



RHINO-ORBITAL CEREBRAL MUCOR MYCOSIS - A MULTI DISPLINARY APPROACH OF MANAGEMENT AT GGH VIJAYAWADA SIDDHARTHA MEDICAL COLLEGE.

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ABSTRACT **Back ground** ; Rhino cerebral mucor mycosis noted in 2021-2022 in India after second wave of covid 19 assumed to be after Delta virus, left highest morbidity and mortality. A study conducted at GGH Vijayawada by the team of ENT along with Neurosurgeons, Faciomaxillary, Ophthalmologists ,Neurophysicians , Nephrologists, Pulmonologists, Pathologists and Microbiologists ,during the period of 2020 september to 2021 october a 600 cases were recorded .and these pts were admitted,and medically surgically treated, reduced the mortality and morbidity. During this phase of treatment mortality noted of 10 percent ,morbidity noted 50percent, recurrences noted with various presentations like pots puffy tumors, with osteomyelitis of the maxilla, loss of vision ,diffuse mottling of facial bones, nephrotoxicity etc. **Method**; A study conducted at GGH Vijayawada on 600 pts during the period of 2020 september to 2021 october and these pts were admitted, and medically surgically treated, reduced the mortality and morbidity. During this phase of treatment mortality noted of 10 percent ,morbidity noted 50percent ,20percent recurrences noted with various presentations like pots puffy tumors, with osteomyelitis of the maxilla, loss of vision ,diffuse mottling of facial bones, nephrotoxicity etc. **Results**: Maximum no of pts are 40-60 yrs, mean duration after second wave of covid is 2months, the most common complaint is facial pain (40%),orbital cellulitis(30%), unilateral facial edema(20%),,severe headache(10%),.Loss of vision (5%),altered sensorium(3%) loss of consciousness, palate perforation, loosening of the teeth, nasal obstruction, loss of smell, nasal discharge, etc

KEYWORDS : Delta vius,diabetics,obesity, mucor mycosis,debridement,amphotericin B

Introduction ;

Mucormycosis belongs to zygomycosis group of fungus grows on dead decayed materials and normally does not grow in healthy individuals, however huge number of these cases are noted through out the India after epidemic of Delta virus variant of Corona virus , and seen in Diabetic pts in large no and also in immunocompromised individuals ,as this fungus thrives on Iron enriched media and also in acidic PH. the reasons of increased ferritin levels in the pts with Delta variants assumed to be due to cytokine storm releases the end products like serum ferritin and this virus damages the Betacells of the Pancreas leads to hypoinsulinemia and hyper glycemia which produces the acidic ph these are favourable to grow the fungal spores .once the mycelium is formed, it's non septate hyphae causes the endarteritis, ischemia of the mucosa black crust called as eschar -necrosis of the surrounding structures ,spreads rapidly into the adjacent structures (various sinuses,orbit,brain) .causes morbidity mortality .. Most of the pts are associated with comorbid conditions like Diabetes, Hypertension, HIV, Dialysis pts, Malignancy. Cases are seen in 40-60 yrs, Males are predominant, Unilateral involvement more in Maxillary sinus involvement followed by ethmoids, Frontal, sphenoid sinuses. These cases are admitted with blood investigations ,CT of Paranasal sinuses, MRI with T1 weighted and T2 weighted Gadolinium scans are taken, surgically debrided the necrosed tissue with wide MMA (modified Denkers) done post operatively Amphotericin B intravenously for 4 weeks followed Posaconazole Injections for 2weeks.

Exclusion criteria ; children, pregnant women, pts below 30 yrs

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Table 1. Distribution Of Sample Size Gender And Age Group Wise People

Sl. NO	Age group	Female Number	Female %	Male Number	Male %	TOTAL Number	TOTAL %
1	0-19	1	0.37%	0	0.00%	1	0.37%

Sl. NO	Age group	Female Number	Female %	Male Number	Male %	TOTAL Number	TOTAL %
2	20-39	20	7.41%	42	15.56%	62	22.96%
3	40-59	57	21.11%	101	37.41%	158	58.52%
4	60-79	12	4.44%	36	13.33%	48	17.78%
5	80-100	1	0.37%	0	0.00%	1	0.37%
	Grand Total	91	33.70%	179	66.30%	270	100.00 %

Table 2. Gender Wise Vaccination:

Sl. NO	VACCINATION	Female		Male		TOTAL	
		Num ber	%	Num ber	%	Num ber	%
1	1 st Dose Vaccinated	1	0.37%	0	0.00%	1	0.37%
2	NOT VACCINATED	90	33.33%	179	66.30%	269	99.63%
	Grand Total	91	33.70%	179	66.30%	270	100.00%

