



COMPARATIVE EVALUATION OF MITOMYCIN C AND AMNIOTIC MEMBRANE GRAFT APPLICATION IN EXTERNAL DACRYOCYSTORHINOSTOMY SURGERY

Ophthalmology

Dr Vinay Singh Senior Resident Doctor

Dr Ramyash Singh Yadav Professor And HOD B.R.D. Medical college Gorakhpur.

Dr Jitendra Kumar Senior Resident Doctor

KEYWORDS

INTRODUCTION

Epiphora due to primary nasolacrimal duct obstruction is an often encountered disorder in our community. The gold standard of treatment for Primary Acquired Nasolacrimal Duct Obstruction (PANDO) still remains the external approach of Dacryocystorhinostomy (EXT DCR) technique ever since its evolution in the early 20th century..

But with the advent of better needles, fine suture materials, endoscopes, lasers, powered drills and modern anaesthetic techniques, the attempts were on again in the 1980s to further improve the success rates of DCR. More importantly, better endoscopic techniques has brought to focus the major causes for failure of external surgery, namely scarring within the anastomosis and at the common canaliculus, closure of the ostium by granulation tissue, adhesions to the medial wall of nose, and new bone formation.

Naturally, wound healing modulation with ant fibrotic agents like Mitomycin C and 5 Fluorouracil were the next logical adjuvants to DCR aimed at preventing proliferation of fibroblasts and thereby scar formation which could further potentially refine the success of DCR.

Most of the studies found that intraoperative MMC application seems to be an effective adjuvant that could reduce the closure rate of the osteotomy site after primary EX-DCR, but some patients showed delayed healing of the external skin wound when MMC was used⁽⁷⁾

The use of **amniotic membrane** to promote reepithelialization is well recognized; however, the additional property of suppression of inflammation and inhibition of scarring is also beneficial when dealing with the tissues that may undergo inflammation and scarring⁽⁸⁾, giving results comparable with that of the use of MMC without serious complications⁽¹⁶⁾. This study was conducted to evaluate the use of dried lyophilized amniotic membrane for further improvement in the results of external DCR with respect to the **efficacy and safety**.

AIM AND OBJECTIVES

- Comparative evaluation of mitomycin -c and amniotic membrane graft in external dacryocystorhinostomy (DCR).

OBJECTIVE

- Application of antimitotic drugs at osteotomy site
- Mitomycin -C
- The application of AMG at osteotomy flap site.
- Evaluate the results of the use of dried lyophilized amniotic membrane to increase the survival of external dacryocystorhinostomy with respect to the efficacy and complications

Review Of Literature

Epiphora or overflow of tears is a common complaint that is encountered in our day to day practise. It can be caused by anterior segment causes like a decrease in tear drainage or an increase in lacrimation, lid malpositions, eyelid margin disorders, tear instability or deficiency, trichiasis, superficial foreign bodies and cranial nerve V irritation. All these conditions cause an abnormal increase in tear production. When these conditions are ruled out, tear drainage abnormality is the likely diagnosis.

Primary Acquired Nasolacrimal Duct Obstruction (PANDO)

The 2 categories of Acquired nasolacrimal drainage obstructions are Primary and Secondary. It was Linberg and McCormick introduced the term Primary Acquired Nasolacrimal Duct Obstruction (PANDO) in 1986. They described this entity as nasolacrimal duct obstruction caused by inflammation or fibrosis without any precipitating cause (2). These studies have revealed oedema, vascular congestion, and inflammation of the nasolacrimal duct in the early phases. These changes ultimately resulted in fibrosis with complete occlusion of the nasolacrimal duct's lumen in the late phases. Later, Bartley proposed an etiologic classification system for secondary acquired lacrimal drainage obstruction (SALDO) (3)(4).

Epidemiology

Ancient Egyptians described symptoms attributable to lacrimal outflow obstruction in their papyrus writings according to the famous ophthalmic historian Julius Hirschberg.

