

Iliac Crest Grafting For Orbital Floor Reconstruction To Rectify Enophthalmos-A Case Report

¹Dr. Rahul Tiwari,²Dr. Philip Mathew,³Dr. Bhaskar Roy, ⁴Dr. Yasmin Jose,
⁵Dr. Kritika Sherawat, ⁶Dr. Kaushal Charan Pahari, ⁷Dr. Heena Tiwari.

¹Fellow in Orthognathic Surgery, Jubilee Mission Medical College Hospital, Thrissur, Kerala.

²HOD, OMFS, Jubilee Mission Medical College Hospital, Thrissur, Kerala, India.

³PG Student, OMFS, KVG Dental College and Hospital, Sullia, DK, Karnataka.

⁴Clinical Observer, OMFS, Jubilee Mission Medical College Hospital, Thrissur, Kerala, India

⁵PG Student, OMFS, Sudha Rustagi Dental College and Research Centre, Faridabad, Haryana.

⁶PG Student, OMFS, Surendra Dental College & RI, Sriganganagar, Rajasthan.

⁷BDS, PGDHHM, Government Dental Surgeon, CHC Makdi, Kondagaon, C.G.

Correspondence Author – Dr. Rahul Tiwari

Abstract: Enophthalmos is a severe complication of inappropriate primary management via reconstruction of zygomaticomaxillary complex fractures including severe injury which require reconstruction of orbital floor. The main goal & objective for secondary reconstruction to correct enophthalmos is function & esthetic. Various treatment modalities are published in literature for achieving symmetric globe position. We here present case report of post traumatic enophthalmos by reconstructing orbital floor using an autogenous iliac crest bone graft. We found it a preferable option for correction to achieve better outcome thereby enhancing quality of life of patients.

Keywords: Orbital floor, fracture, reconstruction, graft, iliac bone.

Date of Submission: 29-05-2018

Date Of Acceptance: 12-06-2018

I. Background:

Orbital wall fracture is a common outcome of orbital injuries. Fracture of orbit leads to various complications primarily like enophthalmos, diplopia, paresthesia of infraorbital nerve & limitation of orbital movement [1,2] Enophthalmos can be traumatic or nontraumatic but to correct enophthalmos we must achieve the correct etiology for proper diagnosis & prompt management. There are various etiological factors which can cause enophthalmos including trauma, reduction in the content of orbital volume, deformity in the orbital bony architecture & orbital fat atrophy. Enormous diagnosis tools are available in the market to diagnoses enophthalmos in which computed tomography scan have won the raccoon section gives the best detailed information about the etiology [3-5] Indications for surgical intervention for correction of enophthalmos are entrapment of inferior rectus muscle which leads to diplopia, fracture which involves more than 50% of orbital floor. Orbital floor fractures still persist a controversial topic in literature & among clinicians. Therefore, four prerequisites for successful repair of orbital complex fracture that includes regional anatomy, accurate diagnosis, unimpeded exposure & fixation of the fracture. The goal of surgery is to reposition the herniated orbital fat & tissues within the orbit & repair of post traumatic defect. [6-8]

II. Case report:

A 17-year-old male patient presented to us with chief complaint of diplopia & perception oh inferior position of globe of right eye. History elicits that he was operated for pan facial trauma of which post traumatic enophthalmos occurred as a complication after 6 months. Reconstruction of the orbital floor with the help of autogenous bone graft under general anesthesia was planned. On exposure orbital floor was herniated which was degloved completely from the floor & lifted up keeping back in correct position. Due to the scarcity of the support by the orbital fat on the floor reconstruction of the orbital floor to prevent the reherniation of the orbital fat was required. Autogenous anterior iliac crest bone graft was harvested from the donor site & a single quadrangular piece of cortical bone was derived [Figure-1]. Closure of the donor site was performed in layers. A spoon was used to restrict the herniation of the fat in the recipient site. The quadrangular piece of harvested bone was reshaped according to the curvature & anatomy to adapt in the proper framework on the orbital floor [Figure-2]. Harvested bone was placed above the orbital floor & spoon was removed. The harvested bone was providing an adequate support to the orbital floor to stay in the required position. Symmetry of the globe was checked after achieving the desired result. Closure was done in layers.