Table 3. Gender wise Comorbid Conditions:

Sl. NO	COMORBID CONDITONS	Female		Male		TOTAL	
		Num ber	%	Num ber	%	Num ber	%
1	DM+ HTN-	1	0.37%	0	0.00%	1	0.37%
2	CKD, DIABETIC, RHEUMATOID Arthritis	1	0.37%	0	0.00%	1	0.37%
3	DIABETIC	0	0.00%	2	0.74%	2	0.74%
4	DM-, HTN-	6	2.22%	19	7.04%	25	9.26%
5	DM-, HTN-, RVD +	0	0.00%	1	0.37%	1	0.37%
6	DM-, HTN+	1	0.37%	2	0.74%	3	1.11%
7	DM+	17	6.30%	29	10.74 %	46	17.04 %
8	DM+, ASEPTATE HYPHAE	1	0.37%	0	0.00%	1	0.37%
9	DM+, BA+, PTB+	1	0.37%	0	0.00%	1	0.37%
10	DM+, CAD+ BRONCHIAL ASTHMA	0	0.00%	1	0.37%	1	0.37%
11	DM+, CVA+	0	0.00%	1	0.37%	1	0.37%

12	DM+, HTN-	30	11.11 %	64	23.70 %	94	34.81 %
13	DM+, HTN -	1	0.37%	3	1.11%	4	1.48%
14	DM+, HTN-	0	0.00%	1	0.37%	1	0.37%
15	DM+, HTN-, CKD+	2	0.74%	0	0.00%	2	0.74%
16	DM+, HTN-, HBSAG +	0	0.00%	1	0.37%	1	0.37%
17	DM+, HTN+	16	5.93%	23	8.52%	39	14.44
18	DM+, HTN+ KOH MOUNT MULTIPLE BROAD ASEPTATE HYALINEHYPHAE SEEN	0	0.00%	1	0.37%	1	0.37%
19	DM+, HTN+, ANEMIA+	1	0.37%	0	0.00%	1	0.37%
20	DM+, HTN+, CAD+	0	0.00%	3	1.11%	3	1.11%
21	DM+, HTN+, KOH FUNGAL ELEMENTS SEEN	0	0.00%	1	0.37%	1	0.37%
22	DM+, HTN+, KOH MOUNT FUNGAL SEEN		0.00%	1	0.37%	1	0.37%
23	DM+, HTN+, KOH, THIN ASEPTATE HYPHAE SEEN		0.00%	1	0.37%	1	0.37%
24	DM+, HTN+, CAD+	0	0.00%	1	0.37%	1	0.37%
25	DM+, KOH ASEPTATE HYPHAE	0	0.00%	2	0.74%	2	0.74%
26	DM+, KOH MOUNT BROAD ASEPTATE HYPHAE OBSERVATION	0	0.00%	1	0.37%	1	0.37%
27	DM+, CAD	0	0.00%	1	0.37%	1	0.37%
28	DM+, HTN-	3	1.11%	2	0.74%	5	1.85%
29	DM+, HTN-, KOH MOUNT +VE	0	0.00%	1	0.37%	1	0.37%
30	DM+, HTN+	2	0.74%	0	0.00%	2	0.74%
31	DM+, HTN+, RVD+	0	0.00%	1	0.37%	1	0.37%
32	HIV+, DM-, HTN-	1	0.37%	0	0.00%	1	0.37%
33	HTN+	1	0.37%	0	0.00%	1	0.37%
34	HTN+, DM+, CKD	1	0.37%	0	0.00%	1	0.37%
35	KOH- ASEPTATE HYPHAE	0	0.00%	1	0.37%	1	0.37%
36	KOH MOUNT MULTIPLE BROAD ASEPTATE	1	0.37%	0	0.00%	1	0.37%
37	KOH, ASEPTATE HYPHAE	0	0.00%	1	0.37%	1	0.37%
38	N.A (Blanks)	4	1.48%	14	5.19%	18	6.67%
	Grand Total	91	33.70 %	179	66.30 %	270	100.00 %

Table:4. (a) Grouping of SERUM FERRITIN LEVELS:

S. No.	(Class Interval) SERUM FERRITIN LEVELS	Female		Male		TOTAL	
		Num ber	%	Num ber	%	Num ber	%
1	51-151	4	1.48%	2	0.74%	6	2.22%

