

A Clinical Study on Evaluation, Indications, Surgical Techniques and Complications of Various Orbitotomies Done in a Tertiary Care Centre

R. Malarvizhi, K. Vasumathi, A. Anuradha, S. Sheela, A.D. Abinaya

Regional Institute of Ophthalmology & Govt Ophthalmic Institute, Egmore, Chennai, India

Abstract

Objective: To analyse the incidence, indications, various clinical presentations, investigations to localize the lesion, various surgical approaches and complications of orbitotomy.

Study design: Prospective study

Study setting: Department of orbit and oculoplasty in a tertiary care centre (RIO GOH, Chennai) for a period of 6 months.

Materials and methods: Patients with orbital space occupying lesions and hematomas due to trauma were selected. Appropriate clinical examination to quantify the degree of proptosis and radiological investigation to localize the lesion were done. After anaesthetic fitness the patients were taken for orbitotomy under local/general anaesthesia.

Results: In this study most common indication for orbitotomy was dermoid Cyst(50%) followed by blow out fracture (20%). Most common approach in the study was medial approach (46.7%) followed by lateral approach(23.3%). Most of the incisions made were transcutaneous (63.3%) followed by transconjunctival (30%).

Conclusion: Early diagnosis and timely referral to expert orbital surgeon is mandatory for best results. In this study most of the patients had no significant complications. Transconjunctival incision had lesser incidence of postoperative complications and better cosmetic acceptance.

Delhi J Ophthalmol 2020;30;22-26; Doi <http://dx.doi.org/10.7869/djo.521>

Keywords: Dermoid cyst , transconjunctival, orbitotomy.

Introduction

It is a challenge to decide the surgical access to orbit because of the complex anatomy of the orbital structures. Careful planning is required to decide on the ideal approach for a orbital fracture repair or a tumor removal. The surgical approaches in which we access the orbit are anterior orbitotomy, medial orbitotomy and lateral orbitotomy. Lateral orbitotomy through transconjunctival approach is the best approach for the access to the lesions in the lateral orbit and optic nerve as no bone is removed and also in the post-operative period, recovery of the patient is rapid with minimal inflammation or chemosis. This approach is also flexible, permitting the clinician to increase exposure to the orbit per-operatively by swinging the lower lid if required.¹ Anteromedial approach to the orbit provides a wider working space and direct exposure while protecting neurovascular structures. The common indications for this approach are dermoid cysts and cavernous hemangiomas. The procedure has a acceptable cosmetic results as the lateral nasal skin incision healed well. The trans conjunctival and sub ciliary approaches are made in the management of floor fracture of the orbit . This showed excellent results with few complications such as transient entropion in transconjunctival approach and transient ectropion in subciliary approach.²

The type of the incision made for various orbitotomies is determined by the location of the lesion in the orbit. Orbital rim incisions are the Kronlein, direct brow, sub-brow, Lynch

and inferior rim incisions. Other eyelid incisions are sub-ciliary vertical lid-split, sub tarsal and upper lid crease.³ For the medial orbital lesions Lynch incision provides good exposure but the main disadvantage is visible scarring.⁴ The sub-ciliary approach for orbital floor reconstruction allows excellent surgical exposure, but complication includes lower lid retraction.^{5,6} To alleviate the complications associated with cutaneous incisions like disfiguring scars and risk of entropion, the transconjunctival approach is being preferred these days as orbital septum is not involved.⁶ This study describes the various techniques in orbital surgery and the complication rates of each approach.

Subjects and Methods

This is a prospective study conducted at Orbit and Oculoplasty department, RIOGOH, Egmore, Chennai for a period of 6 months (from July 2018 to December 2018). The study was approved by the review board of the institution. Patients having space occupying lesions, vascular lesions,orbital floor fractures requiring orbitotomy were included in the study. Patients with neoplastic lesion with extensive invasion to adjoining structures, neoplastic lesions with distant metastasis and arterio venous malformations were excluded.