Talmud of the Jews mentions lacrimal sac abnormalities. The term '*epiphora*' can be traced back to ancient Greece and is based on the Greek word '*epifora*'. The works of Hippocrates also mentions the relationship between aging and epiphora⁽⁵⁾.

Despite the long historical recognition of the symptoms of lacrimal flow block as described above, there is only very little data available regarding the epidemiology of acquired lacrimal drainage obstruction. Few have reported the incidence of this problem although symptomatic acquired nasolacrimal duct obstruction is so commonly encountered in clinical practice. Dalgleish reported a series of 3487 patients undergoing lacrimal irrigation before all intraocular procedures at one eye hospital in Manchester, Great Britain⁽⁶⁾. He mentions the incidence of lacrimal obstruction to be 11%, increasing with patient age to over 30%.

An incidence of 20.24 per 100,000 has been reported in a study done in Olmsted County, Minnesota, USA⁽⁷⁾.

The incidence of PANDO in the Indian subcontinent has not been quantified yet though it is a fairly common occurrence.

Analysis of Causes of Failure in DCR Factors noted to be the reasons for failure are

- Fibrous tissue growth
- Inappropriate size / location of bony ostium
- Sump syndrome
- Collapse of the bridge between anterior flaps
- Adhesion of the anterior to the posterior flaps
- Obstruction of the bony window with new bone formation
- Untreated common canalicular obstruction
- Intranasal adhesions
- Septate sacs incompletely connected to the nose

New bone formation

As a general principle new bone formation requires the presence of periosteum and, in patients undergoing dacryocystorhinostomy, the periosteum is stripped away, thereby possibly minimising the chances of new bone formation. Primary epithelial closure almost certainly inhibits the new bone formation otherwise likely to occur with secondary intention healing⁽⁴⁰⁾.

Some authors have reported that bone regrowth is occasionally causative for failure of primary surgery⁽⁴¹⁾.

Others maintain that bony regrowth do not occur and that fibrous scar tissue is primarily causative for obstructions at the anastomosis site⁽⁴²⁾.

Role of Scarring

Tissues must be repaired whenever possible by primary rather than secondary intention which is a basic surgical principle. An unopposed mucosal flap can result in secondary haemorrhage, infection and excessive granulation and scarring. This might result in the inadequate passage of tears through a scar rather than through an ideal mucosa lined orifice.

Ever since the first descriptions of DCR operations, authors reporting many large series have brought modifications to the technique and have reviewed the causes of failure in those whom DCR resulted in no relief of epiphora. On revision surgery of these cases, scarring within the anastomosis site was commonly noted in all these series⁽⁴¹⁾⁽⁴³⁾⁽⁴⁴⁾.

Properties of Amniotic membrane

Properties of Amniotic membrane Facilitates migration of epithelial cells Reinforcement of basal cell adhesion Induction of epithelial cell differentiation and promotes goblet cell differentiation Anti-inflammatory action reduces scarring and vascularization bacteriostatic properties Lack of Immunogenicity Cytokines, growth factors and protease inhibitors (IL4,6) EPG, FGF, TGF, HGF and 2-microglobulin. Exclusion of inflammatory cells with anti- protease activities Suppression of TGF- signalling system and myofibroblast differentiation of normal fibroblasts. Prolongation of life span and clonogenicity of epithelial cells. Promotion of non - goblet cells epithelial differentiation. Promotion of goblet cells differentiation when combined with epithelial fibroblast Collection Consenting Sero negative (Hepatitis B and C virus, Syphilis and HIV) maternal donors determined pre surgery elective caesarian section Under sterile conditions .An antibiotic cocktail covering most of Gram -positive and Negative bacteria and fungi in Balanced Salt Solution for 24 hours Second wash of BSS Amnion separated from chorion.

