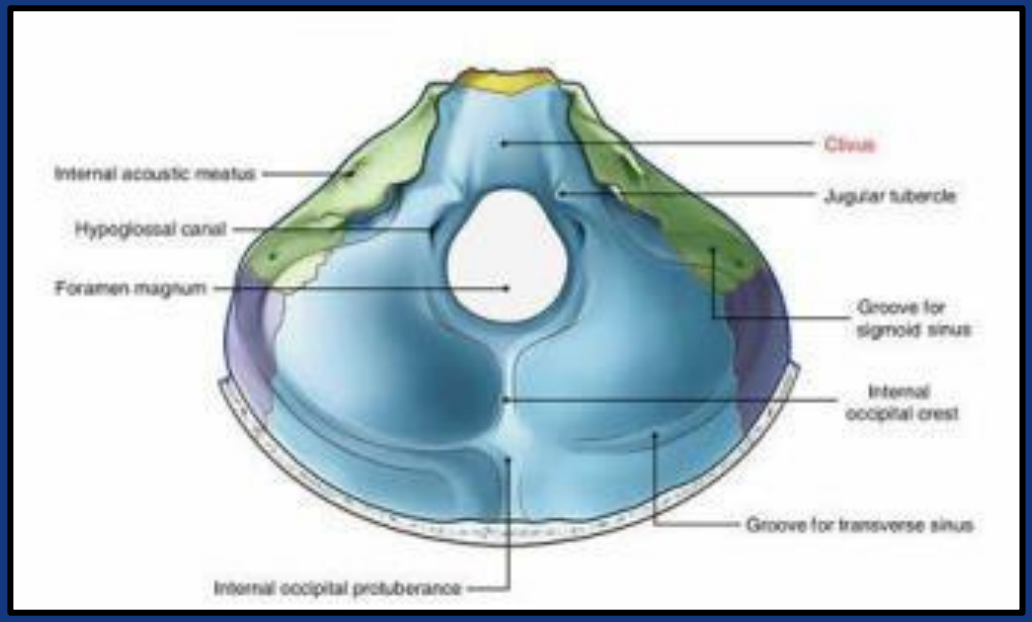
- Addition of antifungal cover
  - IV caspofungin
- Intensification of anti-pseudomonal cover
  - Ciprofloxacin 750mg BD
  - Continuation of Ceftazidime
- Discussion with renal re reducing immunosuppression
  - Mycophenolate was stopped
  - Tacrolimus level run deliberately low

June 2020

- Severe ear pain
- Paid privately for hyperbaric oxygen therapy
  - Cochrane review 2013 found no RCT
- Losing weight, becoming frailer

June 2020

- Repeat scans June 2020 show persistent left skull base, parapharyngeal region and masticator space with new clivus involvement