The informed written consent of the patient was obtained. Age sex and laterality of the disease were noted. Visual acuity, refraction, examination of the orbit and eyelids, extraocular movements, Hertel's exophthalmometry, forced

duction test and examination of proptosis were done in a detailed manner for every patient. Relevant investigations such as Complete hemogram, Peripheral smear, Thyroid function test, Computed tomography, Magnetic resonance imaging and Ultrasound B- scan of orbit were done. After the orbitotomy the excised lesion was sent for histopathological examination. Data were entered in Microsoft Excel and the frequency of different variables was calculated and analysis was done for the same.

Results

1. Age Distribution

In this study the common age group who underwent orbitotomy is 11-20 yrs (30%), followed by 21- 30 yrs (23.3%). Majority of the cases, 73.3% were below the age of 30.

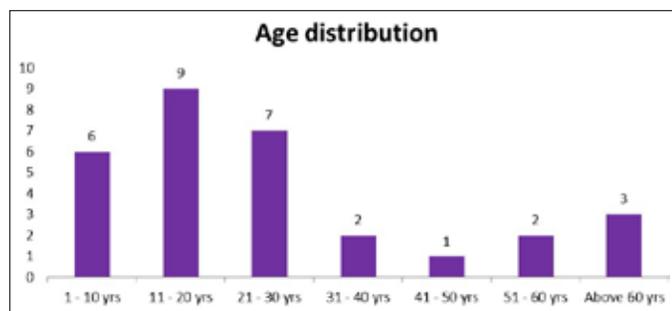


Chart 1: Age distribution in the study group

2. Sex Distribution

Of the patients who underwent orbitotomy majority were males (53%) and females were 47%.

3. Laterality

Right eye was involved in 53% and left eye was affected in the remaining 47%.

4. Presenting Complaints of the Patients

In the study group 63% of the patients presented with swelling, 20% presented with diplopia and 17% presented with proptosis.

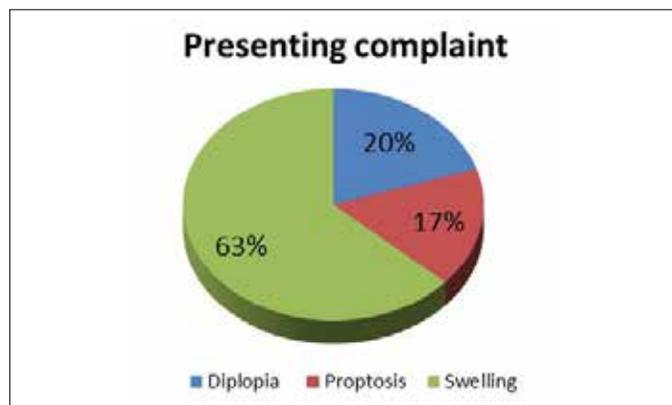


Chart 2: Presenting complaints of the patients

Patients diagnosed to have dermoid, lipoma, hamartoma presented with complaints of swelling. Whereas patients

with blow out fracture complained of diplopia in upgaze. Patients with lymphoma, infective cyst and cavernous hemangioma had complaints of proptosis of the involved eye.

5. Analysis of Investigations

Computed tomography of the orbit was the most common investigation done for the patients in the study group (80%). 1 patient required CT and MRI. In 2 patients CT and biopsy was done. Excision biopsy was also done for hamartoma and infective cyst. CT scan and MRI played a major role in localizing the lesion and planning the approach. Histopathological examination helped in confirmation of diagnosis.

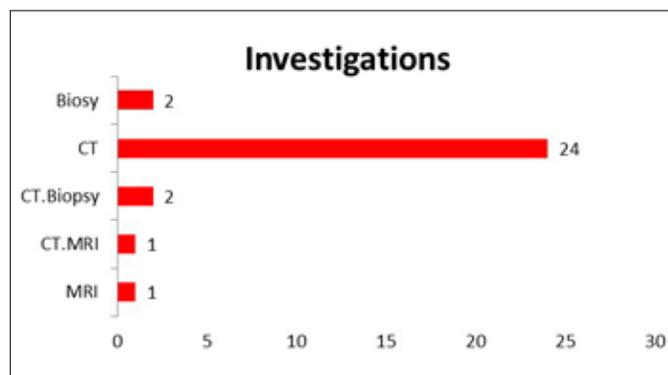


Chart 3: Analysis of investigations done for the patients in the study group

6. Analysis of the Diagnosis

Of the 30 cases who underwent orbitotomy majority of the patients was diagnosed with dermoid cyst (15), most of whom underwent medial orbitotomy. 6 patients underwent inferior orbitotomy for blow out fracture. 3 cases of suspected hemangioma underwent lateral orbitotomy.