Amniotic Membrane

The structural and regenerative features of AMG have been discussed in detail in the literature.[6] However, the lack of tensile strength and probable transmission of infection can limit its usage.[7]

Anti-inflammatory properties of AMG are due to the secretion of many factors such as: Transforming growth factor-beta (TGF β) Fibroblast growth factor granulocyte colony-stimulating factor (GCSF) Interferon- gamma (IFN γ) Interleukin 1 alpha (IL-1 α) and beta (IL-1 β) Interleukin 4 (IL-4)

- IL-12p40
- IL-12p70
- IL-15
- IL-16
- IL-17[8][9]

Review Of Literature

Page AMG also contains regulators of soft tissue healing (growth factor or GF), including:

Basic fibroblast GF (bFGF)
Beta nerve GF (β -NGF)
Epidermal GF (EGF)
Fibroblast GF 4 (FGF-4)
Hepatocyte GF (HGF)
Growth hormone (GH)
Insulin-like GF 1 (IGF-I)
Insulin-like GF-binding protein 1, 2, 3, 4, and 6 (IGFBP-1,2,3,4,6)
Platelet-derived GF AA (PDGF-AA) and BB (PDGF-BB) Vascular endothelial GF (VEGF)
Transforming GF-alpha (TGF- α) and beta 1 (TGF- β 1)[8][9]

Indications

Use of AMG in Ophthalmology

The uses of AMG in ophthalmology include [3]:

1) Corneal diseases:

Chemical injuries:

Acute chemical injuries with a corneal epithelial defect[10]

As a basement membrane for allo-limbal graft /SLET (simple limbal epithelial transplant) in acute chemical burns[11]. As a basement

membrane for auto-limbal graft /SLET in chronic cases for LSCD (limbal stem cell deficiency) [12]. In the acute stage of Stevens-Johnson syndrome (SJS) [13]. For surface healing/ perforations/ thinning in long-standing SJS Bullous keratopathy

MATERIAL AND METHODS

The present study has been undertaken to review the efficacy of Amniotic Membrane Graft compare to mitomycin- C on success of external DCR surgery. Data for the study will be collected from patients (age Group >16 to 60 year) taken from the outpatient Department clinic of Ophthalmology attached to B. R.D. Medical College, Gorakhpur having chronic dacryocystitis.

Study period: - Nov 2020 to march 2022.

Study Design:- Randomized prospective study

Sample Size - All patients qualifying the study criteria during data collection period will be included in the study. Aving chronic dacryocystitis.

Exclusion Criteria

- obstruction prior to lacrimal sac level
- Acute dacryocystitis 3-Chronic granulomatous condition
- Malignancy of lacrimal sac
- ENT pathology etc. were excluded
- Age <16yr and >65yr

Inclusion Criteria

1- All patients showed an epiphora score of 4 or 5 according to the Munk score 2- Age 16-65 year

All the patients selected were admitted in our indoor wards and were subjected to a battery of examinations and investigations after noting down the particulars about them with brief history of their sufferings. The proforma used for this purpose was as under-

Name Age Sex

Residence Socioeconomic status

Date of admission Date of discharge Chief complaints

History of present illness History of past illness Personal History

Family History

Examination- General Examination

- Detail local examination.
- Detail examination of nasal cavity (ENT checkup)
- Detail examination of lacrimal apparatus.
- Puncta Lacrimale
- Lacrimal sac
- Regurgitation test

SYRINGING:

It consists of anaesthetising the conjunctival sac with local anaesthetic like lignocaine 4% and employing the following procedure. The lid is supported and slightly everted using thumb while patient looks downwards. Then the upper punctum is dilated with a Nettleship's conical dilator. A syringe fitted with a lacrimal nozzle and filled with saline is inserted vertically into the punctum and then directed horizontally with its point pushed well into the commissure. Still supported by the thumb, the plunger is pushed slowly and the results are observed.

- If the passages are freely patent, fluid appears in the nose at once without exerting any extra pressure.
- If considerable pressure is required, a stricture exists.
- If no fluid gets through and an outflow occurs through the lower canaliculus a blockage exists below the common canaliculus and the nature of regurgitated fluid may provide an indication of a purulent infection.
- If no result emerges or any small quantity of fluid which is pushed returns through upper canaliculus, there is block in this structure. In this event, syringing through the lower canaliculus may indicate that the passages are otherwise patent.
- If this doesn't occur the stricture is probably at the junction of the two canaliculi.