2	151-251	73	27.04%	141	52.22%	214	79.26 %
3	251-351	12	4.44%	35	12.96%	47	17.41 %
4	351-451	2	0.74%	0	0.00%	2	0.74%
5	651-751	0	0.00%	1	0.37%	1	0.37%
	Grand Total	91	33.70%	179	66.30%	270	100.00 %

Table: 4. Gender wise SERUM FERRITIN LEVELS:

Sl.No	SERUM FERRITIN LEVELS	Female	Male	Grand Total
1	51	1		1
2	139	1		1
3	150	2	2	4
4	155	1		1
5	158		1	1
6	159		1	1
7	160	1		1
8	161		1	1
9	165	1	2	3
10	166		1	1
11	167	1	1	2
12	168		1	1
13	170		1	1
14	180		10	10
15	184		1	1
16	185		10	10
17	187		1	1
18	188	1		1
19	189	1		1
20	190	6	2	8
21	195	5	4	9
22	196	1	1	2
23	198		1	1
24	199		1	1
25	200	33	49	82
26	201		3	3
27	205		1	1
28	206		1	1
29	210	2	2	4
30	220	1		1
31	230	1		1
32	240		1	1
33	250	18	44	62
34	255		1	1
35	260	1	7	8
36	265	6	7	13
37	266		1	1
38	270		5	5
39	280	2	4	6
40	285	2	4	6
41	295		4	4
42	304		1	1
43	305	1		1
44	325		1	1
45	354	1		1
46	377	1		1
47	695.69		1	1
	Grand Total	91	179	270

Table: 5. Gender wise CRP findings

Sl.No	CRP	Female	Male	Total
1	4.1	1	0	1
2	195.62	0	1	1
3	278.5	0	1	1
4	278.50 ng/dl	1		1
5	329.36 ng/dl	0	1	1
6	406 mg/dl	1		1
7	481.83 ng/dl	0	1	1
8	6.72mg/ml	0	1	1
9	655 ng/dl	0	1	1
10	893.05 ng/dl	0	1	1

11	blanks (Data N.A)	88	172	260
	Grand Total	91	179	270

Table: 6. Gender wise CT/MRI findings:

Sl.No.	CT/MRI FINDINGS	F	M	T
1	ANT ETHMOIDAL SINUSITIS	1		1
2	B/L ANT ETHMOIDAL MAXILLARY FRONTAL SINUSITIS		1	1
3	B/L ETHMOIDAL , SPHENOIDAL SINUSITIS	1		1
4	B/L ETHMOIDAL MAXILLARY SINUSITIS EXTENDED INTO PTERYGOPALATINE INTRA ORBITAL FOSSA, FRONTAL SINUSITIS		1	1
5	B/L ETHMOIDAL, LEFT SPHENOIDAL SINUSITIS		1	1
6	B/L MAXILLARY EHTMOIDAL, SPHENOIDAL SINUSITIS	1	2	3
7	B/L MAXILLARY ETHMOIDAL , FRONTAL SINUSITIS	1		1
8	B/L MAXILLARY ETHMOIDAL FRONTAL SINUSITIS		1	1
9	B/L MAXILLARY ETHMOIDAL FRONTAL SINUSITIS,B/L ORBITAL CELLULITIS		1	1
10	B/L MAXILLARY ETHMOIDAL LEFT FRONTAL SINUSITIS	1		1
11	B/L MAXILLARY ETHMOIDAL LEFT FRONTAL SINUSITIS, FUNGAL SINUSITIS		1	1
12	B/L MAXILLARY ETHMOIDAL SINUSITIS	1	1	2
13	B/L MAXILLARY ETHMOIDAL SINUSITIS INVOLVEMENT		1	1
14	B/L MAXILLARY ETHMOIDAL SPHENOIDAL SINUSITIS	1	1	2
15	B/L MAXILLARY ETHMOIDAL, LEFT FRONTAL SPHENOID SINUSITIS		1	1
16	B/L MAXILLARY ETHMOIDAL, SPHENOIDAL RT FRONTAL SINUSITIS	1		1
17	B/L MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS		2	2
18	B/L MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS, LEFT ORBITAL CELLULITIS		1	1
19	B/L MAXILLARY FRONTAL SPHENOIDAL SINUSITIS		1	1
20	B/L MAXILLARY FRONTAL, RIGHT ANT ETHMOIDAL SINUSITIS	1		1
21	B/L MAXILLARY LEFT ETHMOIDAL FRONTAL SPHENOIDAL SINUSITIS,	1		1
22	B/L MAXILLARY LEFT ETHMOIDAL SPHENOIDAL SINUSITIS, LEFT ORBITAL CELLULITIS	1		1
23	B/L MAXILLARY RIGHT ETHMOIDAL SINUSITIS	1		1
24	B/L MAXILLARY SINUSITIS		1	1
25	B/L MAXILLARY SPHENOIDAL SINUSITIS, BONY EROSIONS IN MAXILLA, ILLDEFINED SOFT TISSUE INJURY. RIGHT ORBITAL CELLULITIS ALONG WITH RIGHT EYE PROPTOSIS		1	1
26	B/L MAXILLARY SPHENOIDAL, ETHMOIDAL SINUSITIS		1	1
27	B/L MAXILLARY SPHENOIDAL, ETHMOIDAL SINUSITIS		2	2
28	B/L MAXILLARY SPHENOIDAL, ETHMOIDAL SINUSITIS (FUNGAL SINUSITIS)		1	1

