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A Case Series on Evisceration with Mules PMMA Implant

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Abstract: ***Aim: After evisceration in patients with painful blind eye with an end stage eye disease , the efficacy of PMMA implant as a primary orbital reconstruction is evaluated. Methods: 10 eyes of 10 patients who for various reasons got evisceration done and as a primary orbital reconstruction procedure done with MULES PMMA implant are included in the study. Postoperative assessement is done regarding the 1. Volume replacement, 2. Extra ocular Movements, 3. Cosmesis. Results: All the 10 patients got good volume replacement, 8 out of 10 patients got good extra ocular movements and rest of the two patients have got restricted movements post surgery, cosmetically 10 out of 10 patients got good results and are satisified. Conclusion: MULES Implant is definitely a good choice for primary orbital cavity reconstruction after evisceration in view of motility of the eye and cosmesis. Though the more recent biogenic implants are superior to MULES, in view of cost effectiveness and much comparable advantages of MULES IMPLANT make it a definite alternative to biogenic ones for a poor man in a Government hospital setup.***

Keywords: Evisceration, MULES PMMA implant, biogenic implant, volume replacement, primary orbital cavity reconstruction

1. Introduction

The cosmetic results of simple evisceration are frequently poor with the prosthesis giving an immobile staring appearance and tending to cause sagging of the lower lids and production of a deep hollow below the brow. This outcome can be considerably improved by replacing the lost eye with an orbital implant. The first orbital implants developed by Mules in 1885 [1]. Ideally, the purpose of an orbital implant is to provide adequate orbital volume to compensate for the absent globe, promote prosthesis motility, and be responsible for minimal complications following surgery. Common complications that have arisen include exposure, extrusion, infection, inflammation, and migration of the implant within the anophthalmic socket [9].

An ideal intraorbital implant should be very light weight, simple in design and be completely buried within the sclera to eliminate chances of infection. Furthermore it should be chemically inert without any possibility of bio degradation [4]. The PMMA implants are of widespread in use because they are non-irritating, non-allergenic and non-carcinogenic.

1.1 Aims and Objectives

To evaluate the efficacy of PMMA MULES implant after evisceration regarding the aspects of Orbital volume, Ocular movements, Cosmesis, Extrusion rates.

1.2 Methods

10 patients with painful blind eye presented to ophthalmology OPD underwent evisceration with PMMA MULES implant are included in the study.

Inclusion Criteria

Patients with Absolute Glaucoma, Expulsive Hemorrhage due to corneal ulcer perforation,Bleeding Anterior Staphyloma,Panophthalmitis and Trauma are considered for the procedure.

Exclusion Criteria

Patients who are under age < 20yrs and patients with Sympathetic Ophthalmitis, Intraocular malignancies, Deformed orbital cavity, Phthisical eyes without visual potential are excluded for performing the procedure by us.

1.3 Surgical Procedure

Evisceration can be performed using a retrobulbar injection and intravenous sedation. We have performed using retrobulbar injection. Under monitored anesthesia a retrobulbar injection of 1.5 cc of a 50/50 mixture of 1% lidocaine and 0.5% bupivacaine with 1:1,00,000 units of epinephrine is injected to control oozing and provide postoperative pain control. The patient is then prepared and draped. An eyelid speculum is placed and a 360-degree limbal peritomy is performed with blunt-tipped Westcott scissors and small toothed forceps. Using Steven's scissors, the four quadrants between the recti muscles are cleared. This is performed by grasping the edge of conjunctiva and Tenon's capsule, advancing the scissors posteriorly along the sclera to just past the equator and spreading the tissue by opening the scissors.