Jones Dye Tests:

They are indicated in patients with suspected partial obstruction of the drainage system. In these patients, few or no tears can normally pass

but the lacrimal system can be successfully irrigated. Dye testing is of no value in cases of total obstruction.

1. Jones-I (Primary) Test: Fluorescein drops are instilled into the conjunctival sac. After about 5 minutes, cotton tipped bud moistened in 4% xylocaine is inserted under the inferior turbinate at the nasolacrimal duct opening. The results are interpreted as below.

- Positive- fluorescein recovered from the nose indicates patency of the drainage system. The cause of excessive watering is primary hypersecretion and no further tests are necessary.
- Negative- fluorescein not recovered from the nose indicates partial obstruction (site not known) or failure of lacrimal pump mechanism. Secondary test is required.

2. Jones-II (Secondary) Test: This identifies probable site of obstruction.

Four percent xylocaine is instilled in the conjunctival sac. Residual fluorescein is washed out. Irrigate drainage system using clear saline. Seek for any fluorescein on the cotton tip bud kept at the nasolacrimal duct opening.

- Positive- this indicates partial obstruction of nasolacrimal duct.
- Negative- unstained saline indicates partial obstruction of upper drainage system (puncta, canaliculi and common canaliculus) or a defect in lacrimal pump mechanism.

Dacryocystography:

It is a valuable method of exploration, the results of which are frequently of great value not only in indicating the site of obstruction, diverticula, atonic sac and fistulas but also the state of sac and duct.

In this procedure the conjunctival sac and punctum are anaesthetised by instilling 4% lignocaine. The punctum is dilated and syringing is done to get the sac cleared of its contents. The patient's head is adjusted and adjustment of x-ray tube and plate is also done accordingly. Now 15 to 2 ml dye, which in our cases had been urografin-60%, is pushed through the lacrimal canula with same syringe used for syringing. X-ray in AP and lateral views are taken while pushing the dye down the passage. Now if dye is seen in the nasal cavity on x-ray film, the passage is patent otherwise block is considered. The level of dye in it diagnoses the site of block in the lacrimal passage.

The above mentioned special investigations were used to diagnose the block with its site, and to assess the results in postoperative follow up. These had been investigations of great importance in localising the site of block in failed DCR cases.

Surgical Procedure:

After achieving the proper anaesthesia, the lower punctum on side corresponding to diseased sac or obstruction in lacrimal passage, was dilated and syringing was done with antibiotic solution. By doing this, contents of sac were expelled into the conjunctival sac and doing this eliminated possibility of contamination of operating area during surgery. In few cases at this point methylene blue (1%) was used to irrigate the lacrimal sac.



The head was fixed with face turned slightly away from the side of operation. Incline the patient by tilting the table head up and feet down about 15-20° so as to reduce venous congestion. An operating microscope with coaxial illumination gave an excellent view of the whole surgical area at all stages of the operation. Then the operative field was cleaned, painted with betadine solution and was draped.

Put the antibiotic ointment into the conjunctival sac and close the lid with lid stitch. The curved incision, confirming with the anterior lacrimal crest was given with 15 No. BP blade. The incision was deepened with blunt dissector to expose the medial palpebral ligament and anterior lacrimal crest. The superficial portion of medial palpebral ligament was divided. The lacrimal fascia was incised 1mm lateral to the anterior lacrimal crest. The periosteum was divided from the anterior lacrimal crest to the fundus of the sac and reflected forwards. The sac was reflected laterally from the lacrimal fossa.

The anterior lacrimal crest and the bone from the lacrimal fossa was removed and an osteotomy 5mm in diameter was created by bone punch or trephine. Probe was introduced into the lacrimal sac through the lower canaliculus and sac was incised vertically to create two flaps. A vertical incision was made in nasal mucosa to create anterior and posterior flaps.

