

A STUDY ON DIFFERENT TYPES OF ECTROPION AND ITS SURGICAL OUTCOME

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ABSTRACT

BACKGROUND

The main aim of this study to evaluate the outcome of surgical treatment of various types of ectropion.

METHODS OF EVALUATION

It was a prospective interventional study conducted among 25 ectropion patients at Orbit and Oculoplasty Department, RIOGOH, Chennai, for a period of 12 months.

RESULTS

Out of 25 patients, 16 (64%) had involitional ectropion, 6 (24%) had cicatricial ectropion and 3 (12%) had paralytic ectropion. Lateral tarsal strip with medial canthoplasty was done in 10 patients (40%), lateral tarsal strip was done in 9 patients (39%), Z plasty was done in 2 patients (8%) with mild cicatricial ectropion scar excision with skin grafting was done in 4 patients (16%) with severe cicatricial ectropion. Except 1 patient (4%), all other 24 patients (96%) had satisfactory surgical outcome.

CONCLUSION

Satisfactory functional and cosmetic correction can be achieved only by individualised surgical approach, which is based on understanding the underlying anatomic factors responsible for the malposition.

KEYWORDS

Ectropion, Watering of Eyes, Inadequate Lid Closure, Canthal Tendon Integrity, Lateral Tarsal Strip Procedure, Z-Plasty, Skin Grafting.

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INTRODUCTION: Ectropion is characterised by eversion of the eyelid margin away from the globe. Ectropion most commonly affects the lower eyelid. Upper eyelid ectropion can also occur following cicatricial changes of the anterior lamella secondary to previous burns or laceration. Following

blepharoplasty or ptosis, repair of iatrogenic upper eyelid ectropion can occur.¹

Pathogenesis of Ectropion: Most Important Pathological Elements are:

1. Horizontal lid laxity.
2. Medial canthal tendon laxity.
3. Facial nerve palsy causing orbicularis palsy.
4. Lower eyelid retractors disinsertion.
5. Vertical tightness of the skin.

One or more factors may co-exist in the same patient. Vigilant examination for proper identification of the underlying anatomic defect is necessary to undertake appropriate surgical correction for better successful outcome.²

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Types of Ectropion:³

- a. Congenital ectropion.
- b. Acquired ectropion.
 1. Involutional ectropion.
 2. Cicatricial ectropion.
 3. Paralytic ectropion.
 4. Mechanical ectropion.

Congenital Ectropion: It is a rare type of ectropion, which occurs secondary to deficiency of eyelid skin leading to vertical shortening. This condition is associated with blepharophimosis syndrome and euryblepharon. In congenital ectropion, lids are opposed at rest, but eversion occurs while attempting to look up or closing the lids. Treatment is horizontal lid shortening with free full thickness grafting.

Involutional Ectropion: Involutional ectropion is the commonest of all ectropion occurring only in the lower eyelid. Involutional ectropion occurs secondary to combination of various factors. These includes canthal tendons laxity, disinsertion of the lid retractors and atrophic or parietic orbicularis oculi due to microinfarcts causing ischaemic changes in the muscle fibres, elastic and collagenous tissue fragmentation within the tarsus leading to thinning and instability. Tearing is the earliest symptom and inferior punctal eversion being the earliest sign.



Fig. 1: Showing Patient with Both Eyes Involutional Ectropion

Clinical Assessment of Lid Laxity: Horizontal Lid Laxity: This is determined by performing pinch test. In this test, lower eyelid needs to be pulled away from the globe. Displacement of lower eyelid if more than 6 mm away from the globe proves the laxity of the eyelid. Snap back test can also be done where lower eyelid is pulled downwards and the speed of returning back to its original position is noted. If the lower eyelid snaps back to normal position within 2 seconds, then integrity of lower eyelid is within normal limits.