III. Discussion:

Ample of materials are present to reconstruct the orbital floor & keep the repositioned herniated fat in correct position, like several types of autogenous grafts, [9] alloplastic [10-13] implants & allogenic implants. [14-15] This orbital implant ideally should be biocompatible. Autogenous bone grafts are the profound materials of choice to avoid the graft-host reaction but have a drawback of displacement problems, secondary field of surgery, donor site morbidity & unpredictable resorption of graft. Infection, extrusion, tissue reaction, residual diplopia, foreign body reaction is associated with allogenic & alloplastic implants. The rationale of using iliac crest bone graft is its relative resistance to infection, incorporation by the host in the new bone. Lack of host response against the graft & lack of concern for late extrusion. Although there are multiple sites of autogenous grafts, the anterior iliac crest bone remains the most common site & is a favorable reconstructive material as enough bone is always available & also bone can be harvested simultaneously with orbital exploration. It provides the gold standard framework for facial skeleton & orbital wall. [16] Other autogenous grafts are calvarium, tibia, ulnar, mandibular symphysis, ribs, coronoid process & so on. Medpore is also used for the same. [17] The desirable characteristic of a bone grafts is sufficient volume, minimal donor site morbidity, obtaining intramembranous bone with high cortical component, proximity to the residual site, ease of harvesting & achieving of reproducible a good results & minimal resorption rate. [18] Kontio stated that reconstruction of orbital walls with iliac bone grafting is reliable. However, as being a fairly rigid material intraoperative three-dimensional assessment & accurate placement of the bone graft were difficult. The resorption rate was high but most of the resorption was advantageous remodeling so a slight overcorrection is beneficial. [19] Several authors compared to different autogenous grafts for their efficacy in reconstructing orbital floor & reducing the enophthalmos. Membranous & endochondral grafts are compared like cranial & iliac grafts respectively. They were used to correct post traumatic globe position, diplopia & stated that there are no differences in the ability of cranial & iliac crest to correct the post traumatic enophthalmos. [9,18]

IV. Conclusion:

In our case iliac crest graft used to reconstruct the orbital floor here corrected the enophthalmos, diplopia & also restricted ocular movement. The quality of contour of bone is very adaptable & it also provides good amount of corticocancellous bone. It provided good esthetic & functional results. It is preferable & cost-effective modality but accompanies donor site morbidity.

References:

- [1]. Smith B, Regan WF Jr (1957) Blowout fracture of orbit; mechanism and correction of internal orbit fracture. *Am J Ophthalmol* 44(6):733-739
- [2]. Kroll M, Wolper J (1967) Orbital blowout fractures. *Am J Ophthalmol* 64(6):1169-1172
- [3]. Sacks AC, Friedland JA (1979) Orbital floor fractures: should they be explored early? *Plastic Reconstr Surg* 64(2):190-193
- [4]. Roncevic R, Malingier B (1981) Experience with various procedures in the treatment of orbital floor fractures. *J Maxillofac Surg* 9(2):81-84
- [5]. Wolfe SA (1981) Correction of a lower eyelid deformity caused by multiple extrusions of alloplastic orbital floor implants. *Plast Reconstr Surg* 68(3):429-432
- [6]. Rodgers BM, Maher JW, Talbert JL (1981) The use of preserved human dura for closure of abdominal wall and diaphragmatic defects. *Ann Surg* 193(5):606-611
- [7]. Bartkowski SB, Krzystkova KM (1982) Blow-out fracture of the orbit. Diagnostic and therapeutic considerations, and results in 90 patients treated. *J Maxillofac Surg* 10(3):155-164
- [8]. Koornneef L (1982) Current concepts on the management of orbital blowout fractures. *Ann Plast Surg* 9(3):185-200.
- [9]. Mathog RH (1983) Reconstruction of the orbit following trauma. *Otolaryngol Clin North Am* 16(3):585-607
- [10]. Polley JW, Ringle SL (1987) The use of Teflon in orbital floor reconstruction following blunt facial trauma: a 20-year experience. *Plast Reconstr Surg* 79(1):39-43
- [11]. Waite PD, Clanton JT (1988) Orbital floor reconstruction with lyophilized dura. *J Oral Maxillofac Surg* 46(9):727-730
- [12]. Scapini DA, Mathog RH (1989) Repair of orbital floor fractures with Marlex mesh. *Laryngoscope* 99:697-701
- [13]. Sargent LA, Fulks KD (1991) Reconstruction of internal orbital fractures with Vitallium mesh. *Plast Reconstr Surg* 88(1):31-38
- [14]. Bains RA, Rubin PA (1995) Blunt orbital trauma. *Int Ophthalmol Clin* 35(1):37-46
- [15]. Friesenecker J, Dammer R, Moritz M, Niederdelmann H (1995) Long-term results after primary restoration of the orbital floor. *J Craniomaxillofac Surg* 23(1):31-33
- [16]. Lee HH, Alcaraz N, Reino A, Lawson W (1998) Reconstruction of orbital floor fractures with maxillary bone. *Arch Otolaryngol Head Neck Surg* 124(1):56-59
- [17]. Amrani S, Anastassov GE, Montazem AH (2010) Mandibular ramus/coronoid process grafts in maxillofacial reconstructive surgery. *J Oral Maxillofac Surg* 68:641-646
- [18]. Siddique SA, Mathog RH (2002) A comparison of parietal and iliac crest bone grafts for orbital reconstruction. *J Oral Maxillofac Surg* 60:44-50
- [19]. Kontio RK, Laine P, Salo A, Paukku P, Lindqvist C, Suuronen R (2006) Reconstruction of internal orbital wall fracture with iliac crest free bone graft: clinical, computed tomography, and magnetic resonance imaging follow-up study. *Plast Reconstr Surg* 118:1365-1374.

