Original Article

Aesthetic Outcome of Transconjunctival versus Subciliary Approach for Infra-Orbital Rim and Orbital Floor Fractures

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Abstract

Background: Orbital fractures account for 40% of craniomaxillofacial injuries; of the four walls of the orbit, the floor, which is extremely thin, is the most frequently injured. According to the pertinent literature, such fractures represent 67 to 84% of cases of orbital fractures (Sharma et al. 2012). Injuries in the orbital region have profound functional as well as aesthetic implications. Management of orbital fractures remains one of the most controversial issues in maxillofacial trauma with regard to the classification, diagnosis, surgical approach and treatment.

Objectives

To evaluate and compare the aesthetic outcome of two most commonly applied approaches the transconjunctival with lateral canthotomy and the subciliary approach for the treatment of infraorbital rim and orbital floor fractures.

Method

20 patients with infraorbital rim and orbital floor fractures were treated by transconjunctival and subciliary approaches 10 in each group. 20 patients with a follow-up of 1st, 3rd and 6th post-operative week were included in the study. In post-operative period surgeon evaluated the cosmetic result of the procedure.

Result

On 6th post-operative week 100% patient of subciliary group showed visible scar which is statistically significant. In this group 40% patient showed transient ectropion which is statistically significant. In transconjuctival group no visible scar was seen. Only 30% patient showed transient entropion which is not statistically significant.

Conclusion

The transconjunctival incision produce better aesthetic result than subciliary incision.

Keywords: Orbital fractures, Subciliary incision, Transconjunctival incision

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Introduction

Orbital fractures account for 40% of craniofacial injuries; of the four walls of the orbit, the floor, which is extremely thin, is the most frequently injured. According to the pertinent literature, such fractures represent 67 to 84% of cases of orbital fractures (Sharma et al. 2012).

The zygomatic bone is an essential element of configuration as it constitutes the prominenence of the 'cheek bone'. Beacause of its prominence and exposed location the zygoma is highly susceptible to fractures in facial trauma (Zingg et al.1991). Zygoma forms lateral wall, Infra-orbital rim and floor of the Orbit. Zygomatic complex fractures present challenging diagnostic and reconstructive problems for the surgeon. Anatomic reduction of lateral, inferior orbital rims and orbital floor are necessary to reestablish facial symmetry and position of the globe and restore normal sensation to the structures innervated by the infraorbital nerve (Fonseca, 2000).

The most commonly used approaches to infraorbital rim and orbital floor are subciliary, subtarsal, infraorbital rim and transconjunctival approach .The infraorbital incision can heal well with meticulous wound closure, but the approach is associated with prolonged lower eyelid pretarsal edema (Wesley, 1998). Appling et al. (1993) reported that The subtarsal and inferior orbital rim incisions are relatively easy to perform and in most cases heal well, but these incisions can be conspicuous and associated with eyelid edema due to interruption of lymphatic drainage. The subciliary incision leaves a fairly inconspicuous but still visible scar. Advantages of the preseptal transconjunctival approach are minimal lateral scar, excellent patient acceptance and decreased chances of eyelid retraction or ectropion.

The transconjunctival approach to the orbit was introduced by Dr. Paul Tessier in 1973 for treatment of congenital maxillofacial anomalies and trauma.The primary advantage of the transconjunctival approach to the orbit is its lack of visible scar. Additionally, the transconjunctival incision may decrease the incidence of lower eyelid retraction (sclera show) and ectropion compared with a subciliary approach (Lorenz et al. 1999). The subciliary incision is made 2mm caudal to the cilial line. The subtarsal incision is placed parallel to the ciliary margin just caudal to the tarsus. The infraorbital incision is designed to lie in a skin crease at the level of the bony orbital margin (Crosara et al. 2009).

In the late 1960s "skin only" flap became popular but with incidence of permanent ectropion reported with "skin only" flap.In 1970s"skin muscle "flap was widely used to facial fracture reduction and skin-muscle approach has given more favourable long-term results with good aesthetic outcome, decreased ecchymosis and lower incidence of ectropion, which was usually temporary (Heckler et al.1983). Using transconjuctival incision for infraorbital rim and floor fractures allowed generous exposure of the entire lower orbital rim and zygoma with a lateral canthotomy (Manganello-souza et al.1997). Kushner et al. (2006) reported the lateral canthotomy as an optional extension of the transconjuctival incision, giving the impression that it provides only a modest advantage when exposing the orbital floor.

The aim of this study is to evaluate and compare the aesthetic outcome of transconjunctival and subciliary approach.

Materials and Methods

Study design: Experimental Comparative Study

Place of study: Department of Oral and Maxillofacial Surgery, Dhaka Dental College & Hospital

Period of study: July, 2014 to June, 2015.