Medial Canthal Tendon Laxity: Integrity of medial canthal tendon is tested by distraction test where pulling the lower eyelid laterally and position of the punctum is assessed. If the displacement of punctum is more than 2 mm, it indicates medial canthal tendon laxity. If the lateral excursion of the punctum reaches more than nasal limbus signifies severe laxity.

Lateral Canthal Tendon Laxity: The presence of lateral canthal laxity is grossly identified by the rounded contour of the lateral canthal tendon.

Then, displacement of lateral canthus on medial traction is done if it exceeds more than 2 mm, then laxity of lateral canthus is confirmed. Coexisting narrow horizontal palpebral fissure also suggests canthal tendon laxity.

Lower Eyelid Retractor Weakness or Disinsertion: Clinical Signs Showing Retractor Weakness are:

- Deeper inferior fornix.
- High resting position of the lower eyelid.
- Decreased excursion of the lower eyelid in down gaze.
- A whitish band is seen in the inferior fornix below the tarsal inferior edge.

Cicatricial Ectropion: Cicatricial ectropion occurs as a result of scarring process along with vertical skin shortage or contracture following shortening of the anterior lamella of the lid, which can occur following chemical injuries, thermal injuries certain cicatrizing skin conditions like rosacea, chronic actinic skin damage, eczematoid dermatitis, atopic dermatitis and mechanical trauma.⁴ Method to determine vertical skin shortage is by grasping the lower lid margin and pulling it superiorly and to assess the amount of excursion above the inferior limbus. If it does not reach 2 mm above the inferior limbus, then it proves the presence of vertical deficiency.



Fig. 2: Showing a Patient with Left Eye Cicatricial Ectropion with a Scar below Left Lower Lid

Paralytic Ectropion: Paralytic ectropion occurs secondary to seventh nerve palsy, which occurs following Bell's palsy, cerebrovascular accident, trauma and iatrogenically after resection of peripheral nerve course distal to the foramen lacerum. Inadequate eyelid closure and poor blinking due to atonic orbicularis in this condition can lead to numerous complications like tear film abnormalities, lacrimal pump failure causing watering and poor cosmesis. Most serious and dreadful complication are chronic ocular surface irritation, exposure keratitis and subsequent vision loss. Neurological examination and neuroimaging is mandatory in all case of paralytic ectropion to identify the underlying cause for facial nerve paralysis. Corneal sensation should be checked in all cases to avoid increased risk of corneal decompensation by timely intervention.



Fig. 3: Showing a Patient with Left Eye Paralytic Ectropion

Management: Conservative Management: Lubricating eye drops, gels and ointment should be used generously to improve the symptoms. Taping of the temporal half of the lower eyelid advised during night-time. Moist chambers can be used. Botulinum toxin injection causes levator paralysis there by ptosis, thus protects the cornea.

Surgical Management: In case of permanent paralysis suspension procedures, tarsorrhaphy, medial or lateral canthoplasties can be done.

- Suspension procedure-gold weight implant.
- Silicone/silastic rods.
- Tarsorrhaphy.⁵

Management of Involutional Ectropion: The main ageing changes in ectropion, which requires correction are:

- Lower eyelid retractor weakness.
- Horizontal lid laxity.
- Lamella dissociation where upward movement of posterior lamella against the fixed anterior lamella.

Surgical Approach According to the Pathogenesis of Involutional and Paralytic Ectropion: It may be localised either at the medial canthus or lateral canthus or it can be generalised. Horizontal lid shortening to tighten the eyelid is performed to correct the lid laxity. In case of medial canthal tendon laxity, medial canthal suture is done in mild cases. In case of extensive medial canthal tendon laxity, medial canthal resection can be done. If lateral canthal tendon is the area of maximum laxity, lateral canthal suture is done. In extensive lateral canthal tendon laxity, lateral tarsal strip procedure can be done. If there is generalised laxity - full thickness eyelid resection is done. If generalised laxity is associated with excessive skin - Horizontal shortening along with blepharoplasty known as Kuhnt - Szymanowski procedure is done.⁶

Management of Cicatricial Ectropion:

- Z-plasty.
- Skin replacement procedure:

Aim of the Study: To evaluate the aetiology and outcome of different surgical modalities applicable in the management of various types of ectropion.

