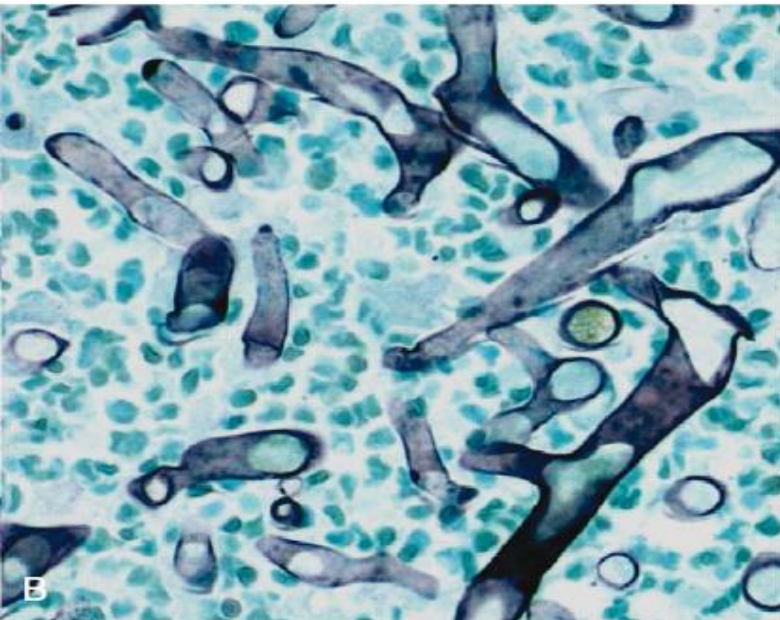


A case of COVID-19 associated Pulmonary mucormycosis



Dr Surabhi Madan

FID (Fellowship Infectious Diseases),

MD Medicine

Infectious Diseases Consultant,
CIMS, Ahmedabad

Case

- 47y M patient, weight 86 kg
- K/C/O - HT

H/O COVID-19:

- DOS Onset- 14/11/20 - Mild weakness
- 15/11 - RAPID COVID-19 TEST - POSITIVE
- 16/11 - Fever (100 F)
- CT Chest S/O COVID-19; CT- SS – 5/25

Rx received (elsewhere), 22/11/20 onwards:

- Tab Favipiravir x 5 d
- INJ. Methylprednisolone (125 mg) OD x 5 days
- Tab. Medrol (16 mg) TDS x 5 days
- Tab. Medrol (16 mg) BD x 5 days

Responded well, no hypoxia

1/12/20- Fever again, with cough and hemoptysis (Day 16 of COVID-19); Rx- Oral steroids with Doxycycline f/b Faropenem