Table 1: Analysis of the diagnosis of the patients

Diagnosis	No. of cases	Percentage
Blow out fracture	6	20
Cavernous hemangioma	4	13.3
Dermoid	15	50
Hamartoma	1	3.3
Infective cyst	1	3.3
Lipoma	2	6.7
Retention cyst	1	3.3
Total	30	100

7. Anaesthesia for Orbitotomy

It was found in the study that half of the patients needed general anaesthesia (50%) and another half required local anaesthesia. Paediatric patients, uncooperative patients, prolonged surgeries and deeper lesions were considered for general anaesthesia.

8. Approaches for Orbitotomy

Most (46.7%) of the patients in the study group underwent medial orbitotomy. Second commonly done approach is

lateral orbitotomy. 6 patients underwent inferior orbitotomy for blow out fracture.

Table 2: Analysis of various approaches for the orbitotomy

Approach	No. of cases	Percentage
Anterior orbitotomy	2	6.7
Inferior orbitotomy	6	20
Lateral orbitotomy	7	23.3
Medial orbitotomy	14	46.7
Trans nasal	1	3.3
Total	30	100

9. Analysis of Various Incision Types

In the study group of 30 patients most of the patients were approached for orbitotomy in trans cutaneous route (63.3%). Second common type of incision made was trans conjunctival incision. Subciliary incision was made in 1 blowout fracture patient. Trans nasal endoscopic approach was done for a case of Cavernous hemangioma.

Table 3: Analysis of the various incision types in orbitotomy

Incision type	No. of cases	Percentage
Trans cutaneous	19	63.3
Trans conjunctival	9	30
Sub ciliary	1	3.3
Trans nasal	1	3.3
Total	30	100

10. Analysis of the type of Implants used for Blow Out Fracture Repair:

Of the 6 cases of blow out fracture 2 patients were treated with inferior rectus muscle entrapment release only with no implants as they were trap door fracture in patients of paediatric age group. 2 patients were treated with inferior muscle entrapment release with floor strengthening by auricular cartilage and 2 more with titanium mesh with screws based on their defect type, location and size.

Table 4: Analysis of the type of implants used for blow out fracture

Implant used	No. of cases	Percentage
No. Implant	2	33.3
Auricular cartilage	2	33.3
Titanium mesh with screws	2	33.3
Total	6	100

11. Comparison of Pre Operative and Post Operative EOM

Most of the patients had no EOM dysfunction in the study group pre- operatively. Blow out fracture (20%) had elevation restriction, 1 patient had adduction restriction due to hamartoma in medial canthus and 1 patient had depression restriction due to an infective cyst. Of the total 8 cases with EOM restriction pre operatively only 2 patients had post-operative elevation restriction, both were blow out fractures.

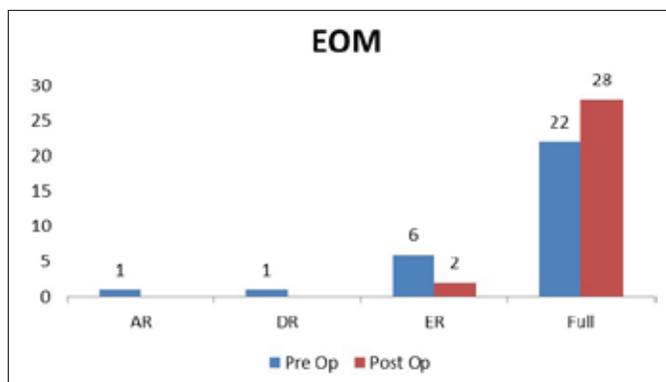


Chart 4: Comparison of pre and post operative EOM

12. Intra Operative Complications

Most of the orbitotomies (90%) done in the study group were uneventful with no intra operative complication. 7% had intra operative hemorrhage while doing orbitotomy for hamartoma and a dermoid. 1 case of blow out fracture had a full thickness button hole in the lower lid during surgery with electro cautery in conjunctival approach