Primary Objective: To study the outcome of different surgical modalities applicable in the management of various types of ectropion.

Secondary Objective: To prevent watering and keratinisation of the conjunctiva due to chronic exposure secondary to ectropion.

MATERIALS AND METHODS:

Inclusion Criteria: Patients with following presentations were included in the study.

- Involutional ectropion.
- Cicatricial ectropion.
- Paralytic ectropion.

Exclusion Criteria:

1. Mechanical cause.
2. Ectropion with co-existing eyelid malignancy.

Clinical Evaluation: History and detailed clinical examination was carried out in all cases with ectropion. Snap back test and pinch test were done to detect horizontal lid laxity. Distraction test and examination of contour of the medial and lateral canthal tendon were assessed to detect the canthal tendon laxity. Integrity of retractor assessment was done. Test to detect the vertical deficiency of the skin was carried out. Slit lamp examination for evaluation of anterior segment to rule out exposure keratitis was done. Schirmer's test done to rule out dry eye. Preop systemic investigations like haemoglobin, bleeding time, clotting time and random blood sugar.

Surgical Management: Appropriate surgical management was planned depending upon the type of ectropion and underlying pathogenesis for better surgical outcome.⁷

Involutional ectropion and paralytic ectropion	Lateral tarsal strip with or without medial canthoplasty depending on the integrity of medial canthal tendon
Cicatricial ectropion	Mild ectropion - Z Plasty Severe ectropion - Scar excision with skin grafting.

Surgical Procedures:⁸

Lateral Tarsal Stripping: Horizontal incision is made at lateral canthus and lower limb of lateral canthus is cut. Skin, orbicularis, lashes and conjunctiva are excised from the tarsus to create a new lateral canthus depending upon the laxity. Periosteum is exposed from the lateral orbital rim. The lateral tarsal strip is attached to the periosteum through the double-armed Prolene suture. Orbicularis muscle and skin are closed in layers.

Medial Canthoplasty: Probe is passed into each canalculus. Both lid margin medial to puncta are split and skin is undermined up to 5 mm.

Deep horizontal sutures are placed into orbicularis below inferior and above superior canaliculus. When these sutures are tied, two canaliculi are approximated. Lower lid is elevated and puncta is inverted. Skin is sutured after excising the excess skin.

Z Plasty: The scar tissue is marked with 'Z' shape and skin flaps are cut and deep scar tissue is excised. The Z flaps are transposed and sutured. If scar involving lid margin, a traction suture is placed through the lid margin in the line of original scar and kept for 48 hrs. postoperatively.

Skin Graft: Scar tissue is incised until the ectropion is corrected. Horizontal lid resection is carried out if there is excess lid laxity. Graft is acquired from postauricular area and is sutured in the defect area with absorbable sutures.

Follow up:

- All patients were followed in the immediate postop period, after 1 week, 3 weeks and after three months after surgery.
- During each visit, the following parameters were assessed: Surgical wound site, position of lower eyelid, integrity of lower lid retractor and canthal tendon.

RESULTS:

Age Distribution:

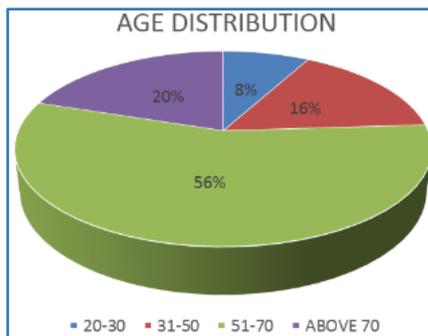


Chart 1: Showing Age Distribution in the Study Group

Sex Distribution: In this study, out of 25 patients, majority of them were males 22 (88%) were males and remaining 3 (12%) were females.