3/12/20- CT Chest- SS- 34/40

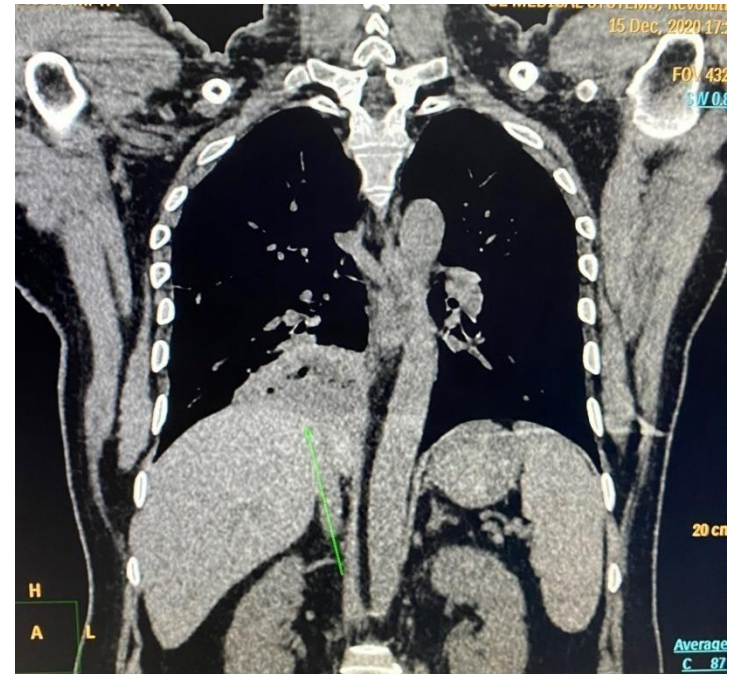
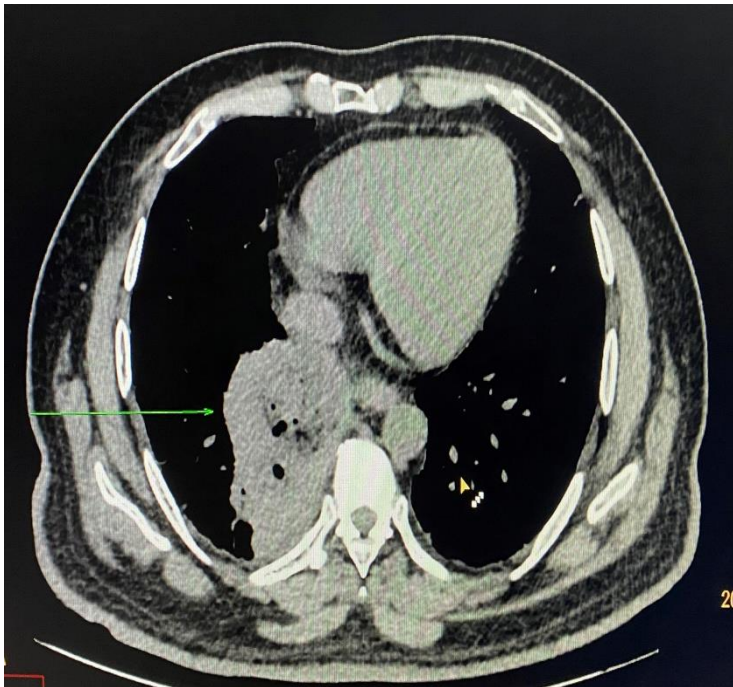
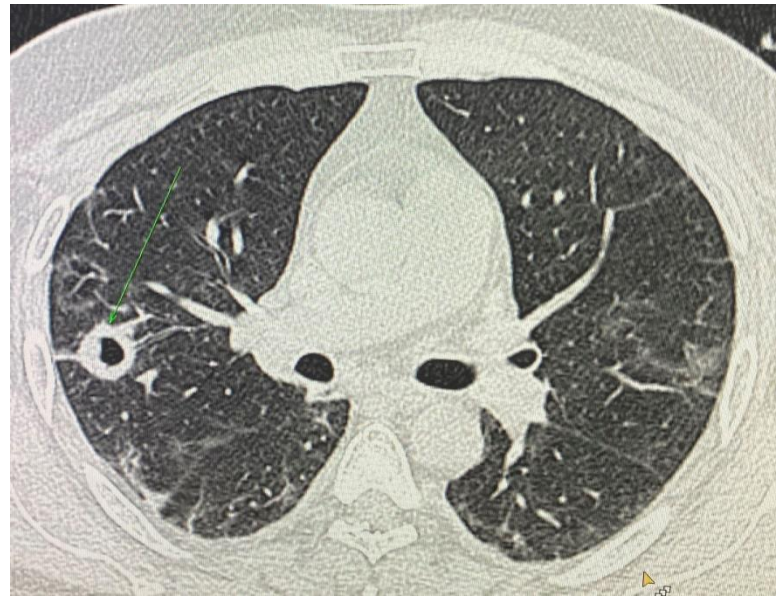
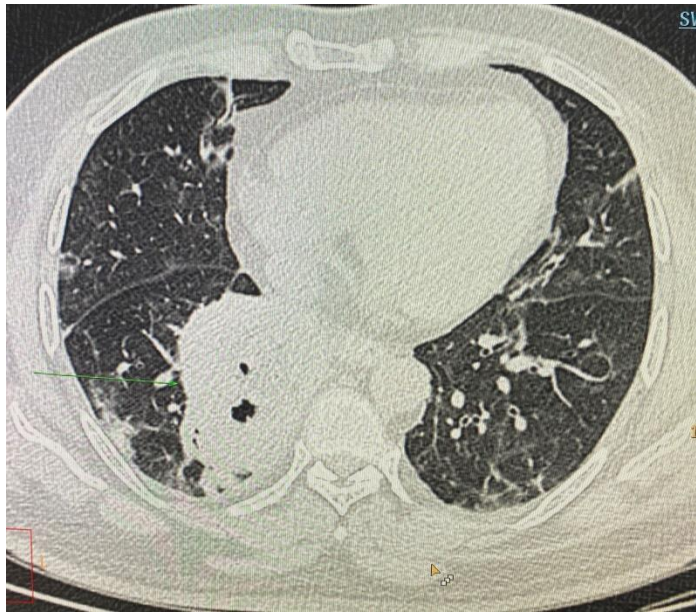
	18/11	21/11	26/11	1/12	4/12	11/12
Hb	14.7	14.1	13.5	13.3	13.4	11.8
TC	5300	7500	10900	16660	25600	11770
DC	62/34/2/2	81/15/2/2	84/10/3/3	84/14/2/2	82/14/2/2	83/11/0/3
PC	183000	158000	175000	304000	325000	191000
CRP	9.43	20.10	48.88	39.12	68.97	312
CREAT	0.89		1.34	1.16	1.40	1.31
SGPT/OT	50/44	88	296		135	251
D-DIMER	84	170	367	431	973	811
FERRITIN	44.6	138.6				
IL - 6		27.31				