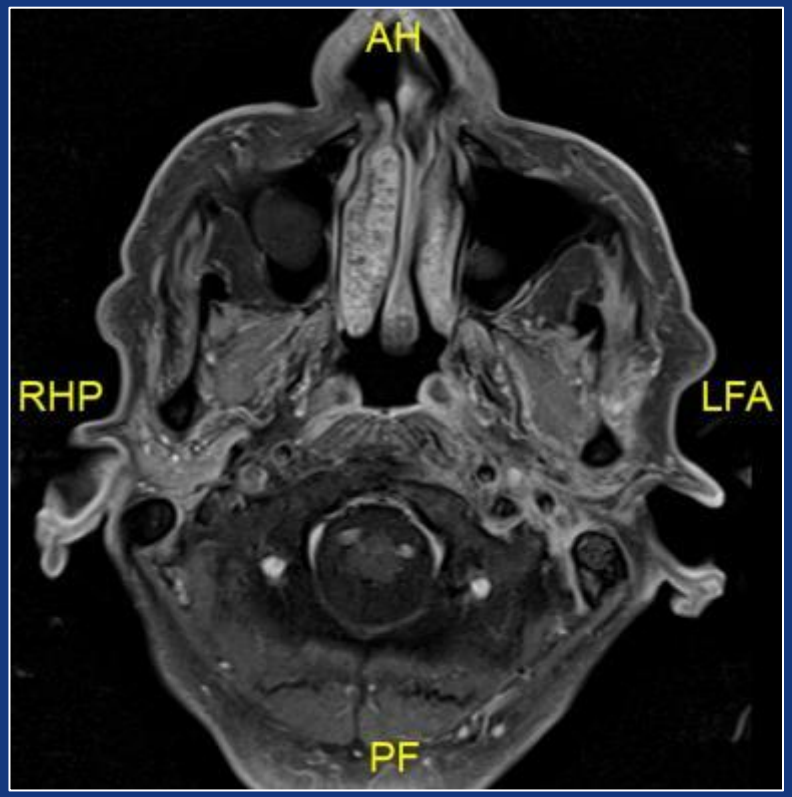


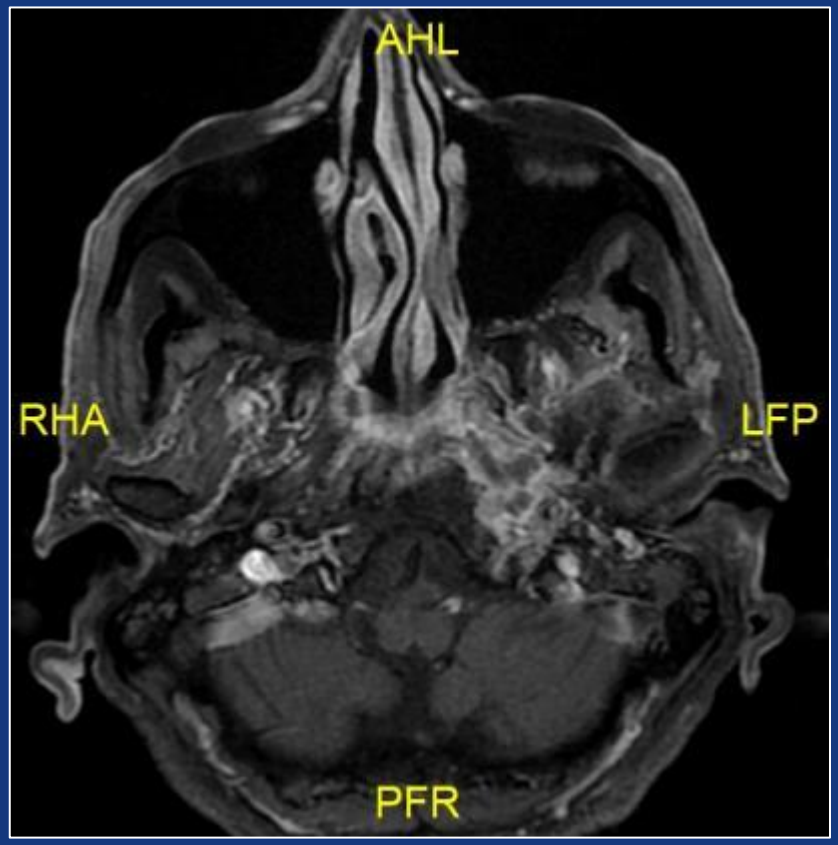
Clivus – latin for “slope”

Bony part of the cranium at the skull base, sloping backwards

July 2020

- IV Caspofungin switched to oral voriconazole 200mg BD/300mg BD July 2020
- IV Ceftazidime/PO Ciprofloxacin continued
- Hyperbaric oxygen continued


AH
RHP
LFA
PF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LFP
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February 2021

- First monthly NOE MDT meeting occurred in Leicester
  - 2 radiologists
  - ENT consultants/ANPs
  - OPAT (ID) consultant/nurses

- Plans for:
  - Skull base team referral
  - Liaison with renal team re. immunosuppression