Chart 2: Showing Majority in the Study Group were Males

Types of Ectropion: In this study, among total 25 patients, 16 patients (64%) had involuntional ectropion, 6 patients (24%) presented with cicatricial ectropion and 3 patients (12%) with paralytic ectropion.

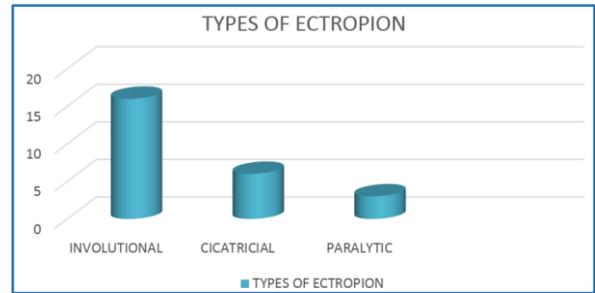


Chart 3: Showing Types of Ectropion in the Study Group

Site of Ectropion: In this study, out of 25 patients, 24 patients (96%) presented with lower eyelid ectropion and 1 patient (4%) alone presented with upper eyelid ectropion.

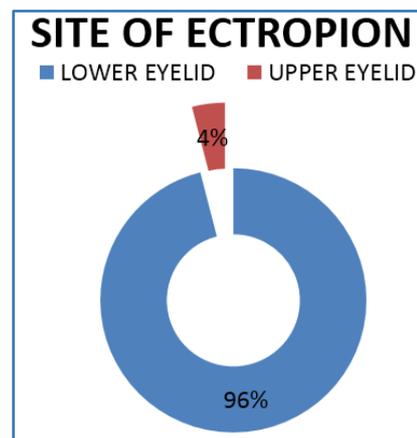


Chart 4: Showing Majority Site of Ectropion as Involving Lower Lid

Integrity of Lateral Canthal Tendon: In the study mentioned above, out of 25 patients with ectropion, 21 patients (84%) presented with laxity of lateral canthus. Remaining 4 (16%) patients had good integrity of lateral canthal tendon. The same is depicted in the chart below.

Aetiology: The most common cause for ectropion in this study is old age with 16 patients (64%) followed by 6 patients (24%) due to traumatic aetiology and 3 patients (12%) due to facial palsy.

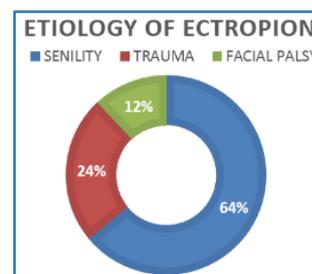


Chart 5a: Showing Aetiology of Ectropion in the Study Group

Presenting Symptoms:

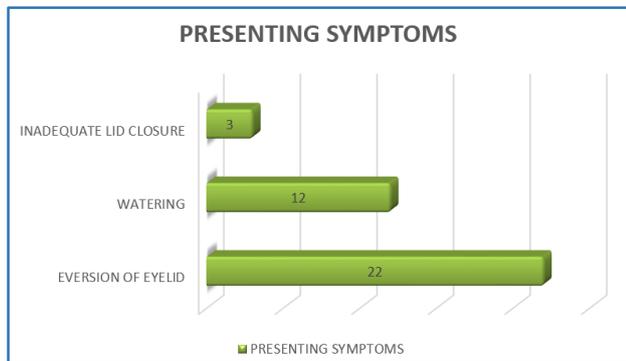


Chart 5b: Showing the Presenting Symptoms of Study Group

Grading of Medial Canthal Laxity:

- Displacement up to the nasal limbus +
- Displacement up to the pupil ++

Here, above 10 patients (40%) had mild medial canthal laxity with displacement of medial canthus up to nasal limbus and 1 patient (4%) had severe medial canthal laxity with displacement up to pupil on distraction test. In the other 14 patients, the integrity of the medial canthus is maintained.