- 14/12/20- Presented to us and admitted
- General condition fair
- Tachycardia, no hypoxia
- Cough with hemoptysis
- Persistent fever
- ***CT chest and PNS-***

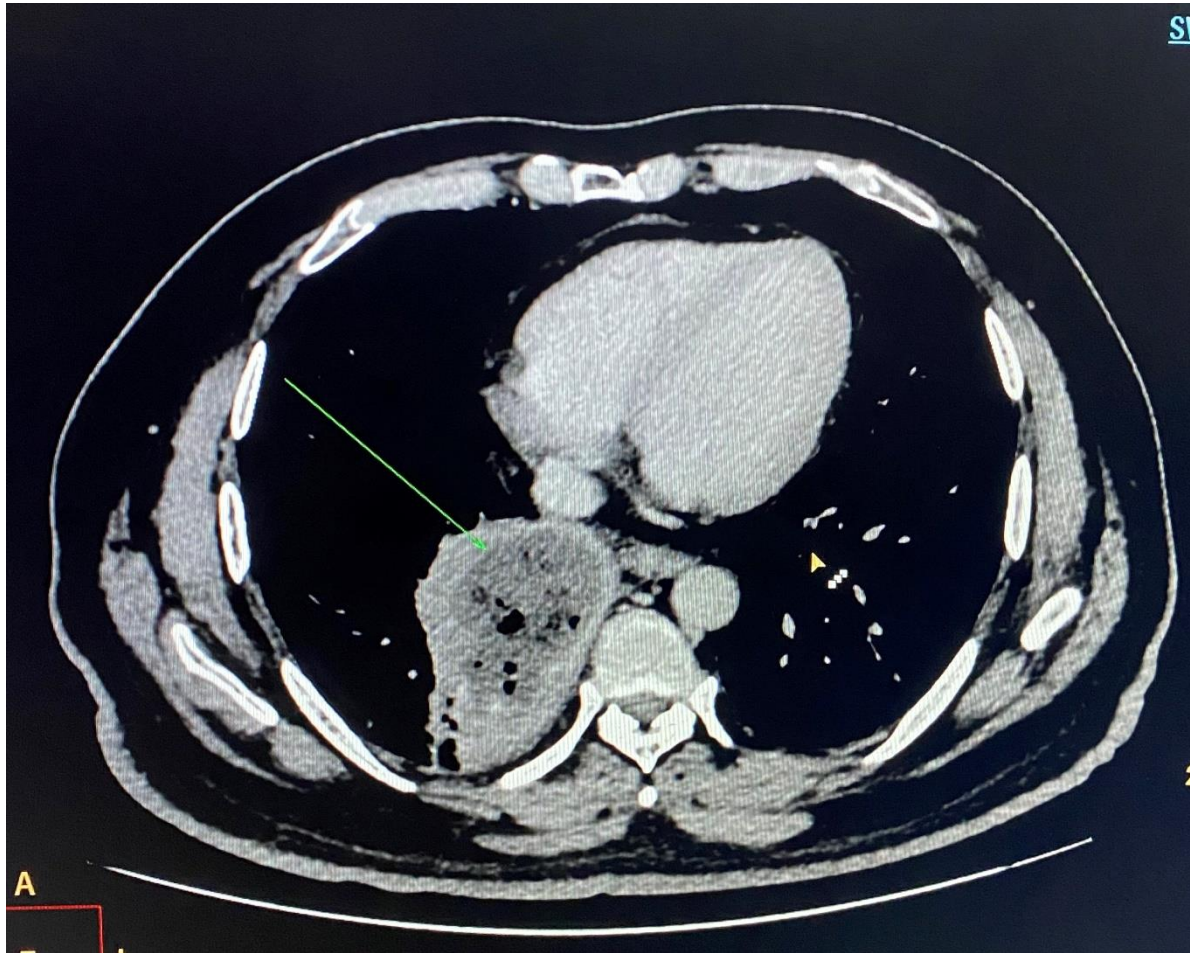
Necrotic consolidation in Rt L/L, Cavitory lesions in posterior segment of Rt U/L