In selected patients of group I, 0.2 mg/ml of Mitomycin-C soaked sponge was placed at osteotomy site for 5 minutes, so that it touched both nasal and lacrimal mucosa. Sponge was removed. Osteotomy site was cleaned and washed with plenty of normal saline.

And selected patients of group II arterially prepared amniotic membrane graft (AMG) was placed at osteotomy site, so that it touched both nasal and lacrimal mucosa and it sutured with flap.

The respective flaps were sutured with 6-0 chromic catgut. The two heads of orbicularis muscle were reapposed and sutured with 6-0 chromic catgut. Skin was closed with interrupted or subcuticular 6-0 silk suture. Eye was pad and bandaged with antibiotic ointment.



Follow Up:

Was maintained for 12 months for the evaluation of abnormal overflow of tears and the patency of the LDS by syringing were scheduled on first and 10th postoperative day and after 1,3,6, and 12 months from the date of surgery

- During post-operative follow up, check-up was done to look for
- Any complaints (epiphora, pain).
- Examination of wound.
- Examination of lacrimal apparatus.
- Syringing
- Jones I and II tests
- Probing (as and when required)
- Dacryocystography (as and when required)
- Examination of eye proper.

- Any complication of surgery (bleeding, failure etc.)

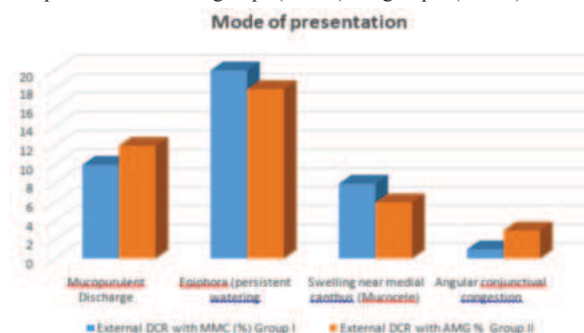
OBSERVATION

- With the study done we got the following results:
- A Total of 78 patients underwent DCR procedure out of which 39 patients opted for external DCR surgery with Mitomycin-c Group I
- And 39 patients underwent external DCR Surgery with amniotic membrane graft Group II following observations were made:

Table 1 : Mode of presentation

Mode of presentation	External DCR with MMC (%) Group I	External DCR with AMG % Group II	Total
Mucopurulent Discharge	10 (25.64)	12 (30.76)	22(28.20)
Epiphora (persistent watering)	20 (51.28)	18 (46.15)	38(48.71%)
Swelling near medial canthus (Mucocoele)	8 (20.51)	6 (15.38)	14 (17.94%)
Angular conjunctival congestion	1 (2.56)	3 (7.69)	4 (5.12)
Total	39	39	78

- In our study of 78 cases, 38 cases (48.71%) were having persistent watering of the eye (epiphora), followed by 22 cases (28.20%) that had associated mucopurulent discharge with watering. 14 cases (17.94%) presented with swelling near medial canthus (mucocoele) while 4 cases (5.12%) had angular conjunctivitis.
- Persistent watering (Epiphora) was the leading mode of presentation in both group I 20 cases (51.28%) and group II 18 cases (46.15%), followed by mucopurulent discharge, 10 cases (25.64%) in group I, and 12 (30.76%) in group II.
- Angular conjunctival congestion was the least among the mode of presentation in both group I (2.56%) and group II (7.69%)



Success rate in both Group at 6 months and 12 months Table II Summary of surgical success.

