

Assessment of the Factors Reducing Operative and Postoperative Lateral Orbitotomy Complications

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Abstract

Background: Lateral orbitotomy is a well-known approach for lesions of the lateral, superior, and inferior part of the orbit, especially for extraconal lesions. A surgical technique which includes avoiding temporalis muscle aggressive retraction and cutting but meticulous retraction is used instead accompanied with experience of the surgeon about the anatomy of the orbit and avoiding extensive bleeding with the subsequent high infection predisposition; all these factors contribute to the low percentage of complications. **Materials and Methods:** Ten cases were operated upon during the period from 2012 to 2016 in medical city, neurosurgical department. In this regard, contrast-enhanced computed tomography scans gives useful information for operative strategy. All patients were approached using lateral orbitotomy procedure utilizing microsurgical technique taking in consideration meticulous retraction of the temporalis muscle, the site of the lesion, and its relation to the important orbital structure. **Objective:** The objective of this study is to assess of factors that minimize operative and postoperative lateral orbitotomy complications. **Results:** Ten cases operated with consideration to factors reducing complications of those six patients were female, with age range between 35 and 57 (mean 43 years). In four patients, the lesion was cavernous hemangioma, one patient optic nerve glioma, two patients lacrimal gland pleomorphic adenoma, and three patients exophthalmus due to Grave's disease (thyroid eye disease). With meticulous care during muscle retraction without cutting, it had no significant risk of bleeding intra operatively, one patient had early postoperative infection, and another case had unacceptable scar. **Conclusion:** The success of surgery can be improved, operative and postoperative complications can be reduced, and cosmetic problems become acceptable if a meticulous care is taken during temporalis muscle retraction and using microsurgical technique. Operation done by an expert surgeon familiar with the anatomy of the orbit, avoiding extensive bleeding that need drainage system which predispose to high infection rate, will reduce operative and postoperative complications. In addition good operative field matching with the size and the type of the lesion play a role in minimizing the complications.

Keywords: Lateral orbitotomy, microsurgical technique, orbit, temporalis muscle

INTRODUCTION

Lateral orbitotomy is a well-known approach for lesions of the lateral, superior, and inferior part of the orbit mostly extraconal lesions.^[1] Orbital lesions can originate from content itself, from around structures, or can metastasize to the orbit.^[2] Lateral orbitotomy is still appropriate for laterally situated tumors, but with some complications, a surgical technique which includes avoiding temporalis muscle aggressive retraction and cutting but meticulous retraction is used instead accompanied with experience of the surgeon about the anatomy of the orbit, and avoiding extensive bleeding with the subsequent drainage system insertion with resultant high infection predisposition, all these factors contribute to the low

percentage of operative and postoperative complications.^[1,2] Other common complications for such surgery include ocular cranial nerve paresis, infection, ugly scar, hemorrhage mostly muscular, limitation of jaw movement, and pain during eating.^[3]

Aim

The aim of the study was Assessment of factors that minimize operative and postoperative lateral orbitotomy complications.

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MATERIALS AND METHODS

This is a descriptive study of ten cases operated upon during the period from 2012 to 2016 in medical city, neurosurgical department. In this regard, contrast-enhanced computed tomography (CT) scans give useful information for operative strategy although ultrasound and magnetic resonance imaging (MRI) was useful in some. All patients were operated upon with consideration to factors reducing complications (using microsurgical technique, taking in consideration meticulous retraction of the temporalis muscle without cutting it, the site of the lesion, its relation to the important orbital structure such as optic nerve and orbital muscles, consistency, nature of the lesion, and the gender of the patients). Patient followed for minimum 6 months. Patients operated upon by other approaches were excluded in this study. This study was done to show factors which may reduce complications related with this approach regardless of the pathology and its associated complications (for example, in optic nerve glioma (OPN.GLIOMA), the visual acuity already affected due to the lesion itself). All study participants provided informed consent.