Multifocal ill defined GGOs, delayed changes of COVID-19 Pneumonia

CT PNS- Normal

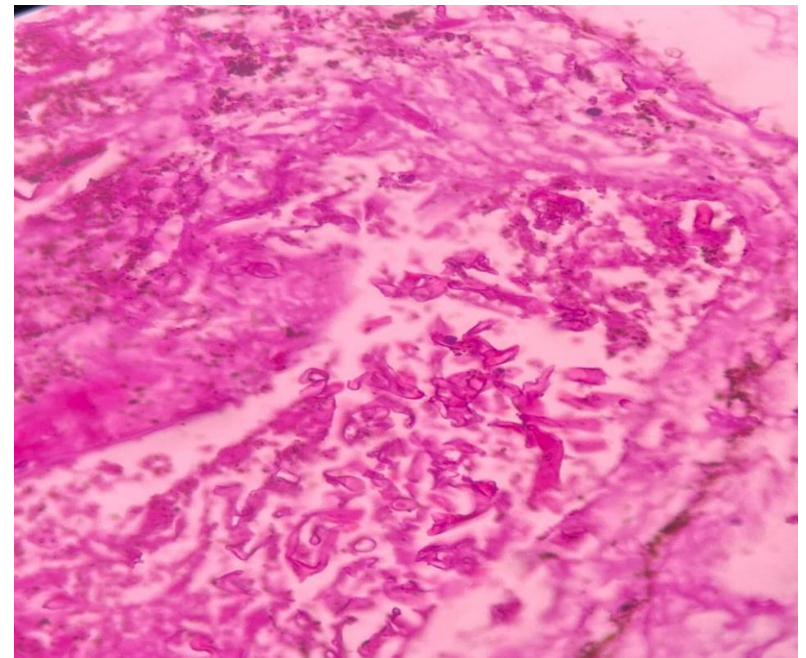
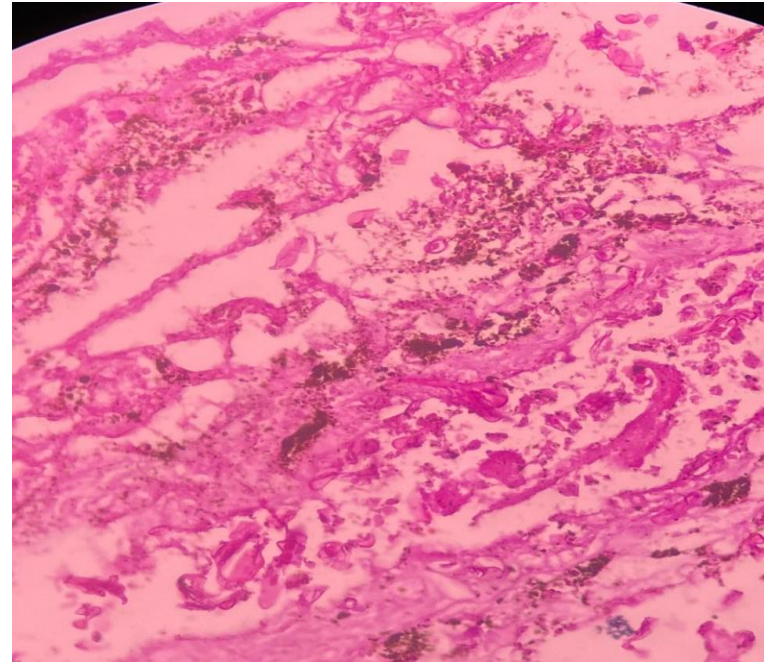