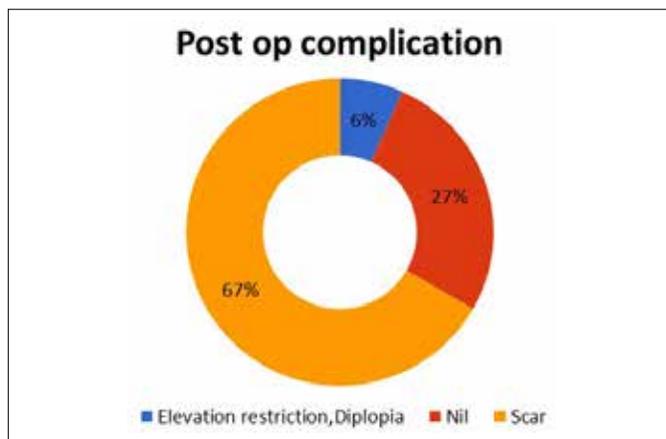


Chart 5: Post operative complications of orbitotomy

13. Post Operative Complications

In the study most common post-operative complication was scar due to trans cutaneous approach of orbitotomy. 2 patients of blow out fracture had residual elevation restriction and diplopia in upgaze. Most of the patients had no significant post op complications. No patient had a drop in vision post operatively.

Discussion

A study conducted by Brett. W. Davies et al on transconjunctival incision discussed the indications and complications of it. They concluded that transconjunctival approach provides good surgical exposure to the inferior orbit. It was also found that this approach is associated with a low complication rate and a better aesthetic outcome than transcutaneous approaches. When combined with a lateral canthotomy there will be wide access to the orbital floor and lateral orbital wall. These results are support our study.⁷ A study was conducted in Guntur medical college on surgical

excision of dermoid by orbitotomy. There were 4 types of orbitotomy done in the study; anterior orbitotomy, lateral orbitotomy, trans frontal orbitotomy and temporofrontal orbitotomy. They concluded that there was no vision threatening complications due to optic nerve damage or lagophthalmos or exposure keratopathy. This also supports



Figure 1: Removal of hemangioma through lateral orbitotomy



Figure 2(a,b): Lateral wall replaced and fixed with screws

our study as there was no complications with dermoids operated in the study.⁸

A retrospective, descriptive study on lateral orbitotomy in which 18 patients were included was conducted and the results were that this approach is a rapid, safe, and minimally disruptive approach for pathology in the lateral orbit and optic nerve. No bone is removed, and in the post-operative period recovery is rapid with minimal inflammation or chemosis. Even in our study, lateral orbitotomy was done for hemangiomas/lymphomas with complete removal of the tumor without need for bone removal and with no significant complication in the post operative period.¹⁰

A study conducted in China by Sun F et al on Surgical treatment of blow out fracture in 52 patients concluded that the diplopia completely disappeared in 18 cases and partly disappeared in 25 cases after operation. Diplopia was still presented in 9 cases post-operatively. There were 4 cases with inferior orbital nerve anesthesia after operation. They concluded that the effect is related to the time of presentation for surgery. Transconjunctival approach has advantages of lesser manipulation, good exposure and no scar. In our study also 2 patients had post operative diplopia as the surgery was done after 2 weeks of trauma.⁹

A study was conducted on purely endoscopic trans nasal removal of cavernous hemangioma in the orbit and they concluded that the endoscopic management of intraconal cavernous haemangiomas is a feasible and safe alternative. We have also reported a case of cavernous hemangioma managed via trans nasal endoscopic approach where complete resection of tumor with no complication was possible.¹¹

The analysis included the indications, approaches, incisions and complications of orbitotomy. The findings of the analysis are as follows:

Of the 30 cases who underwent orbitotomy majority of the patients were diagnosed with dermoid cyst (15), most of whom underwent medial orbitotomy.

6 patients underwent inferior orbitotomy for blow out fracture. 3 cases of suspected hemangioma underwent lateral orbitotomy. Most (46.7%) of the patients in the study group underwent medial orbitotomy. Second commonly done orbitotomy is lateral orbitotomy.