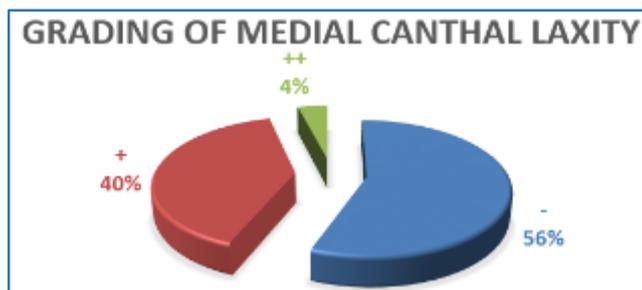


Chart 6: Showing Grading of Medial Canthal Laxity

Position of Punctum:

Punctal Position	Number of Cases	% of Total
Normal	24	96
Everted	1	4

In the study mentioned above, only one patient presented with punctal eversion while all the other 24 patients (96%) the punctal position is maintained.

Corneal Exposure in the Study Patients:

Corneal Exposure	Number of cases	% of Total
Present	1	4
Absent	24	96

In my study mentioned above, exposure keratitis is present in one patient (4%), which was detected by corneal staining and the rest had no exposure keratitis.

Types of Surgical Approach in Various Types of Ectropion:

In the above-mentioned study, the surgical approach was planned according to the underlying pathogenesis and type of ectropion for better surgical outcome. 10 patients (40%) were subjected to lateral tarsal strip with medial canthoplasty, 9 patients (36%) underwent lateral tarsal strip procedure. In 2 patients who presented with mild cicatricial ectropion, Z plasty was done and skin grafting was done in 4 patients with severe cicatricial ectropion. The following pie chart depicts the same.

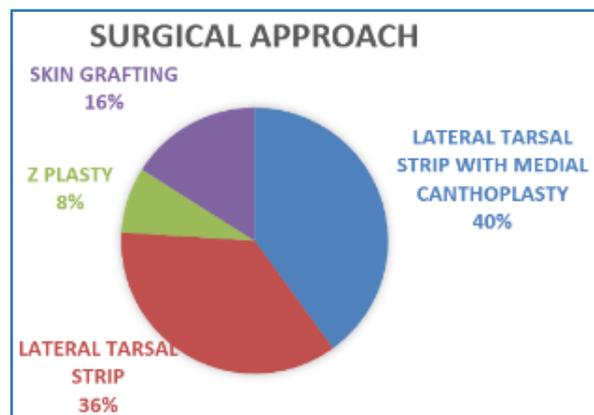


Chart 7: Showing the Types of Surgical Approach in the Study Group

Surgical Modality in Various Types of Ectropion:

Type of Ectropion	Surgical Approach	Number of Cases	% of Total
Involuntal ectropion	Lateral tarsal strip	16	64
Cicatricial ectropion	Mild Z Plasty	2	8
	Severe Skin Grafting	4	16
Paralytic Ectropion	Lateral Tarsal Strip	3	12

In my study, lateral tarsal strip with or without medial canthoplasty was the procedure of choice carried out in 19 patients (76%) who presented with involuntal and paralytic ectropion. In 2 patients (8%) who presented with mild cicatricial ectropion, Z plasty was done and skin grafting was done in 4 patients (16%) with severe cicatricial ectropion.

Outcome of the Surgery in Study Patients:

In this study, out of 25 patients, 24 (96%) patients had a satisfactory surgical outcome in the form of betterment of symptoms, preservation of anatomy (Opposition of eyelid to the globe) and better cosmesis. In one patient (4%) who underwent skin grafting for severe cicatricial ectropion had persistent eversion of the lower eyelid due to insufficient graft uptake.⁹