Reverse halo sign

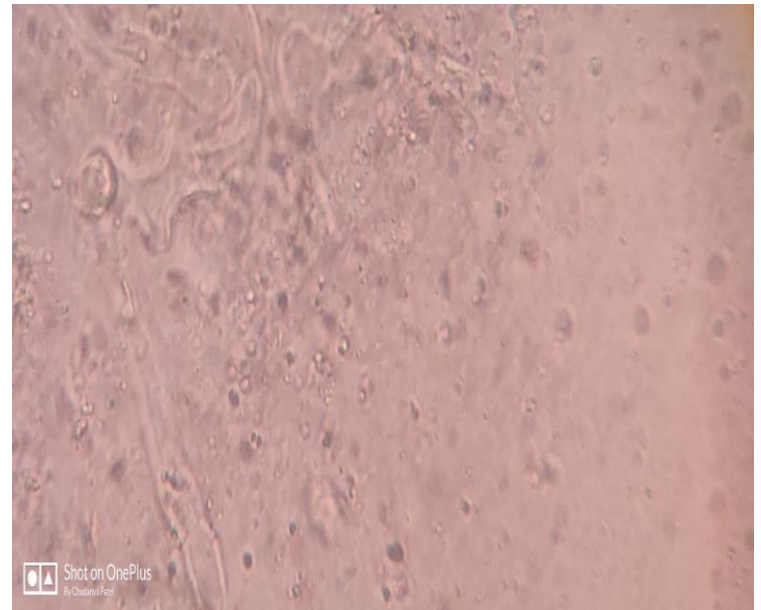
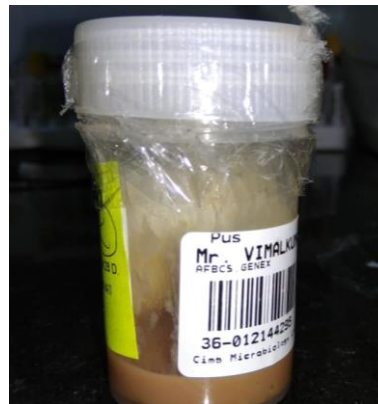


	15/12	17/12	20/12	27/12
Hb	10.5	11.3	10.2	
TC	6240	4400	8250	
DC		65/25/4/6	78/16/1/7	
PC	198000	247000	337000	
CREAT E	1.07		1.49	
SGPT/ OT	25/18			
CRP	100.7	63.34		
D- DIMER				7433

- Empirical antibiotics- Meropenem and Linezolid started
- Fever persisted for next 48 hours
- Bronchoscopy with TBLB- Primary stains, aerobic and fungal cultures negative
- Lung Biopsy – broad aseptate hyphae s/o mucormycosis with angioinvasion