Study population: All patients who had been admitted in the Oral & Maxillofacial Surgery Department of Dhaka Dental College & Hospital with infraorbital rim and orbital floor fractures needing surgery.

Sampling method: Convenient sampling.

Sample Size: Total twenty patients who attended the Department of Oral and Maxillofacial Surgery, Dhaka Dental College Hospital, Dhaka with Infra orbital rim/ Orbital floor fractures were selected. In 10 patients Transconjunctival approach were used & in 10 patients Subciliary approach were used.

Study design:

It is a comparative study between Transconjunctival incision and Subciliary incision. Patients with infraorbital rim / orbital floor fractures having surgery during the study period with transconjunctival and subciliary approach were evaluated post-operatively at 1st week, 3rd week and 6th week. Patients were evaluated for visible scar, ectropion and entropion.

Results

Total 20 patients were evaluated post-operatively for aesthetic outcome of two different approaches for the treatment of infraorbital rim and orbital floor fractures. Transconjunctival approach were used in 10 patients and Sub-ciliary approach were used in 10 patients. Male patients were 16 (80%) and only 4 (20%) patients were female. Age ranging from 15 years to 45 years.

Table-1: Age distribution of the patients in both groups (n=20)

Age in years	Trans-conjunctival (n=10) No. (%)	Sub-ciliary (n=10) No. (%)	P value
15-25	1(10.0%)	5(50.0%)	
26-35	5(50.0%)	2(20.0%)	
36-45	4(40.0%)	3(30.0%)	
Total	10(100.0%)	10(100.0%)	
Mean±SD	34.9±9.71	30.6±10.83	0.36

Data were expressed as frequency and percentage and mean±SD Unpaired Student's t-test was performed to compare between groups. p values < 0.05 was accepted as level of significance. n=number of subjects; ns= Not significant; *=significant

Table-1 demonstrating the highest percentage (35%) of total subject from both of the groups is from the age group 26-35 and 36-45 years.

Table-2: Sex distribution of the patients in both groups (n=20)

Sex	Trans-conjunctival (n=10) No. (%)	Sub-ciliary (n=10) No. (%)	P value
Male	6(60.0%)	10(100.0%)	0.025*
Female	4(40.0%)	0(0.0%)	
Total	10(100.0%)	10(100.0%)	

Data were expressed as frequency and percentage and mean±SD Chi-square test was performed to compare between groups. p values < 0.05 was accepted as level of significance.
n=number of subjects; ns= Not significant; *=significant

Table-2 demonstrating sex distribution of the subjects. In this study among 20 patients, male 16 (80%) and female 4 (20%), which is a statistically significant data.

Table-3: Distribution of patients by the complications in 1st postoperative week follow up (n=20)

Complications	Transconjunctival (n=10) No. (%)	Subciliary (n=10) No. (%)	P value
Presence of visible scar			
Present	0(0.0%)	10(100.0%)	< 0.001*
Absent	10(100.0%)	0(0.0%)	
Presence of Ectropion			
Present	0(0.0%)	4(40.0%)	0.025*
Absent	10(100.0%)	6(60.0%)	
Presence of Entropion			
Present	3(30.0%)	0(0.0%)	0.06ns
Absent	7(70.0%)	10(100.0%)	

Data were expressed as frequency and percentage and mean±SD Chi-square test was performed to compare between groups. p values < 0.05 was accepted as level of significance.
n=number of subjects; ns= Not significant; *=significant

Table-3 demonstrating comparative aesthetic outcome of both of the approaches in 7th post-operative day, shows 100% visible scar in subciliary group but no visible scar in transconjunctival group, which is statistically significant. In subciliary group 40% patient shows ectropion but no ectropion in transconjunctival group, which is statistically significant. Whereas transconjunctival group shows 30% entropion but no entropion in subciliary group, which is not statistically significant.

Table-4: Distribution of patients by complications in 3rd postoperative week follow up (n=20)

Complications	Transconjunctival (n=10) No. (%)	Subciliary (n=10) No. (%)	P value
Presence of visible scar			
Present	0(0.0%)	10(100.0%)	< 0.001*
Absent	10(100.0%)	0(0.0%)	
Presence of Ectropion			
Present	0(0.0%)	4(40.0%)	0.025*
Absent	10(100.0%)	6(60.0%)	
Presence of Entropion			
Present	3(30.0%)	0(0.0%)	0.06ns
Absent	7(70.0%)	10(100.0%)	

Data were expressed as frequency and percentage and mean±SD Chi-square test was performed to compare between groups. p values < 0.05 was accepted as level of significance.

n=number of subjects; ns= Not significant; *=significant

Table-4 demonstrating comparative aesthetic outcome of both of the approaches on 3rd post-operative week, shows 100% visible scar in subciliary group but no visible scar in transconjunctival group, which is statistically significant. In subciliary group 40% patient shows ectropion but no ectropion in transconjunctival group, which is statistically significant. Whereas transconjunctival group shows 30% entropion but no entropion in subciliary group, which are not statistically significant.