May 2021

- Not really making much progress
- Largely bed bound

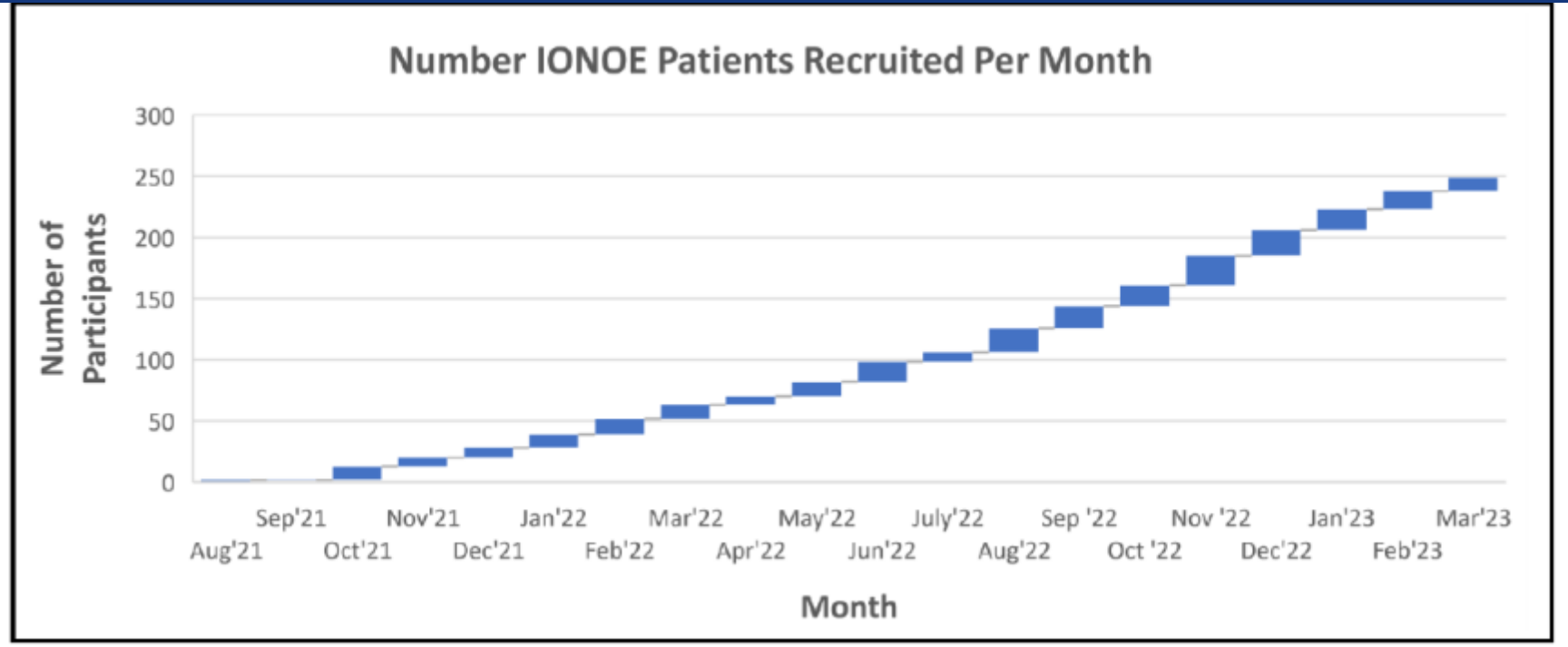
- Teicoplanin added for empirical gram positive cover
- Voriconazole switched to posaconazole
- Continued ceftazidime/ciprofloxacin

- Treatment stopped February 2022 after imaging finally showed improvement in the skull base appearances
- Liaison with renal team
- RIP August 2022

Outcomes/challenges from this case

- Understanding the driving pathogen was challenging without deep specimens
- TDM of voriconazole v tacrolimus and adjusting immunosuppressive regime
- NOE MDT formation was extremely helpful in guiding treatment decisions

IONOE trial


Number IONOE Patients Recruited Per Month
Number of Participants
300
250
200
150
100
50
0
Aug'21
Sep'21
Oct'21
Nov'21
Dec'21
Jan'22
Feb'22
Mar'22
Apr'22
May'22
Jun'22
July'22
Aug'22
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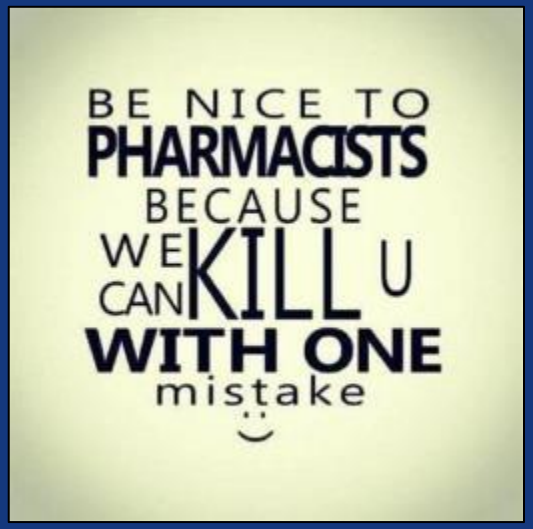
Nov '22
Dec'22
Jan'23
Feb'23
Mar'23
Month


BE NICE TO
PHARMACISTS
BECAUSE
WE CAN KILL U
WITH ONE
mistake


ENT
CUT THROAT
SPECIALITY


NURSE
Don't mess with me
I get PAID to stab people
with sharp objects

Team work


I AM A
NEPHROLOGIST
TO SAVE TIME,
LET'S JUST ASSUME
THAT I AM
NEVER WRONG


SUPPORT BACTERIA!
it's the only culture some people have


I'D AGREE WITH YOU...
BUT THEN WE'D BOTH
BE WRONG


LEARNING ABOUT FIFTY
SHADES OF GRAY
MEANS STUDYING
RADIOLOGY