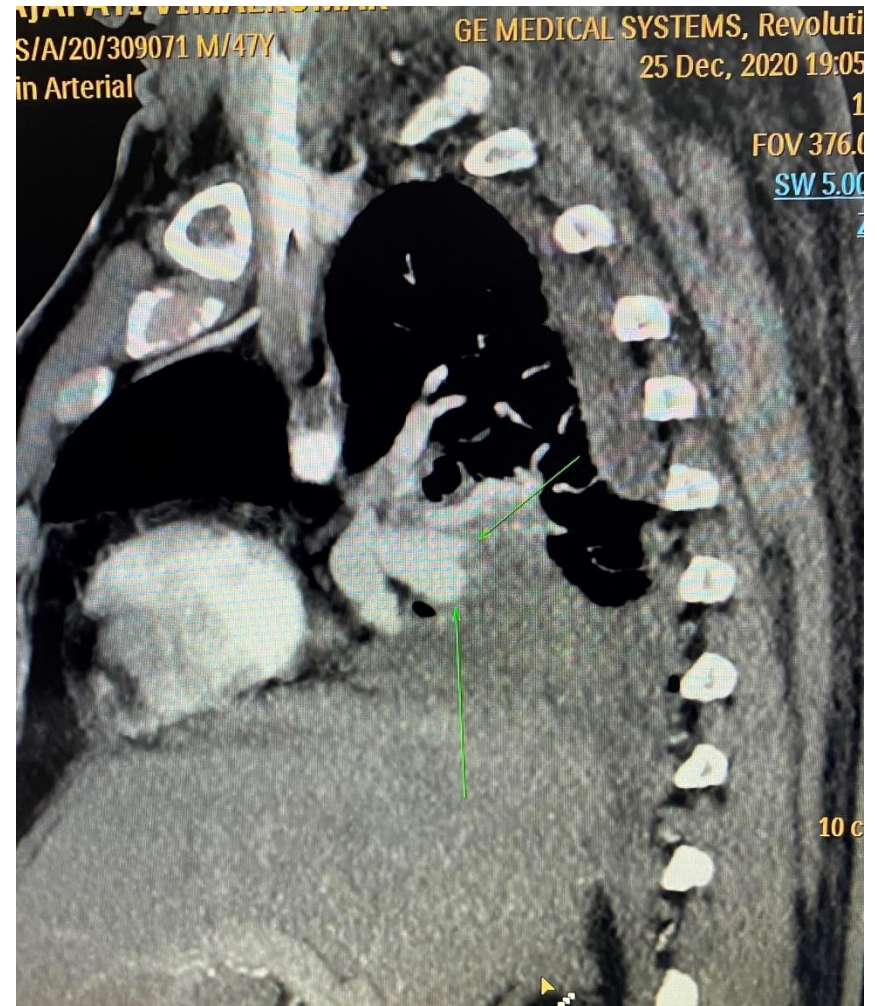
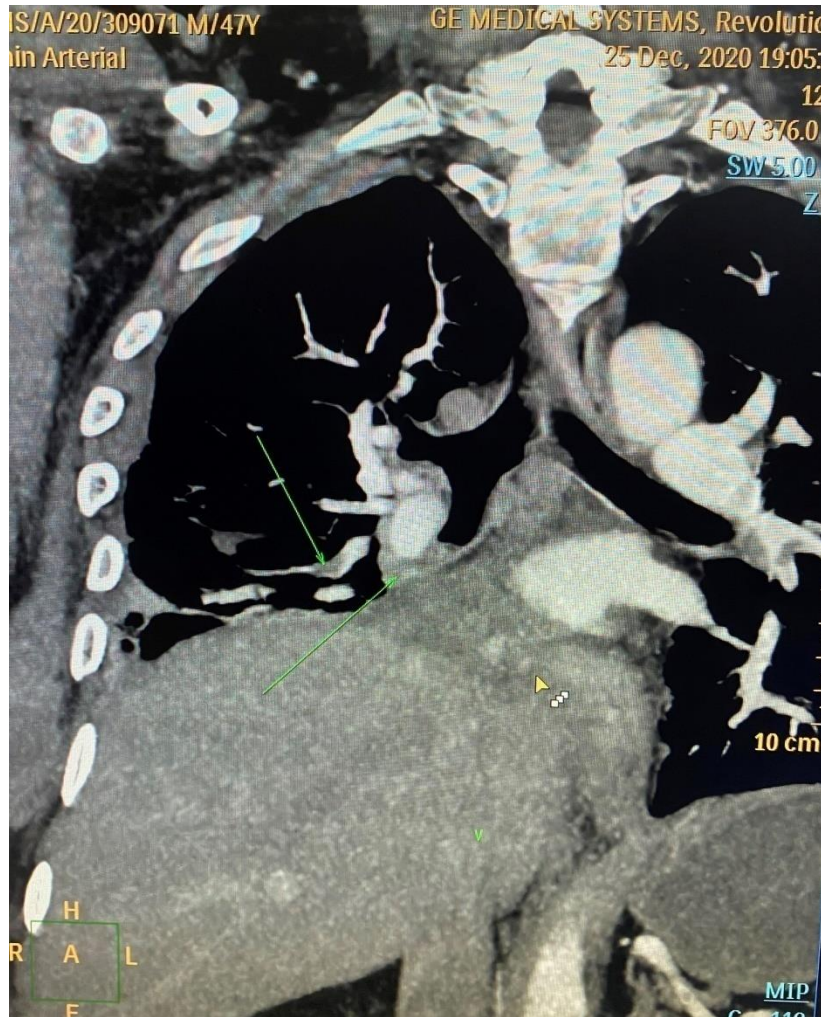


- Liposomal Amphotericin B (5mg/kg) 400 mg/d started
- Patient became afebrile, hemoptysis persisted
- 19/12/20- Right Thoracotomy + Lower lobectomy + Diaphragm repair
- Involvement of the diaphragm and the liver capsule found
- KOH positive for Broad aseptate hyphae