29	B/L MAXILLARY, ETHMOIDAL SINUSITIS WITH CORTICAL EROSION -LT ORBITAL CELLULITIS		1	1
30	B/L MAXILLARY ETHMOIDAL, SPHENOID SINUSITIS		1	1
31	B/L PAN SINUSITIS	1	2	3
32	B/L-FRONTAL ETHMOIDAL SPHENOIDAL & MAXILLARY SINUSITIS,- ORBITAL CELLULITIS IS SEEN	1		1
33	B/L-MAXILLARY & ETHMOIDAL & SPENOIDAL SINUSITIS		1	1
34	B/L-MAXILLARY, FRONTAL & ETHMOIDAL SINUSITIS,MILD DEVIATION OF NASAL SEPTUM TO RIGHT		1	1
35	B/L-MAXILLARY,ETHMOIDAL & SPHENOIDAL SINUSITIS-LEFT ORBITAL CELLULITIS		1	1
36	BILATED MAXILLARYYY ETHMOIDALS, SPHEROID SINUSITIS CT ORBITAL CELLULITIS		1	1
37	BILATERAL FRONTAL SINUSITIS	1		1
38	BILATERAL MAXILLARY ETHMOIDAL SPHENOIDAL SINUSITIS	1	3	4
39	BILATERAL MAXILLARY FRONTAL EHTMOID SINUSITIS, CORTICAL EROSION IN MAXILLARY BONE, RIGHT ORBITAL CELLULITIS		1	1
40	BILATERAL MAXILLARY RIGHT ETHMOIDAL FRONTAL SPHENOIDAL SINUSITIS, RIGHT ORBITAL CELLULITIS		2	2
41	BILATERAL MAXILLARY SINUSITIS	2		2
42	BILATERAL MAXILLARY SPHENOID SINUSITIS	1		1
43	BILATERAL PAN SINUSITIS ORBITAL CELLULITIS	1		1
44	BILATERAL PAN SINUSITIS RIGHT ORBITAL CELLULITIS	1		1
45	BILATERAL SPHENOID LEFT ETHMOIDAL SINUSITIS	1		1
46	BILATERAL MAXILLARY SINUSITIS	1		1
47	BLACK ESCHAR FOUND IN INFUNDIBULUM AND BULLAE AND UNCINATE PROCESS		1	1
48	CALCIFIED GRANULOMA IN LEFT PARIETAL REGION, LEFT ORBITAL CELLULITIS		1	1
49	CHRONIC SPHENOIDAL SINUSITIS	1		1
50	CT- B/L MAXILLARY AND SPHENOID SINUSITIS	1		1
51	CT B/L MAXILLARY ETHMOIDAL SINUSITIS LT ORBITAL CELLULITIS	1		1
52	CT- BILATERAL PARANASAL SINUSITIS RIGHT MAXILECTOMY DONE		1	1
53	CT MUCOSAL THICKENING OF B/L MAXILLARY ETHMOIDAL AND SPHENOID SINUSITIS- MILD DEVIATION OF NS		1	1
54	CT- PAN SINUSITIS MILD DEVIATION OF NASAL SEPTUM TOWARDS LEFT		1	1
55	CT- PAN SINUSITIS RIGHT ORBITAL CELLULITIS	1		1
56	CT- PNS BILATERAL MAXILLARY SINUSITIS	1		1

