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Study Of Eyelid Sparing Orbital Exenteration: Our Experience In Rhino Orbital Cerebral Mucormycosis.

Abhijeet Dhavale¹, Dnyanoba Darade², Romik Sorum³, and Kaumudi Bihani^{4*}.

¹Assistant Professor, Department of Ophthalmology, Rajarshi Chhatrapati Shahu Maharaj Government Medical College, Kolhapur, Maharashtra, India.

²Head of Department and Professor, Department of Ophthalmology, Rajarshi Chhatrapati Shahu Maharaj Government Medical College, Kolhapur, Maharashtra, India.

³Junior resident, Department of Ophthalmology, Rajarshi Chhatrapati Shahu Maharaj Government Medical College, Kolhapur, Maharashtra, India.

⁴Senior resident, Department of Ophthalmology, Rajarshi Chhatrapati Shahu Maharaj Government Medical College, Kolhapur, Maharashtra, India.

ABSTRACT

This is a case series conducted in a tertiary care center over 4 months on 11 patients diagnosed with rhino-orbital-cerebral mucormycosis to describe the eyelid-sparing orbital exenteration technique and its outcome. The scoring system was applied on 11 patients including with one bilateral involvement. Patients who crossed a score of 25 underwent eyelid-sparing orbital exenteration. Total 12 eyelid-sparing orbital exenterations were performed. There was a male predisposition (83.33%). Majority (75%) were above 60 years of age. Post exenteration 2(16.66%) had recurrence. Clinically few intraoperative complications like excessive bleeding and postoperative complications like suture abscess, wound dehiscence and orbital abscess were noted. One death was observed with the patient who underwent bilateral exenteration. Eyelid sparing exenteration technique has better clinical, functional and cosmetic outcome as patient can undergo orbital rehabilitation in the form of a prosthesis or patch.

Keywords: Rhino-orbital-cerebral mucormycosis, Eyelid-sparing orbital exenteration, complications, outcome

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**Corresponding author*

INTRODUCTION

In India prevalence is nearly 80 times (140 cases per million) higher compared to developed countries [1]. Common presentation is rhino-orbital-cerebral, found in 45–74%, the orbit being involved in the retro-bulbar space through the maxillary or ethmoid Sinuses [2]. Patients presented with features like headache, pain, ophthalmoplegia, ptosis, proptosis, and eventual blindness. Worldwide fatality is 46%, but with an intracranial involvement or an orbital involvement increases the fatality rate to as high as 50% to 80% [5]. Early diagnosis and early initiation of multidisciplinary treatments by medical and surgical methods can be life saving for these patients.

Orbital exenteration is mainly indicated in cases of malignancy to remove a tumour completely and to increase survival [6]. It is also occasionally indicated for Benign progressive disease such as orbital mucormycosis [7]. Total exenteration is removal of all the orbital contents and eyelids completely. Subtotal exenteration includes leaving behind some portion of the posterior orbital soft tissues. Extended exenteration includes removal of bone or adjacent structures. Traditionally, partial excision of the lids is usually performed as part of the procedure for better exposure and to avoid devascularisation of the lids[8]. However mucormycosis is a non-malignant disease and sparing the lids is justified under the cover of injectable amphotericin B intravenously if there is no gross involvement.

METHODS AND MATERIALS

This is a case series of 11 patients (one had bilateral involvement) with Covid-19 associated with rhino-orbital cerebral mucormycosis, managed in our tertiary care centre from April 2021 to July 2021. Routine history taking, clinical examination, B scan and diagnostic Nasal endoscopy were performed in all the patients. Radiological investigation like CT PNS was performed in all the patients and MRI Brain with orbit was done in patients with clinical suspicion of intracranial or intra-orbital spread of the disease. Direct and Indirect Ophthalmoscopy was performed in all the patients. Medical treatment, injection Amphotericin-B intravenously and tablet Posaconazole orally was given. Surgical debridement from the nasal or paranasal or oral region was done. The scoring system was applied on the patients. Depending on the score orbital exenteration was carried out. Repeat nasal endoscopy was done. Along with it tissue from the suspected area was sent for microscopic examination on KOH mount. If found negative patients were then discharged and followed up on OPD basis.