Operative technique

Under general anesthesia, S-shaped skin incision was used and curved up to the brow and then posteriorly along the upper margin of the zygomatic arch for approximately 35–40 mm from the lateral canthus to avoid damage the frontal branches of the facial nerve. After skin incision, the fascia of the temporal muscle was incised along the skin incision; the temporal muscle was dissected subperiosteally and retracted posteriorly to expose the lateral orbital bone. Midas Rex pneumatic tool (Midas Rex Inc., Texas, USA) was used to open a bone window. The periorbita was dissected from the inner surface of the lateral wall of the orbit. After the bone removal was completed, an incision was made in the periorbital fascia parallel to the lateral rectus muscle. The orbital self-retaining retractor was used for superior and inferior retraction of the orbital fat. Lateral rectus muscle was dissected from surrounding structures and retracted superiorly or inferiorly with silk sutures. Two main microsurgical routes including above and below the lateral rectus muscle were used to visualize the lesion. The neural and vascular structures in the lateral compartment of the orbit were carefully dissected and preserved. After lesion removal was completed, hemostasis was established and the periorbita was reapproximated. The subcutaneous tissue and skin were closed With Vicryl (Ethicon Ltd., UK).^[2]

RESULTS

Ten cases operated using traditional approach with consideration to the factors reducing complications, of those six patients were female, with the age range between 35 and 57 years (mean 43). In four patients, the lesion was cavernous hemangioma, one patient OPN.GLIOMA, two patient lacrimal gland pleomorphic adenoma [Table 1], and three patients exophthalmus due to Grave's disease (thyroid eye disease). With meticulous care during muscle retraction without cutting,

Table 1: Patients operated with care to factors reducing complications

Case number	Age (years)	Gender	Diagnosis	Complications
1	35	Female	TED	–ve
2	42	Female	TED	–ve
3	38	Female	Pleomorphic adenoma	–ve
4	51	Male	TED	–ve
5	37	Male	Optic nerve glioma	Conjunctival infection
6	45	Female	Cavernous hemangioma	–ve
7	44	Female	Cavernous hemangioma	–ve
8	57	Male	Cavernous hemangioma	–ve
9	38	Male	Cavernous hemangioma	Unacceptable scar
10	45	Female	Pleomorphic adenoma	–ve

TED: Thyroid eye disease

it had no significant risk of bleeding intra operatively, one patient had early postoperative infection, and another case had unacceptable scar although not ugly while no one complaint from pain during mastication.

DISCUSSION

Lateral orbitotomy is one of many approaches to the orbit to deal with orbital lesions depending on the type, size, site, consistency, nature, and vascularity of the lesion. Lateral orbitotomy mostly used for laterally situated orbital lesion in addition to superior and inferior and in some cases of apical lesion of the orbit.^[2,4,5] Utilizing advance diagnostic tools mainly CT scan, ultrasonography, and MRI, the above criteria of the lesion can be assessed.^[2] Furthermore, these investigations modality can be used to diagnose any associated complications and follow-up the patients after operation^[3–5] Transcranial approach which sometimes used as an alternative approaches associated with a lot of complications such as cerebrospinal fluid (CSF) leak, decrease visual acuity, orbital cranial nerve paresis with resultant sequent, paresis of eye gaze, and enophthalmia.^[1,3,6,7] Regardless of the lesion approached through this type of operation (lateral orbitotomy), there may be some complications either due to the surgical lesion itself or surgeon factors.^[7–9] In comparison with the other research used the same approach, we use (Okay *et al.* and Erkan *et al.*) our study that has only one significant complication which is conjunctival infection (chemosis) which respond to medical therapy also one patient complain from unacceptable scar although not ugly, all the rest of the patients have no significant complications, while Okay *et al.* had one patient with CSF leak, other patients transient fourth nerve palsy and one patient complain from chemosis.^[1] On the other hand, Erkan *et al.* have two patients that had temporarily impairment of ocular movement, and one patient have fourth nerve palsy.^[2] In other studies that follow the same principle in the operation, we use (meticulous dissection and retraction of the muscle, familiarity of the expert surgeon about the anatomy of the orbit, and avoiding extensive bleeding

with the subsequent drainage system insertion with resultant high infection predisposition) Arat *et al.*, Cockerham *et al.*, Carta *et al.*, Fisher *et al.*, Hill and Moseley, and Kang *et al.*, they reported low incidence of complications and their result showed no difference from our.^[4-6,8,10,11]

CONCLUSION

To avoid operative and postoperative complications, lateral orbitotomy for laterally situated lesions is preferred over other approaches if done with meticulous and minimal muscle trauma. The success of surgery can be improved, operative and postoperative complication reduced, and cosmetic problems can be minimized if:

- Meticulous care is taken during temporalis muscle retraction
- Using microsurgical technique
- Operation done by expert surgeon familiar with anatomy of the orbit
- Avoiding extensive bleeding with the subsequent drainage system insertion with resultant high infection predisposition
- Have a good exposure according to the size and the type of the lesion with cosmetic care.

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Conflicts of interest

There are no conflicts of interest.

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