57	CT PNS INVASIVE FUNGAL SINUSITIS LT ORBITAL CELLULITIS BILATERAL MAXILLARY SPHENOID LEFT ETHMOIDAL LEFT FRONTAL SINUSITIS	1		1	88	LEFT MAXILLARY ETHMOIDAL SINUSITIS, LEFT ORBITAL CELLULITIS		1	1
58	CT- PNS, PAN SINUSITIS		1	1	89	LEFT MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS		1	1
59	CT- RIGHT MAXILLARY SINUSITIS		1	1	90	LEFT MAXILLARY FRONTAL, LESION	1		1
60	CT-MILD LEFT DNS B/L MAXILLARY ETHMOIDAL AND SPHENOID SINUSITIS- RIGHT ORBITAL CELLULITIS		1	1	91	LEFT MAXILLARY SINUSITIS		1	1
61	CT-PAN SINUSITIS FUNGAL DEBRIS FROM MAXILLARY ANTRUM		1	1	92	LEFT MAXILLARY SINUSITIS ETHMOIDAL SINUSITIS		1	1
62	CT-PAN SINUSITIS LEFT ORBITAL CELLULITIS		1	1	93	LEFT MAXILLARY SINUSITIS, MILD LEFT DNS		1	1
63	CT-PNS BILATERAL MAXILLARY ETHMOIDAL AND SPHENOID SINUSITIS RIGHT ORBITAL CELLULITIS	1		1	94	LEFT MAXILLARY, RIGHT ETHMOIDAL, RIGHT ORBITAL CELLULITIS		1	1
64	CT-PNS LEFT MAXILLARY ETHMOIDAL SINUSITIS OEDEMA IN SOFT TISSUES	1		1	95	LEFT MAXILLARY,ETHMOIDAL FRONTAL SINUSITIS	1		1
65	CT-PNS- RIGHT ORBITAL CELLULITIS, PAN SINUSITIS		1	1	96	LEFT MAXILLARY,ETHMOIDAL FRONTAL SPHENOIDAL SINUSITIS	1		1
66	CT-PNS, CHRONIC RIGHT MAXILLARY SINUSITIS LEFT DNS	1		1	97	LEFT ORBITAL CELLULITIS ALONG WITH BONY EROSIONS, MAXILLARY SINUSITIS	1		1
67	CT-PNS, PAN SINUSITIS LEFT ORBITAL CELLULITIS, FUNGAL DEBRIS SUCTIONED FROM LEFT MAXILLARY ANTRUM		1	1	98	LEFT ORBITAL CELLULITIS ALONG WITH LEFT EYE BALL PROPTOSIS, LEFT MAXILLARY ETHMOIDAL SINUSITIS	1		1
68	CT-PNS, PAN SINUSITIS ORBITAL CELLULITIS MAXILLARY INVOLVEMENT		1	1	99	LEFT ORBITAL CELLULITIS CHRONIC SPHENOIDAL, LEFT ETHMOIDAL SINUSITIS		1	1
69	CT-PNS-ANT ETHMOIDAL SINUSITIS,& SPHENOIDAL SINUSITIS		1	1	100	LEFT ORBITAL CELLULITIS, CT-WELL DEFINED HYPODENSE AREA NOTED IN LEFT FRONTAL AREA/LOBE MUCOSAL THICKENINGS IN ALL PNS		1	1
70	CT-PNS-DNS RIGHT, LEFT MAXILLARY ETHMOIDAL FRONTAL & SPHENOID SINUSITIS		1	1	101	LEFT ORBITAL CELLULITIS, MAXILLARY, ETHMOID, SPHENOID		1	1
71	CT-PNS-LEFT MAXILLARY ETHMOIDAL FRONTAL & SPHENOID SINUSITIS		1	1	102	LEFT ORBITAL SINUSITIS		1	1
72	Details not found	6	1	1	103	LEFT PAN SINUSITIS, LEFT ORBITAL CELLULITIS	2	6	8
73	DNS+ PRESENT, BILATERAL MAXILLARY, FRONTAL AND OSTIAL RECESSES BONY EROSION SEEN IN B/L MAXILLARY SINUSES	1		1	104	LEFT -PAN SINUSITIS, LEFT ORBITAL CELLULITIS		1	1
74	ETHMOIDAL FRONTAL SINUSITIS	1		1	105	MAXILLARY RT ETHMOIDAL AND SPHENOIDAL SINUSITIS		1	1
75	ETHMOIDAL SINUSITIS		4	4	106	MAXILLARY EHTMOIDAL SINUSITIS INVOLVEMENT		1	1
76	ETHMOIDAL, MAXILLARY SINUSITIS		1	1	107	MAXILLARY ETHMOIDAL SINUSITIS		2	2
77	ETHMOIDAL, SPHENOIDAL SINUSITIS INVOLVEMENT	1	1	2	108	MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS	2		2
78	FUNGAL SINUSITIS		1	1	109	MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS		1	1
79	INVASIVE SINUSITIS (MRI) MAXILLARY SINUSITIS		1	1	110	MAXILLARY SINUSITIS	2	3	5
80	KOH MOUNT BROAD AND SEPTATE HYPHAE SEEN SUGGESTIVE OF MUCORMYCOSIS		1	1	111	MAXILLARY SINUSITIS & ETHMOIDAL SINUSITIS INVOLVEMENT		1	1
81	LAMA	2	4	6	112	MAXILLARY SINUSITIS INVOLVEMENT		1	1
82	LEFT ANT ETHMOIDAL SINUSITIS	1		1	113	MAXILLARY SPHENOIDAL FRONTAL SINUSITIS INVOLVEMENT	1		1
83	LEFT MAXILLARY AND ETHMOIDAL SINUSITIS		1	1	114	MAXILLARY SPHENOIDAL, ETHMOIDAL SINUSITIS		2	2
84	LEFT MAXILLARY ETHMOIDAL, SPHENOIDAL SINUSITIS	1		1	115	MAXILLARY SPHENOIDAL, ETHMOIDAL SINUSITIS, RIGHT ORBITAL OEDEMA	1		1
85	LEFT MAXILLARY ETHMOIDAL FRONTAL AND SPHENOIDAL SINUSITIS SOFT TISSUE IN OEDEMA LEFT CHEEK	1		1	116	MILD DEVIATION OF NASAL SEPTUM TO RIGHT PAN SINUSITIS SOFT TISSUE OEDEMA IN LEFT CHEEK	1		1
86	LEFT MAXILLARY ETHMOIDAL FRONTAL SINUSITIS		1	1					
87	LEFT MAXILLARY ETHMOIDAL SINUSITIS		2	2					