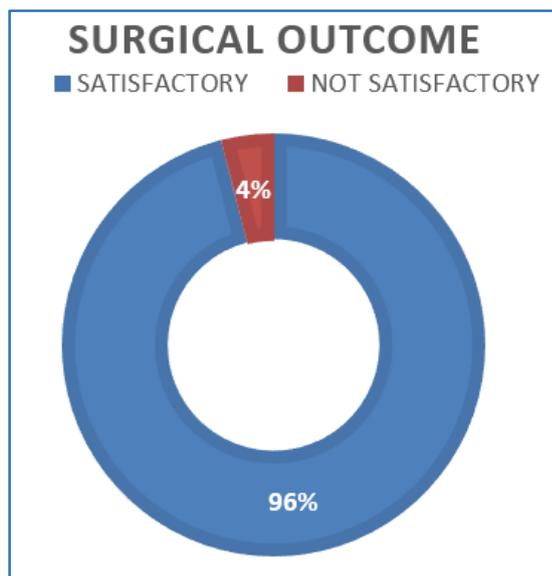


Chart 8: Showing the Surgical Outcome

Evaluation of Parameters Recovery from Symptoms

a) Watering:

Positive - Watering.
 Negative - No watering.

Symptom	Number of Cases	% of Total
Positive	0	0
Negative	25	100

In this study, all 25 patients (100%) had no watering in the postoperative period. The same is shown in the bar chart below.

b) Eyelid Position:

Positive - Opposed to the globe.
 Negative - Everted.

Results	Number of Cases	% of Total
Positive	24	96
Negative	1	4

Here, postoperatively in 24 (96%) out of 25 patients anatomy (Opposition of lower eyelid to the globe) is regained. In one patient (4%) who underwent skin grafting for severe cicatricial ectropion had persistent eversion of the lower eyelid due to insufficient graft uptake postoperatively. The same is depicted in the chart below.

c) Lagophthalmos:

Lagophthalmos	Number of Cases	% of Total
Present	NIL	0
Absent	3	12

In this study, 3 patients (12%) who had inadequate eyelid closure secondary to paralytic ectropion got corrected after surgery (Lateral tarsal stripping with medial canthoplasty). These patients regained better aesthetics postoperatively.

d) Integrity of canthal tendon in the postoperative patients.¹⁰

Distraction Test: Positive (Beyond 2 mm) - Persistent laxity of the canthal tendon. Negative (Less than 2 mm) - Integrity of canthal tendon regained.

Distraction Test	Number of Cases	% of Total
Positive	0	-
Negative	25	100

In this study mentioned above, integrity of medial and lateral canthal tendon is good in the postoperative period in all 25 patients (100%). The same is mentioned in the chart below.

e) Assessment of Horizontal Lid Laxity in Postoperative Patients:

Snap Back Test: Positive (Lid Can Be Pulled Beyond 6 mm) - Persistence of horizontal lid laxity. Negative - Horizontal lid laxity corrected postoperatively.

Snap Back Test	No. of Cases	% of Total
Positive	0	-
Negative	25	100

Here, the integrity of the horizontal lid is good in the postoperative period in all 25 patients (100%) in the study group. The following chart depicts the same.

Assessment of Aesthetics: It is evaluated by means of visual analogue scale. In visual analogue scale, patient is asked to grade the scale from 1 to 10 before and after the surgery.

Score	No. of Cases	% of Cases
≥/ =8	21	84
≥/ =5	3	12
<5	1	4

Persistence of Postoperative Symptoms

Persistent Postop Symptom	No. of Cases	% of total
Persistent Eversion of The Lower Lid	1	4
Watering	NIL	0
Persistent Inadequate Lid Closure	NIL	0

In this study, eversion of the lower eyelid is persistent in one (4%) patient who underwent skin grafting for severe cicatricial ectropion. Remaining 24 patients (96%), eversion of the lower eye lid is regained. No postoperative complications like watering or inadequate lid closure is noted in any of the 25 patients.