Months	External DCR with MMC (%) Group I	External DCR with AMG % Group II	P = Value
6th months	35 (90.90%)	36 (92.30)	P=0.48 non Significant
12th months	30(76.36)	37 (94.54)	P=0.03 Statistically Significant

REHABILITATION

After surgical intervention is studied and evaluated under following criteria's:

- Pain:** After 12 hours of surgery for which oral/ iv medication is taken
- Periorbital/nasal swelling:** Persisting even after 12 hours of surgery.
- Wound gapping/ abscess:** Seen in and around wound after 1 day of surgery.
- Nasal bleeding:** For which active intervention in terms of operative/ medical management is taken after 12 hours of surgery. If in a patient

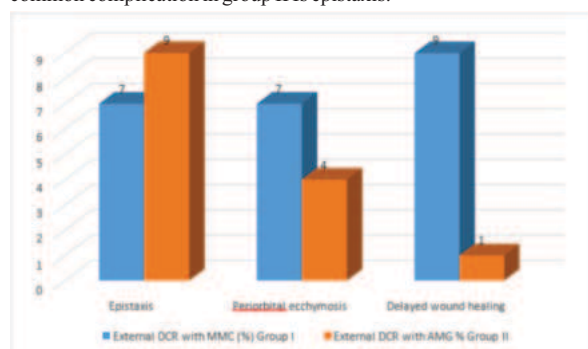
3/>3 criteria are present - Slow Rehabilitation.

2/<2 criteria are present - Fast Rehabilitation.

Table 11 Postoperative Complications Encounterd in Both Group 1st and 10th Postoperative Days

Post op complication	External DCR with MMC (%) Group I	External DCR with AMG % Group II
Epistaxis	07 (18%)	09 (22%)
Periorbital ecchymosis	07(18%)	04 (10%)
Delayed wound healing	9 (23.07 %)	01 (1.81%)

Delayed wound healing and periorbital ecchymosis more incidence in Group I compare to group II where used amniotic membrane graft due to its anti inflammatory property and secretion of growth factor most common complication in group II Is epistaxis.



Postoperative Complications Encounterd in Both Group 1st and 10th Postoperative Days

DISCUSSION

Dacryocystorhinostomy is a surgical procedure to short circuit the lacrimal passage from lacrimal sac to nasal cavity bypassing the nasolacrimal duct in cases having occlusion of nasolacrimal duct and dacryocystitis. Various strides have been made in direction of treating dacryocystitis and of these DCR surgery had been an important one. In external DCR, several modifications have been introduced to decrease the failure rate. One of these is application of mitomycin-C at the osteotomy site. The present study is an attempt intended to work out any fact to the end that how far use of mitomycin-C will have any bearing on overall and long term results of DCR surgery.

The present study entitled Comparative Evaluation of Mitomycin –C and Amniotic Membrane Graft Application in External Dacryocystorhinostomy (DCR) on success of external DCR surgery" had been conducted in department of Ophthalmology B.R.D. Medical College, Gorakhpur. It was done during the period of November 2020 to March 2022, a period of 17 months. The cases had been selected from OPD of our department.

Of the 120 patients of chronic dacryocystitis visiting our OPD, 78, consented for surgery. The cases were subjected to various general and local examinations and some investigations to judge their fitness for surgery. Syringing and dacryocystography were among the important investigations used to diagnose the case and to find the site of obstruction in lacrimal passage preoperatively and to assess the results in postoperative follow up period.

The most common reasons for recurrence, as shown by endoscopic endonasal examination, included a closure of the bone window by the hypertrophic nasal mucosa and granulation tissue and fibrous tissue formation at the osteotomy site. To increase the success rate in cases of DCR, combined MMC and intubation by silicone tubing may be performed. This study aimed to study the novel use of amniotic membrane as an adjuvant to EX-DCR with respect to the efficacy and safety. The results revealed that, of the 78 eyes of 78 patients included in the study, 51 were female patients (65%) and seven (35%) were male patients, with mean age of 47.6 ± 6.5 and 50.2 ± 7.1 for groups I and II, respectively. All demographic characteristics showed insignificant difference between both groups with respect to the success rate; all patients showed 100% subjective (symptomatic relief) and objective success rates (on examination) in both groups at 3-month follow but at the end of follow-up (12m) the success rate decreased to 76.36% in the first group and 94.54% in the second group. This difference was

statistically significant ($P=0.0288$).