117	MILD MUCOSAL EDEMA, MAXILLARY EROSION, RIGHT ORBITAL ABCESS PTOSIS, ETHMOIDAL SINUSITIS		1	1	145	PAN SINUSITIS, BONY EROSIONS AND DESTRUCTIONS, RIGHT ORBITAL CELLULITIS	1		1
118	MILD RIGHT DNS, LEFT MAXILLARY, ETHMOIDAL, FRONTAL AND SPHENOID SINUSITIS		1	1	146	PAN SINUSITIS, BILATERAL MMA ETHMOIDAL	1		1
119	MINIMAL PAN SINUSITIS	1		1	147	PAN SINUSITIS, BOTH EYES ORBITAL CELLULITIS	1	1	2
120	MINIMAL RIGHT ORBITAL CELLULITIS, PAN SINUSITIS		1	1	148	PAN SINUSITIS, DEVIATED SEPTUM, ORBITAL CELLULITIS		1	1
121	MRI- BILATERAL MAXILLARY SINUSITIS, CT-MAXLLARY ETHMOIDAL SPHENOID SINUSITIS		1	1	149	PAN SINUSITIS, FRONTAL LOBE FUNGAL GRANULOMA, ORBITAL CELLULITIS		1	1
122	MRI- BRAIN MUCOSAL THICKENING OF BILATERAL MAXILLARY SPHENOID ETHMOIDAL SINUSITIS ORBITAL SWELLING		1	1	150	PAN SINUSITIS, LEFT ORBITAL CELLULITIS		2	2
123	MRI- LEFT MAXILLARY MUCORMYCOSIS ETHMOIDAL AND NECROTIC DEBRIS SEEN		1	1	151	PAN SINUSITIS, LEFT ORBITAL CELLULITIS, LEFT DNS	1		1
124	MRI- LT MAXILLARY, ETHMOIDAL AND SPHENOIDAL SINUSITIS		1	1	152	PAN SINUSITIS, PRE MAXILLARY, RETRO MAXILLARY, PTSOIS OF ORBITAL		1	1
125	MRI-LEFT DNS MUCOSAL THICKENING OF B/L ETHMOIDAL LEFT FRONTAL LEFT SPHENOIDAL AND LEFT MAXILLARY SINUSITIS	1		1	153	PAN SINUSITIS, RIGHT ORBITAL AND PERI ORBITAL CELLULITIS		1	1
126	MUCOSAL THICKENING OF LT MAXILLARY, ETHMOIDAL AND SPHENOID SINUSITIS- SOFT TISSUE EDEMA OF PRE-MAXILLARY AREA	1		1	154	PAN SINUSITIS, RIGHT ORBITAL CELLULITIS		3	3
127	NASO ORBITAL CEREBRAL, FRONTAL, ORBIT, LEFT FRONTAL LOBE MENINGES, MAXILLARY ANTRUM EROSION FRONTAL SINUSITIS		1	1	155	PAN SINUSITIS, RT ORBITAL CELLULITIS MILD DEVIATION OF NASAL SEPTUM		1	1
128	NECROTIC MATERIAL REMOVED FROM ANT, POST ETHMOIDAL AND MAXILLARY ANTRUM		1	1	156	PNS BILATERAL MAXILLARY ETHMOIDAL LEFT FRONTAL & SPHENOID SUNUSITIS		1	1
129	ORBITAL CELLULITIS		1	1	157	PNS- NORMAL, SEPTUM DEVIATION	1		1
130	ORBITAL CELLULITIS, MAXILLARY EROSION FRONTAL		1	1	158	PROPTOSIS , CT-LEFT MAXILLARY FRONTAL BILATERAL ETHMOIDAL SHENOID SINUSITIS	1		1
131	PALATE NECROSIS	1		1	159	PULMONARY MUCORMYCOSIS	1		1
132	PAN SINUSITIS		1	1	160	R/T MAXILLARY, ETHMOIDAL AND SPHENOID SINUSITIS RIGHT ORBITAL CELLULITIS		1	1
133	PAN SINUSITIES, RIGHT ORBITAL CELLULITIS		1	1	161	RIGHT ETHMOIDAL FRONTAL SINUSITIS WITH RIGHT ORBITAL CELLULITIS	1		1
134	PAN SINUSITIS	7	8	15	162	RIGHT ETHMOIDAL, SPHENOIDAL SINUSITIS		1	1
135	PAN SINUSITIS		1	1	163	RIGHT MAXILLARY B/L ETHMOIDAL SPHENOIDAL SINUSITIS	1		1
136	PAN SINUSITIS ALONG WITH ORBITAL CELLULITIS		1	1	164	RIGHT MAXILLARY ETHMOIDAL , SPHENOIDAL, LEFT FRONTAL SINUSITIS		1	1
137	PAN SINUSITIS ALONG WITH BONY EROSIONS	1		1	165	RIGHT MAXILLARY ETHMOIDAL SINUSITIS	2	2	4
138	PAN SINUSITIS ALONG WITH ORBITAL CELLULITIS		1	1	166	RIGHT MAXILLARY ETHMOIDAL SINUSITIS AND INVLOVEMENT OF RIGHT PTERYGOPALATINE FOSSA, RIGHT SPHENOIDAL FORAMEN		1	1
139	PAN SINUSITIS AND EDEMA OF RETRO ORBITAL AREA		1	1	167	RIGHT MAXILLARY FUNGAL MATERIAL SEEN, RIGHT MAXILLARY ANTRUM		1	1
140	PAN SINUSITIS BOTH EYES ORBITAL CELLULITIS	2	4	6	168	RIGHT MAXILLARY SINUSITIS	1	1	2
141	PAN SINUSITIS ORBITAL CELLULITIS IN BOTH EYES		1	1	169	RIGHT MAXILLARY SINUSITIS FUNGAL DEBRIS NOTED IN RT MAXILLARY ANTRUM		1	1
142	PAN SINUSITIS RIGHT ORBITAL CELLULITIS		2	2	170	RIGHT MAXILLARY SPHENOIDAL , LEFT SPHENOIDAL SINUSITIS		1	1
143	PAN SINUSITIS WITH BONY EROSIONS		1	1	171	RIGHT MAXILLARY, ETHMOIDAL FRONTAL SINUSITIS, MILD SEPTUM DEVIATION		1	1
144	PAN SINUSITIS WITH ILLDEFINED LESION IN MEDIAL ASPECT OF LEFT ORBIT		1	1	172	RIGHT ORBITAL CELLULITIS, RIGHT PAN SINUSITIS		1	1