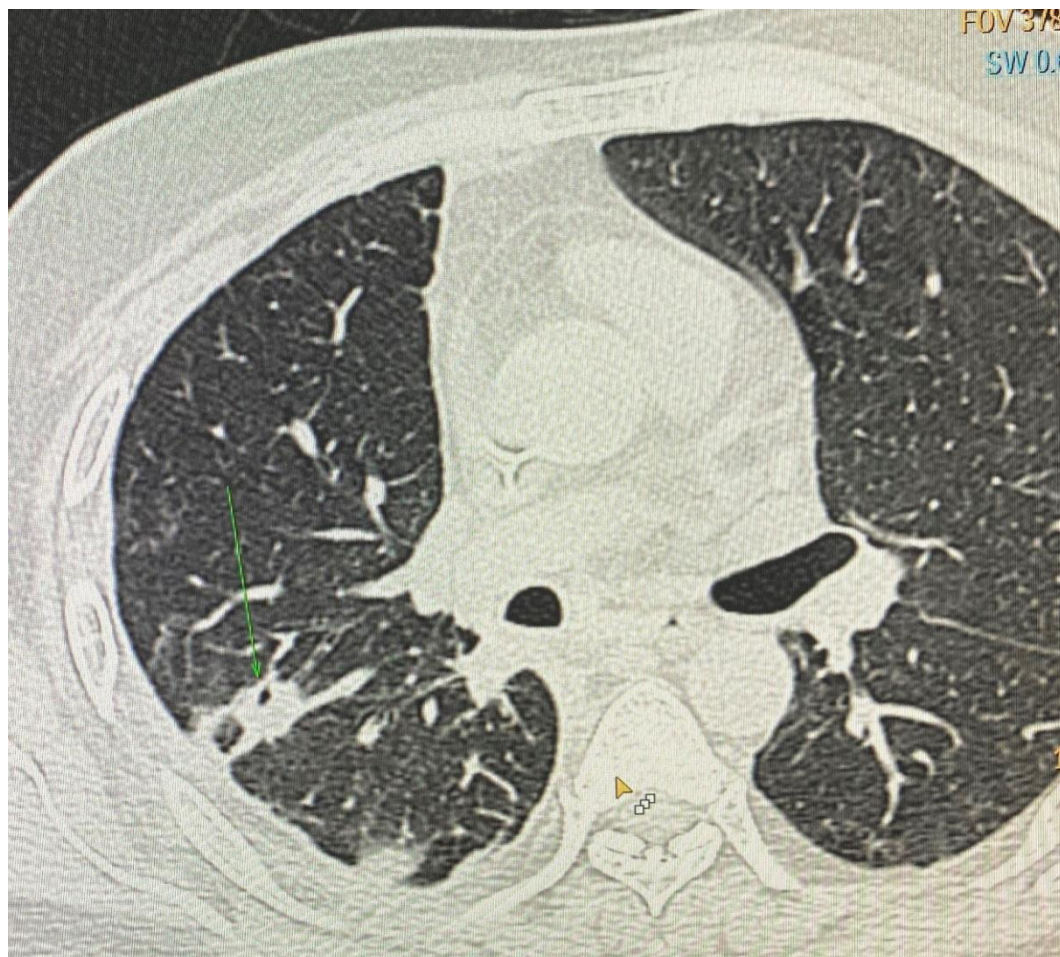


POD- D 6 - CT Chest- 25/12/20

Acute thromboembolism involving distal Rt pulmonary artery & segmental branches of Rt U/L, M/L, with lower lobar left pulmonary artery- LMWH



D-16 POD – Small cavity in the Rt U/L



- 4/1/21- Isavuconazole added (200 mg TDS for 2 days f/b 200 mg OD)
- Changed to Posaconazole due to financial reasons
- Total duration of treatment- 4 months (6 weeks of L-AmB followed by oral ISV/Posaconazole)

Reg. No : 1035501526	Reg. Date : 10-Mar-2021 20:13	Collected On : 10-Mar-2021 12:00
Name : Vimalkumar Prajapati		Report Date : 13-Mar-2021
Age : 47 Years	Sex : Male	Dispatch At :
Ref. By :		Tele No:
Location :		

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Biological Reference Interval</u>
* POSACONAZOLE TROUGH LEVEL	1.3	µg/mL	Detection Limit: 0.25 µg/ml
<i>High Performance Liquid Chromatography method.</i>			
Instrument: HPLC Agilent Technologies 1220 Infinity LC.			
Importance of Therapeutic drug monitoring (TDM) for Posaconazole:			