Figure 1: Quadrangular Piece of Iliac Graft

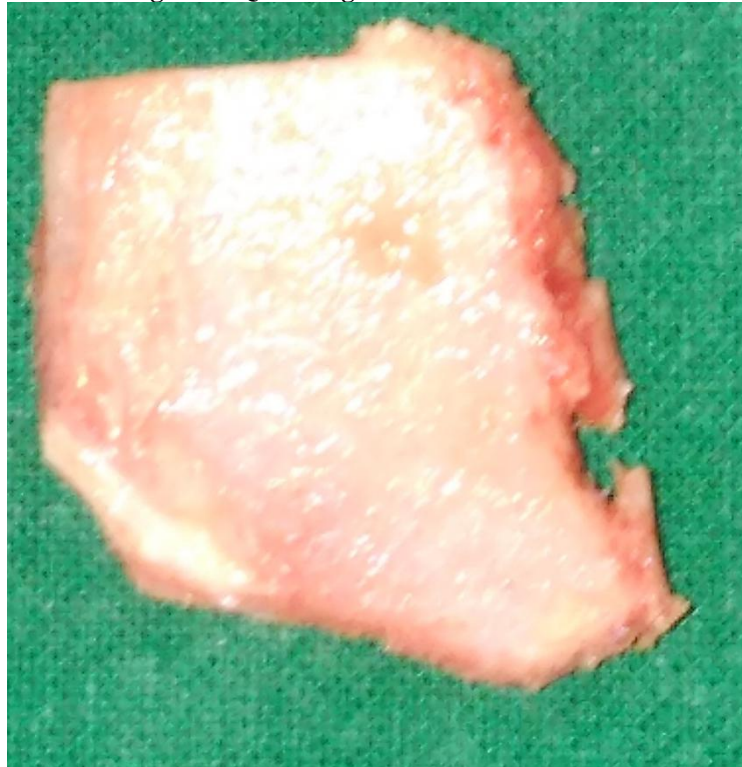
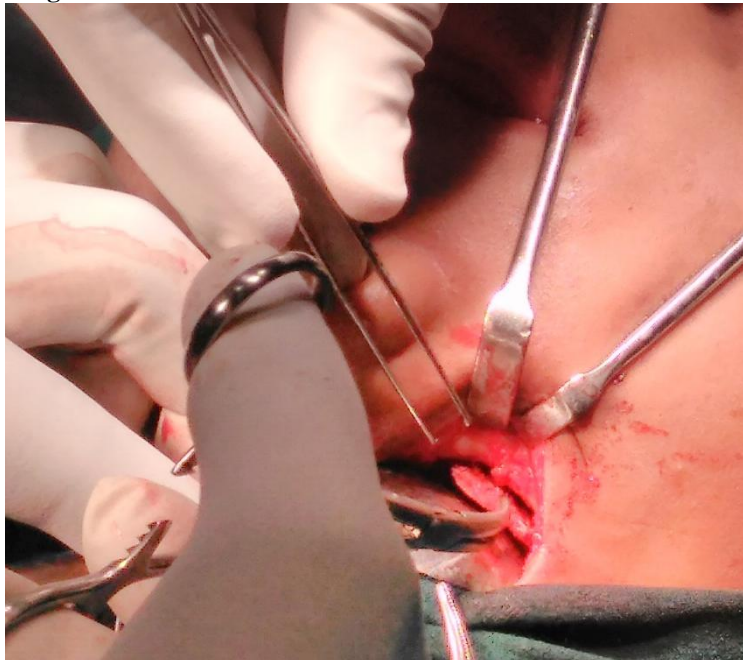


Figure 2: Placement of Graft to Reconstruct the Orbital Floor.



Dr. Rahul Tiwari " Iliac Crest Grafting For Orbital Floor Reconstruction To Rectify Enophthalmos-A Case Report."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 6, 2018, pp 09-11.