173	RIGHT PAN SINUSITIS	1	1	2
174	RIGHT PAN SINUSITIS RIGHT ORBITAL CELLULITIS	1		1
175	RIGHT PAN SINUSITIS, RIGHT MMA DONE	1		1
176	RIGHT PAN SINUSITIS, RIGHT ORBITAL CELLULITIS	1		1
177	RIGHT RHINO ORBITAL MUCORMYCOSIS		1	1
178	RIGHT SPHENOIDAL, ETHMOIDAL INVASIVE SINUSITIS	1		1
179	RT ETHMOIDAL & SPHENOID SINUSITIS -MILD DNS TO LEFT SIDE		1	1
180	RT MAXILLARY ETHMOIDAL AND FRONTAL SPHENOIDAL SINUSITIS	1		1
181	RT MAXILLARY ETHMOIDAL, FRONT SINUSITIS, RT POST NASAL POLYP	1		1
182	RT MAXILLARY ETHMOIDAL, FRONT SPHENOIDAL SINUSITIS	1		1
183	RT MAXILLARY POLYP		1	1
184	RT MAXILLARY SINUSITIS NO EVIDENCE OF FUNGAL SINUSITIS		1	1
185	RT MAXILLARY,FRONTAL,B/L ETHMOIDAL & SPHENOIDAL SINUSITIS	1		1
186	SPHENOID SINUSITIS	1		1
187	SPHENOID, RIGHT ETHMOIDAL SINUSITIS		1	1
188	THICK DEBRIS IN RIGHT MAXILLARY SINUS		1	1
	Grand Total	9	1	2
		1	7	7
			9	0