Approximately 1 to 2 mm posterior to the limbus, a small full-thickness scleral incision is made. Westcott scissors are then used to make a circumferential incision around the globe to remove the cornea. The intraocular contents are then separated from the sclera using an evisceration spoon[fig 1]. Bleeding from the optic nerve or penetrating

vessels can be controlled with gentle bipolar cautery. The pigment is meticulously removed using absolute alcohol on a cotton-tipped applicator. The scleral cavity is then copiously irrigated with antibiotic solution. Windows oriented in an anterior to posterior direction are cut in the sclera in the four quadrants between the recti muscles using scissors [6]. Scissors are then used to make two cuts at the anterior opening of the sclera in an inferior-medial and superior-lateral direction to facilitate implant placement into the sclera. A sphere shaped PMMA implant measuring from 14 to 20 mm is placed into the scleral cavity[fig 2,3]. Redundant sclera is trimmed and the sclera is closed with multiple interrupted 5-0 Mersiline sutures. Tenon's capsule is closed first with multiple interrupted 5-0 Vicryl sutures. The conjunctiva is then closed with a running suture of 7-0 Vicryl [fig 4]. Antibiotic ointment and a conformer are then placed between the eyelids, and the socket is pressure patched for 4 to 7 days. Patients are kept on prophylactic oral antibiotics for the first few days following surgery. After the patch is removed, the patient is asked to apply antibiotic ointment to the socket twice a day for the next 2 to 4 weeks. Continued wear of the conformer is essential to prevent shortening of the conjunctival fornices. The patient is called to opd 6 to 8 weeks after surgery for the prosthesis fitting. As with any monocular patient, glasses should be worn routinely to protect the remaining eye.

Figure 1: Scooping out the intra ocular contents,

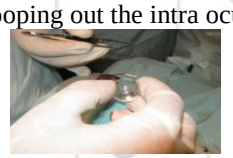

Figure 2: PMMA implant

Figure 3: Placing the implant into the orbital cavity,

Figure 4: Eye after placing the implant and eye sutured

Figure 5: Post operative day 1 picture

Figure showing movements of the eye at 6 months post operative followup. The prosthetic eye is left eye

2. Discussion

Evisceration is the surgical removal of the contents of the eye, leaving the white part of the eye and the eye muscles intact. Removal of an eye may be required following a severe injury, to control pain in a blind eye, to treat some intraocular tumors, to alleviate a severe infection inside the eye, or for cosmetic improvement of a disfigured eye. After evisceration, most of the lost volume is replaced by an implant placed in the eye socket [7]. The implant is a usually a sphere made of silicone rubber, pmma, polyethylene, hydroxyapatite, or alumina, and is covered by the patient's own tissue. Several weeks after surgery, an artificial eye, or prosthesis is placed. The front surface of the artificial eye is custom painted to match the patient's other eye. The back surface is custom molded to fit exactly in the eye socket for maximum comfort and movement [9]. The prosthesis is easily removable, and may be removed as needed for cleaning. This procedure is associated with potential complications and continued follow-up is important as the tissues in the socket may atrophy (shrink) with time [8]. This loss of volume may lead to eyelid laxity or socket changes that may affect the fit of the prosthesis. Careful monitoring of the socket and prosthesis will help keep the socket healthy, and will allow for early detection of any changes that may require further treatment. Short-term risks for this surgery, as with any surgery, include bleeding and infection. Longer-range complications include discharge and socket irritation or exposure of the implant, extrusion, limitation of movements, enophthalmos, ptosis, contraction and lower lid laxity [5]. Almost all complications results from processes interfering with the organisation of the implants by host tissue. The most important step to be taken to avoid complications was to maintain an adequate blood supply at all times. This could not always be achieved particularly when eyes were removed acutely as a result of severe trauma. Early massive exposures were associated with marked tissue swelling in the closed orbital cavity which prevented the covering tissues from healing over the implant. In less extreme situations postoperative tissue swelling was adequately dealt with by careful surgical technique and the administration of non-steroidal anti-inflammatory agents immediately before or during the operation handles the complications [9].

The more recent porous biogenic implants are superior in all aspects like motility, cosmesis, and complications of anophthalmic socket such as enophthalmos, ptosis, contraction, exposure, extrusion, and lower lid laxity are significantly low [5] when compared to other implants because once established fibrous meshwork through the porous channels, the implant stays insitu[2,3]. But considering the Indian economic system and the socio economic status of Indian patients into account and outweighing the comparable advantages of PMMA implant, MULES implant is definitely a poor man's boon after evisceration for a painful blind eye.

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