Most common post-operative complication was scar due to trans cutaneous approach of orbitotomy. 2 patients of blow out fracture had residual elevation restriction and diplopia in upgaze. Most of the patients had no significant post op complications. 66.6% had a vision of 6/6 in both eyes. 3 patients had 6/12 vision in both eyes. No patient had a drop in vision post operatively.

Conclusion

Early diagnosis and timely referral to tertiary care center is mandatory. Detailed examination with appropriate investigations to localize the lesion and decision making on the correct approach to reach the site of lesion is required. CT helps refine the differential diagnosis and guide the selection of the surgical approach by showing the relationship of the lesion to the surgical space or spaces of the orbit. Gentle handling of tissues intraoperatively reduces

the postoperative complications to a greater extent. Early intervention in cases of blow out fracture had better outcome post operatively. Transconjunctival incision had lesser incidence of postoperative complications and better cosmetic acceptance. Therefore complications from orbital surgery can be reduced by performing a complete preoperative evaluation with orbital imaging when indicated, choosing the appropriate surgical approach, obtaining adequate exposure, maintaining good hemostasis, and multidisciplinary approach when indicated.

References

1. Hameed- Azzam S, Verity DH, Rose GE. Lateral canthotomy orbitotomy: a rapid approach to the orbit. *Eye (Lond)*. 2017. doi: 10.1038/eye.2017.173.
2. Giraddi GB, Syed MK. Preseptal transconjunctival Vs. subciliary approach in treatment of infra orbital rim and floor fractures. *Ann Maxillofac Surg*. 2012; 2(2) 136-40. doi: 10.4103/2231-0746.101338.
3. Khan AM, Varvares MA. Traditional approaches to the orbit. *Otolaryngol Clin North Am*. 2006; 39:895-909.
4. Lynch RC. The technique of a radical frontal sinus operation which has given me the best results. *Laryngoscope*. 1921; 31:1-5.
5. Humphrey CD, Kriet JD. Sugical approaches to the orbit. *Otolaryngology*. 2008; 19:132-9.
6. Bourquet J. Les hernies graisseuse de l'oribe: Notre traitment chirurgical. *Bull Acad Med (Paris)* 1924; 92:1270.
7. Brett W. Davies, Eric M. Hink, Vikram D. Transconjunctival inferior orbitotomy: indications surgical techniques and complications. *Durairaj Craniomaxillofac Trauma Reconstr*. 2014; 7(3): 169-174. Published online 2014. May 22. doi: 10.1055/s-0034-1374063.
8. D. Udhayakumar, M. Nirmala, Shyamala malla, Saketa.K. Surgical excision of congenital dermoid cysts in the orbit. *IOSR-JDMS*. 2015; 14(2):30-39.
9. Sun F, Song G, Pan Y, Zhao H, Wang D. Surgical treatment of blow out fracture. *Zhonghua Yan Ke Za Zhi*. 2002; 38(11):648-50.
10. Hameed- Azzam S, Verity DH, Rose GE. Lateral canthotomy orbitotomy: a rapid approach to the orbit. *Eye (Lond)*. 2017. doi: 10.1038/eye.2017.173.
11. Lenzi R, Bleier BS, Felisati G, Muscatello L. Purely endoscopic trans-nasal management of orbital intraconal cavernous hemangioma: a systematic review of literature. *Eur Arch Otorhinolaryngol*. 2016; 273(9):2319-22. doi: 10.1007/s00405-015-3733-3. Epub 2015 Jul 26. Review.

Cite This Article as: Malarvizhi R, Vasumathi K, Anuradha A, Sheela A, Abinaya AD. A Clinical Study on Evaluation, Indications, Surgical Techniques and Complications of Various Orbitotomies Done in a Tertiary Care Centre.

Acknowledgments: Nil

Conflict of interest: None declared

Source of Funding: None

Date of Submission: 19 April 2019

Date of Acceptance: 25 October 2019

Address for correspondence

R. Malarizhi DO, MS

Regional Institute of Ophthalmology &
Govt Ophthalmic Institute, Egmore,
Chennai, India

Email id: docmalar@hotmail.com



Quick Response Code