Table: 7. Gender wise operation procedure:

S.No.	OPERATION PROCEDURE	Female		Male		TOTAL	
		Number	%	Number	%	Number	%
1	ENDOSCOPIC DEBRIDEMENT	91	33.83%	177	65.80%	268	99.63%
2	ENDOSCOPIC DEBRIDEMENT ON BOTH SIDES	0	0.00%	1	0.37%	1	0.37%
	Grand Total	91	33.83%	178	66.17%	269	100.00%

Results ;

Maximum no of pts of mucor mycosis belongs 40-60 (58.52%)yrs ,most of the cases are diabetics (17.04%), hypertensives(0.37%), followed by HIV (0.37%), dialysis pts (0.37%), elderly pts, and most of the cases are not vaccinated(99.63%), early intervention prevented the mortality and morbity. the mean duration is 12 months . clinical examination shows facial edema, orbital edema, ptosis, necrosis, eschar, cranial nerve paralysis, CVA, brainabscess, palate perforation, MRI shows most of the cases are unilateral, Maxillary sinusitis involvement is more followed by ethmoid, frontal, sphenoid, pan sinusitis also noted bilateral involvement .. these cases are subjected to thorough debridement of sinuses collected material send to microbiology shows 100 percent of zygomycosis, followed by mucor, Rhizopus(40%-50%),Cunninghamella,Lichtheimia (formerly Absidia)

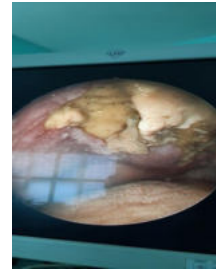
These cases post operatively given Inj Amphotericin B for 4 weeks followed by inj. Posaconazole for one week arrested the progress of the disease, and reduced the mortality morbidity.

Conclusion ;

Mucor mycosis is seen in large number of cases with second covid virus infection with Delta variant and most of the cases reported are not vaccinated (99.6%),elderly pts (58.52%) ,Diabetics(17.04%), and seen in these cases with high serum ferritin levels which is end product of cytokine storm. This fungus is aseptate,which spreads rapidly with in 24 hrs to the surrounding structures causing endarteritis ,ischemia

,necrosis which typically producing black crust eschar- Black fungus.. with early surgical intervention by doing debridement of the sinuses and widening of these sinuses allows much ventilation and frequent douching of the sinuses prevented the spread of the fungus to the intracranial spread with adequate dosage of amphotericin B and Posaconazole. And with control of comorbid conditions these cases are treated effectively .

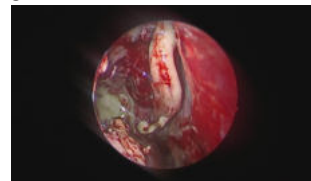
Mucormycosis on KOH mount showing fruiting of the sporangia, rupture and releasing spores



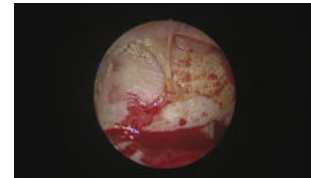
Extensive necrosis of palate



Patient showing Ptosis and Orbital Cellulitis



Wide middle meatal Antrostomy



Fungal spores seen on the inner table of Frontal sinus along with granulations



Drainage of Brain Abscess



Extensive involvement of maxilla



Involvement of maxilla and Hard palate, teeth and alveolus



Endoscopic Picture showing Eschar