We used SION hospital scoring system which was based on 3 main criteria,

- Clinical signs and symptoms
- Direct and Indirect Ophthalmoscopy
- Imaging [15].

MANAGEMENT AND RESULTS

Amongst all the patients visited our hospital with mucormycosis in the duration of 4 months, based on the scoring system it was observed that total 11 patients (one with bilateral involvement) who crossed a score of 25 were eligible candidates for orbital exenteration as agreed upon by the Otorhinolaryngologists and Ophthalmologists. Total 12 exenterations were performed in 11 patients. General anaesthesia was given to the patient. A 4-0 black silk suture was passed through the skin, orbicularis muscle and superficial tarsus of the upper and lower lid. It was tied together to close the eyelids and provide traction during the procedure (Figure1). A skin incision was made 2mm above the upper eyelid margin and below the lower eyelid margin. Incision was extended up to the medial and lateral canthi. The incision was made through the skin and orbicularis oculi muscle which is then undermined superiorly and inferiorly to expose periosteum above orbital rim. An incision was then made through the periosteum about 2 mm outside of the orbital rim to expose the underlying bone. The periosteum is freed from 360° around the bony orbital margin and into the orbital cavity with the periosteal elevator (Figure2, 3). Small bleeding vessels posteriorly between the periosteum and the bone may get difficult to control.



Figure 1

Figure 2

Figure 3

When the periosteum was freed posteriorly, the enucleation scissors were inserted between the periosteum and bone on the inferonasal side and gently advanced to the orbital apex. The tissue was then cut as near as possible to orbital apex, and the orbital contents were removed by continued traction on the silk sutures in eyelids while cutting the residual adhesions in the posterior orbit (Figure 4, 5). The socket was immediately packed with moist gauze, left in place for 5 - 10 minutes. The gauze was removed and the orbital apex was inspected. Residual soft tissue at the orbital apex was removed (Figure 6). Bovie cautery and packing was done to stop bleeding. The skin sutures were taken (Figure 7). Suture were removed in about 2 weeks, and dressings was not required. The remaining eyelid skin gradually retracts into the socket and provides lining to the socket after exenteration. Thus, an orbital prosthesis can be filled within 3 to 4 weeks.

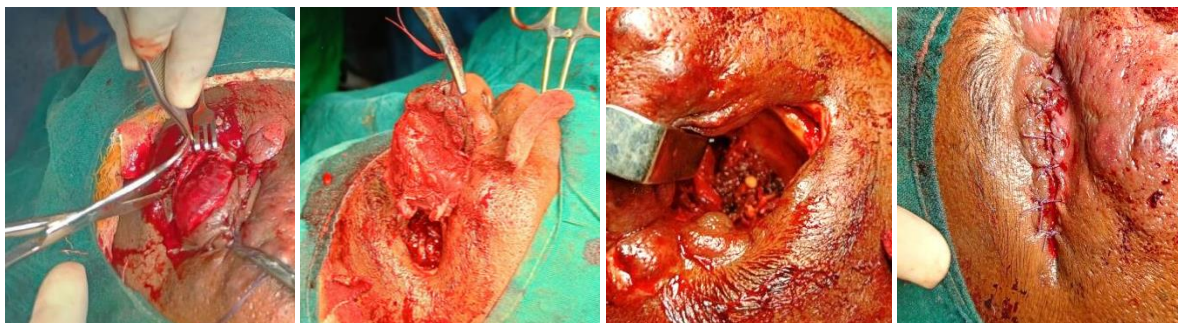


Figure 4

Figure 5

Figure 6

Figure 7

Table 1: Showing the Clinical profile of patients.