The treatment failed in 11 patients (9 in group I and 2 in group II); all of them showed fibrous tissue occlusion at the site of the ostium as seen by endonasal endoscopy during ENT examination. Hence, they underwent surgical revision of the ostium.

No recurrence occurred in these patients. The most common complication encountered in Group II was epistaxis, which occurred in 9 patients (22%) in group II and in 7 patients (18%) in group I; all complications occurred within the first 3 postoperative days, most of them ceased spontaneously and only two patients required nasal pack. Other complication was periorbital ecchymosis (7 patients); in group I and 4 patients in group II, it was resolved with the use of hot fomentation for 3–5 days. In one patient in group I, the lower punctum was slit opened (cheese wiring) using a silicon tube. The complication rate was statistically insignificant between the two groups ($P=0.897$; Table 11). Discussion NLDO is the most frequent form of lacrimal obstruction. Its prevalence gradually increases at the age of 40. With respect to etiology, the most frequent cause of NLDO is an evolutionary stenosis in the elderly and an idiopathic stenosis in young people and adults. The usual treatment is DCR with various approaches, external DCR being utilized typically with successful results in ~90–95% of patients. Other approaches such as endonasal endoscopic DCR or laser endocanalicular DCR are alternatives to external approaches.

Demographic and characteristics of patient included in the study Item Group I ($n=39$) Group II ($n=39$) P value Age (mean $\pm$ SD) 50.8 ± 6.5 48.2 ± 7.1 0.481 Sex Male 27 0.513 Female 51— Diabetes mellitus 8.062 Previous ocular surgery 2 cataract 3 cataract 1 pterygium 0.083 Previous acute dacryocystitis 2.592 Nasal pathology as polyp or hypertrophied turbinate 0 polyp 0 hypertrophied turbinate Success rate in both groups ($N=39$ patients in each group) Patient groups 6th postoperative month [N (%)] 12th postoperative month [N (%)] Group I Success 35 (90.90%) 30 (76.36%) Failure 5 (12.82%) Group II Success 36 (92.30%) 37 (94.54%) Failure 2 (5.40%) P value 0.0288 (significant) The incidence of success rate in group I and group II during the end of follow-up period was statistically significant ($P<0.05$). Table 11 Postoperative complications encountered in both groups Complications Group I ($n=39$ eyes) [N (%)] Group II ($n=39$ eyes) [N (%)] P value Epistaxis 7 (18%) 9 (22%) 0.512 Periorbital ecchymosis 7 (18%) 4 (10%) Delayed wound healing 9 (23.01%) 1 (18.11%) 0.521 was statistically significant ($P=0.0288$) and reflected the value of the use of amniotic membrane as an adjuvant to EX-DCR because of its properties of reconstruction of the ostium, promoting its epithelialization with inhibition and prevention of fibrosis and granulation tissue formation. The most common complication encountered in this study was epistaxis, which occurred in 7 patients (18%) in group I and in 9 patients (22%) in group II. Other complication was periorbital ecchymosis, which was found in 7 patients in group I and 4 patients in group II.

SUMMARY AND CONCLUSION

- Dacryocystorhinostomy is the treatment of choice for chronic Dacryocystitis
- The use of amniotic membrane graft (AMG) in external DCR surgery was effective in improving the result and increasing the survival of Osteum between the sac and nasal cavity with less complication.
- with respect to success rate all patients showed 100% symptomatic relief in group 1 and 2 and no Epiphora / regulation of fluid at end of 3 month
- but after long term follow up the success rate decreases maximum in group 1 compared to group 2
- the success rate was greater in AMG Group after long fallow up than MMC Group, we did not found any local or systemic side effect of AMG and no other complication other than non-patency in above mentioned group
- before establishment of this statement strategy larger multicenter study with longer follow up are needed
- the choice in regards to surgical technique should depends upon patient preference, availability of resources and surgical expertise.
- explain the patients, well about the advantages and disadvantages of each technique.

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