Table-5: Distribution of the patients by complications in 6th postoperative week follow up (n=20)

Complications	Transconjunctival (n=10) No. (%)	Subciliary (n=10) No. (%)	P value
Presence of visible scar			
Yes/Present	0(0.0%)	10(100.0%)	<0.001*
None/ Absent	10(100.0%)	0(0.0%)	
Presence of Ectropion			
Yes/Present	0(0.0%)	0(0.0%)	-
Non/Absent	10(100.0%)	10(100.0%)	
Presence of Entropion			
Yes/Present	0(0.0%)	0(0.0%)	-
None/Absent	10(100.0%)	10(100.0%)	

Data was expressed as frequency and percentage and mean±SD Chi-square test was performed to compare between groups. p values < 0.05 was accepted as level of the significance.
n=number of subjects; ns= Not significant; *=significant

Table-5 demonstrating comparative aesthetic outcome of both approaches in 6th post-operative week, shows 100% visible scar present in subciliary incision which is statistically significant. None of the group shows ectropion/entropion.

Discussion

Orbital fractures account for 40% of craniofacial injuries; of the four walls of the orbit, the floor, which is extremely thin, is the most frequently injured. According to the pertinent literature, such fractures represent 67 to 84% of cases of orbital fractures (Sharma et al. 2012).

The most commonly used approaches to the infraorbital rim and the orbital floor are subciliary, subtarsal, infraorbital rim and transconjunctival approaches. Appling et al.(1993) reported that The subtarsal and inferior orbital rim incisions are relatively easy to perform and in most cases heal well, but these incisions can be conspicuous and associated with eyelid edema due to interruption of lymphatic drainage. Advantages of the preseptal transconjunctival approach are minimal lateral scar, excellent patient acceptance and decreased chances of eyelid retraction or ectropion.

The study was carried out to evaluate aesthetic outcome of transconjunctival and subciliary incisions. In this experimental study, 20 patients were evaluated in 1st, 3rd & 6th post-operative week to compare visible scar, entropion & ectropion between the two groups. Subciliary approach was used in 10 patients and trans-conjunctival approach was used in 10 patients.

Age ranges of the patients were from 15 years to 45 years and highest percentage (35%) was from age group 26 to 35 and 36 to 45. Female patients were 04 (20%) and male patients were 16 (80%). Among both approach group male patients were higher than female patients.

This study showed 100% visible scar in subciliary incision whereas transconjunctival incision showed no visible scar. Appling et al. (1993) described that the subciliary incision leaves a fairly inconspicuous but still visible scar. Balanand Subramanian et al (2009) reported that transconjunctival approach provides an excellent aesthetic result when done meticulously. Both of the study is consistant with this study.

In the present study 4 (40%) patient of subciliary group showed transient ectropion on 1st & 3rd postoperative week whereas no ectropion was seen in transconjunctival group. In a retrospective study showed 27 subciliary skin--muscle approaches in patients undergoing orbital fracture repair was described by Appling et al. (1993) and found a 12% rate of transient ectropion, this study showed lower rate of transient ectropion which is not consistant with the present study. This discrepancy is may be due to small sample size present study.

In my study transconjunctival approach was used in 10 patients and showed 3 (30%) transient entropion in 1st postoperative week. Giraddi G. B, Sayed M. K (2012) used transconjunctival incision in 10 patients and found 30% transient entropion. So this study reflects same result.

Advantages of the preseptal transconjunctival approach are a minimal lateral scar, excellent patient acceptance, and a decreased chance of eyelid retraction. Using transconjuctival incision for infraorbital rim and floor fractures allowed generous exposure of the entire lower orbital rim and zygoma with a lateral canthotomy (Manganello-souza et al.1997).

While evaluating the results of the study i assessed some parameters. The evaluation of presence of visible scar, entropion and ectropion revealed that transconjunctival approach had better aesthetic result in comparison with subciliary approach.

Limitations of the study

The present study suffered the following limitation and should be kept in mind while deciding on the implications of the findings of the study.

1. This was a single hospital based descriptive study located in the capital city which may not be representative of the whole population.
2. The duration and sample size was small.
3. Patients were not randomized.
4. This was a non-blinding study so there was biasness.
5. In protocol sample size was 30 due to insufficient patient sample size was not completed.

Conclusion

On the basis of result of the present study it may be concluded that for repairing of infraorbital rim and orbital floor fracture transconjunctival approach is better than subciliary approach considering their aesthetic outcome.

However further studies should be conducted with multiple center to evaluate the aesthetic outcome of this two incisions.

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