Age	Male	Female	TOTAL exenteration	%
0-30 years	0	0	0	0
30-60 years	3	0	3	25
>60 years	6 (one bilateral)	2	9	75

Table 2: Showing Outcome of Surgery

Clinical Outcome

Intra Operative complications	No. Of exenterations	Percentage (%)
Excessive Bleeding	4	33.33%
Fracture	0	0
CSF Leakage	0	0
Post Operative complications	No. Of exenterations	Percentage (%)
Recurrence	2	16.66%
Suture abscess	1	0.08%
Wound Dehiscence	2	16.66%
Orbital abscess/ cellulitis	1	0.08%
Sino Orbital fistula	0	0

Functional Outcome (Rehabilitation)

Most of the patients recovered within 4 weeks of surgery except 2 patients amongst which one death was observed in patient with bilateral orbital exenteration.

Cosmetic Outcome (Readiness for prosthesis)

2 patients underwent successful prosthetic placement.

DISCUSSION

Early diagnosis and early initiation of multidisciplinary treatments by an Otolaryngologist and Ophthalmologist after examining the patient and aggressively approaching by medical and surgical methods can be life saving for these patients. Conventionally performed orbital exenteration partially removes both lids leading to loss of their function and poor cosmetic outcome. Cosmetic rehabilitation in these patients is achieved by a broad rimmed spectacle frame carrying prosthesis or prosthesis attached directly to the cavity with adhesives or osteo-integrated magnetic implants. Cosmetic outcome however is not the mark [7, 9]. Recently, total eyelid preserving orbital apex clearance using an endoscope has been introduced [9, 10]. In a non-malignant disease as mucormycosis, sparing the lids can be justified with adjacent administration of injectable amphotericin B intravenously if there is no gross involvement. A lateral canthotomy incision in eyelid sparing technique can improve the exposure of the fornix, if needed. If the lid complex remains intact, it leads to better aesthetic outcome of the face due to better eye closure and good cosmesis [16, 17].

In our case series we found male predisposition (83.33%) amongst patients being exenterated. Similarly, there was male predominance in studies conducted by Benjamin Cumming et al [13]. and A Martel et al [14]. In our case series exenteration was majorly performed in patients above 60 years of age (75%). Similarly, study conducted by A Martel et al [14] was also mainly performed between 75-79 years of age. Surprisingly Kiratli and coworkers reported a low mean age of 39.4 years in their study [11].

In our series post exenteration, 2(16.66%) patients had recurrence as shown on repeat endoscopic and microscopic examination on KOH mount. Clinically few intraoperative complications like excessive bleeding (33.33%) and postoperative complications like suture abscess (0.08%), wound dehiscence (16.66%) and orbital abscess (0.08%) were noted. Most of the patients recovered within 4 weeks of surgery except 2 patients amongst which one death was observed in patient with bilateral orbital exenteration. 2 patients underwent successful prosthetic placement. Early healing leading to readiness for prosthesis placement and less recurrence was also found in other studies conducted by Shields et al [18] and Agarwal et al [12].

Without eyelid sparing, the orbital cavity has to be covered by temporalis muscle, forehead flaps or grafts. Some surgeons allow spontaneous granulation as this provides comparable cosmetic results. However, healing by granulation requires intensive postoperative care and is time consuming. To address this problem, an eyelid-sparing technique maybe used when possible. A modification of the total exenteration technique which spares parts of both the eyelids, with transverse blepharorrhaphy covers the orbit, thus ensuring better cosmesis and early rehabilitation. More over sparing of the orbicularis muscle gives better vascular supply to the skin flap which helps early wound healing [3, 4, 18].

CONCLUSION

Eyelids are usually excised as part of the exenteration, presumably for better exposure and to avoid devascularisation of the lids. However, sacrificing even part of the lids for non-malignant disease such as orbital mucormycosis is not justified. Moreover, eyelid sparing exenteration technique has better clinical, functional and cosmetic outcome as patient can undergo orbital rehabilitation in the form of a prosthesis or patch.

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