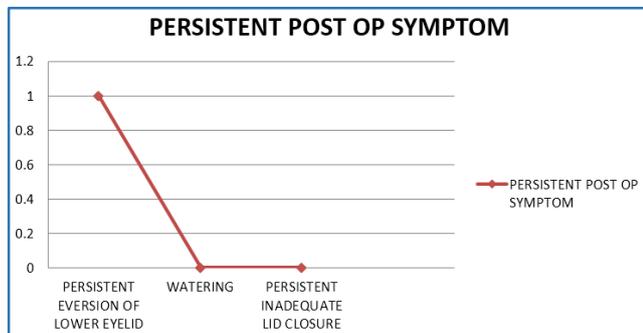


Chart 9: Showing Persistence of Symptoms after Surgery

Outcome Following Different Surgical Modalities of Ectropion:

Surgical Procedure	No. of Cases	Results	
		Number of Cases	
		Satisfactory	Unsatisfactory
Lateral Tarsal Strip	19	19	NIL
Z Plasty	2	2	NIL
Skin Grafting	4	3	1

In this study mentioned above, out of 25 patients, all 19 (76%) patients who underwent lateral tarsal strip with or without medial canthoplasty procedure and 2 patients (8%) who underwent Z Plasty had a satisfactory surgical outcome in the form of betterment of symptoms, preservation of anatomy (Opposition of eyelid to the globe) and better cosmesis. In one patient (4%) among 4 patients (16%) who underwent skin grafting for severe cicatricial ectropion had persistent eversion of the lower eyelid due to insufficient graft uptake. The same is mentioned in the chart below.

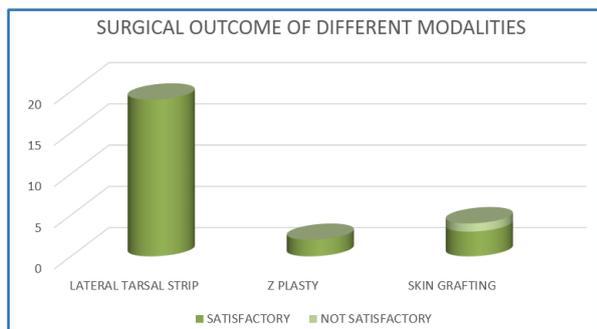


Chart 10: Showing the Surgical Outcome in Different Modalities

DISCUSSION: Lateral tarsal strip procedure and medial canthoplasty procedure gives the successful surgical outcome in the form of alleviation of symptoms like watering, restoration of eyelid anatomy, corneal protection in the lateral aspect of the eye and better cosmesis in the management of involuntal and paralytic ectropion. Both these procedures are simple with a short learning curve. Z plasty and skin grafting is the procedure of choice in the management of cicatricial ectropion with local and generalised defect, respectively.

CONCLUSION: Thus, planning appropriate surgical approach according to the type and pathogenesis of ectropion is the key for successful surgical outcome.

REFERENCES

1. Albert D. Albert Jacobiec’s principle and practice of ophthalmology. Vol 3. 3rd edn. WB Saunders Elsevier 2008.
2. Sihota, Tandon R. Parson’s diseases of the eye. 22nd edn. Elsevier 2015.
3. American academy of ophthalmology. Orbit, eyelids and lacrimal system 2011-2012.
4. Parson’s diseases of the eye. 22nd edn. Elsevier 2015.
5. Levine MR. Manual of oculoplastic surgery. 3rd edn. Philadelphia: Butterworth-Heinemann 2003.
6. Bosniak S. Principles and practices of ophthalmic plastic reconstructive surgery. Vol 1. Philadelphia: WB Saunders 1996.
7. Peyman GA, Sanders DR, Goldberg MF. Basic oculoplastic surgery. In: Principles and practice of ophthalmology. Vol 3. 1st edn. Saunders 1980.
8. Collins JRO. A manual of systemic eyelid surgery. 3rd edn. Edinburgh: Elsevir 2005.
9. Sorsby A. Modern ophthalmology: topical aspects. Vol 4. 2nd edn. JB Lippincott Company 1972.
10. Yanoff M, Duker JS. Ophthalmology. 3rd edn. Mosby Elsevir 2009.