Mucormycosis

Heterogeneous population

- Uncontrolled DM, DKA; haematological malignancy, transplant, recipients, chronic granulomatous diseases, HIV, neutropenic patients
- Immunocompetent hosts - via direct inoculation of organisms into disrupted skin or mucosa (extensive burn, insect bite or traumatic injury)
- Healthcare associated mucormycosis - catheters, adhesive tapes and tongue depressors; few epidemics are also described
- IV drug abusers may develop isolated renal mucormycosis
- Rarely, patients with apparently normal immune system can also develop rhino-orbito-cerebral or renal disease
- **COVID-19**

Mucormycosis--a formidable challenge

[Rajeev Soman](#), [Surabhi Madan](#)

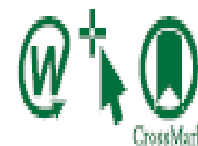
Editorial, J Assoc Physicians India 2013 May;61(5):303

- Therapeutic challenge- Multidisciplinary approach, complete, extensive and repeated debridements
- Early and Aggressive medical treatment with high doses of AmB (Liposomal preparation is preferred over deoxycholate)
- Dose of L-AmB- preferably begin with 5 mg/kg
- Role of Combination Rx – AmB with ISV/Posaconazole- in cases where debridement/ source is suboptimal
- Duration of treatment- Depends on clinical/ radiological and microbiological cure- may be prolonged over months in patients with mucor affecting lungs, CNS, Spine etc

Outcome depends on

- Underlying risk factors- Eg- Control of hyperglycemia, reversal of neutropenia
- Early diagnosis
- Multidisciplinary approach
- Site and extent of infection
- Source control
- Compliance to medication (Toxicity, cost, Technical issues)

Global guideline for the diagnosis and management of mucormycosis: an initiative of the European Confederation of Medical Mycology in cooperation with the Mycoses Study Group Education and Research Consortium



Oliver A Cornely, Ana Alastruey-Izquierdo, Dorothee Arenz, Sharon CA Chen, Eric Dannaoui, Bruno Hochhegger, Martin Hoenigl, Henrik E Jensen,

www.thelancet.com/infection Vol 19 December 2019

Strongly recommended
 Moderately recommended
 Marginally recommended
 Recommended against

A

Suspected and confirmed mucormycosis are emergencies and require rapid action

Surgical debridement with clean margins
for 3 purposes: (1) disease control, (2) histopathology, (3) microbiological diagnostics
Plus
Immediate treatment initiation

Avoid slow
escalation of doses

If brain
involvement

If SOT

If preexisting renal
compromise

Isavuconazole IV
3x 200 mg day 1-2
1x 200 mg per
day from day 3

Posaconazole oral
suspension
4x 200 mg per day

Liposomal
amphotericin B
<5 mg/kg per day

Avoid
amphotericin B
deoxycholate
Any dose

Liposomal
amphotericin B
5-10 mg/kg per
day from
day 1

Avoid slow
escalation of doses

Liposomal
amphotericin B
10 mg/kg per day
from day 1

Avoid slow
escalation of doses

Liposomal
amphotericin B
or amphotericin B
lipid complex
10 mg/kg per day
from day 1

Isavuconazole IV
3 x 200 mg day 1-2
1 x 200 mg per
day from day 3

Posaconazole IV
2 x 300 mg day 1
1 x 300 mg per day
from day 2

Posaconazole IV
2x 300 mg day 1
1x 300 mg per day
from day 2

Response assesment
(eg weekly imaging)

Stable disease or partial response

Progressive disease

Toxicity

Continuation of 1st line
treatment or change to oral
treatment

Isavuconazole PO
3x 200 mg day 1-2
1x 200 mg per day from day 3

or

Posaconazole DR tablets
2x 300 mg day 1
1x 300 mg per day from day 2

Isavuconazole IV
3x 200 mg day 1-2
1x 200 mg/day 2 from day 3

or

Posaconazole IV or DR tablets
2x 300 mg day 1
1x 300 mg per day from day 2

Posaconazole oral suspension
4x 200 mg per day

Liposomal amphotericin B
10 mg /kg per day from day 1

Amphotericin B lipid complex
or
Liposomal amphotericin B
5 mg /kg per day from day 1

Combination with posaconazole

Isavuconazole IV
3x 200 mg day 1-2
1x 200 mg/day 2 from day 3

or

Posaconazole IV or DR tablets
2x 300 mg day 1
1x 300 mg per day from day 2

Posaconazole oral suspension
4x 200 mg per day

Amphotericin B lipid
complex or liposomal
amphotericin B
5 mg /kg per day from day 1