

STUDY ON MANAGEMENT OF EPIPHORA IN PATIENTS WITH OBSTRUCTION AT VARIOUS LEVELS OF NASOLACRIMAL APPARATUSS. Shivranjani¹, Jaishree Dwivedi², Neha Mithal³, Sandeep Mithal⁴**HOW TO CITE THIS ARTICLE:**

S. Shivranjani, Jaishree Dwivedi, Neha Mithal, Sandeep Mithal. "Study on Management of Epiphora in Patients with Obstruction at Various Levels of Nasolacrimal Apparatus". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 80, October 05; Page: 14022-14033, DOI: 10.14260/jemds/2015/1995

ABSTRACT: This Population based Prospective interventional study was carried out in 120 eyes of 120 patients of outpatient department Detailed history was taken regarding onset, duration, preceding symptoms, ocular morbidity, data related to risk factors, past illness, systemic illness if any recorded and through clinical examination along regurgitation test, fluorescent dye disappearance test, jones dye test, probing, syringing. Epiphora is most common in the age group of 40-50 years (66 patients). Prevalence of epiphora is more in common in females (70%) than males (30%). The mean period of epiphora in our study was 1.5 years ranged from 0.5 years to 3.5 years. Syringing and probing are the main tests for the investigation of epiphora and level of block in Nasolacrimal system. Our study suggests that canalicular trephination and silicone stem intubation should be considered as an alternative treatment for distal canalicular obstructions. Highest success rates were seen in distal lower canalicular obstructions followed by distal bicanalicular obstructions and common canalicular obstructions. Complication rates are low, particularly when compared with the DCR with Jones tube placement. No correlation was found between infectious and idiopathic causes of epiphora to the surgical outcome. Eye with proximal canalicular obstruction may have increased risk of recurrence. Factors significantly associated with recurrence of epiphora during follow up of patients after surgery included proximity of block and chronicity of disease. This study identifies punctoplasty is the surgery of choice for punctal occlusion. In unicanalicular obstruction trephination with mini monaka stent has better surgical outcome. In patients with distal common canalicular obstruction bicanalicular silicone tube intubation with external dacryocystorhinostomy is the procedure of choice. In patients with nasolacrimal duct obstruction external dacryocystorhinostomy has a good surgical outcome. Distal monocanalicular obstructions have the highest degree of symptomatic epiphora relief, followed by distal bicanalicular, common and proximal obstructions.

KEYWORDS: Nasolacrimal apparatus, Dacryocystitis, Dacryocystorhinostomy, Mucocele of lacrimal sac.

INTRODUCTION: Epiphora is the term reserved for an overflow of tears from the eye because of an obstruction, stenosis, punctal malposition or functional disorder of the lacrimal passage.

The first step is to determine whether the epiphora is caused by an increase in lacrimation or a decrease in tear drainage. Trichiasis, superficial foreign bodies, eyelid malposition, diseases of the eyelid margins, tear deficiency or instability, and cranial nerve V irritation may cause an abnormal increase in tear production.

Abnormalities of tear drainage may be subdivided further into functional and anatomical. Functional failure is related to poor lacrimal pump function, which may be due to a displaced punctum, eyelid laxity, weak orbicularis, or cranial nerve VII palsy. Anatomical obstruction may occur at any point along the lacrimal drainage pathway and may be congenital or acquired. Congenital obstructions tend to produce symptoms during the neonatal period.

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The two types of acquired nasolacrimal drainage obstructions (NLDO) are:

- a) Primary (PANDO).
- b) Secondary (SALDO).

In 1986, Linberg and McCormick coined the term primary acquired nasolacrimal duct obstruction (PANDO) to describe an entity of nasolacrimal duct obstruction caused by inflammation or fibrosis without any precipitating cause.¹

According to the site and level of obstruction, NLDO can be further classified into.^{2,3,4}
Proximal NLDO.
Distal NLDO.

Functional Causes: Proximal obstruction are those within 4mm of punctum, distal obstruction are those 5mm to 9mm of punctum, common canalicular obstruction are those 10mm or greater from the punctum (Philpott et al., 2009).

Proximal obstruction can be defined as punctal stenosis or absence and single canalicular or common canalicular (lateral or medial); common medial canalicular blockage may be regarded as a distal blockage as it is usually caused by a membrane within the lacrimal sac closing off the internal opening of the common canaliculus. Distal obstruction can be divided into sac and duct; the third category is functional obstruction.

Pathophysiology: PANDO is more common in middle-aged and elderly females. Women have significantly smaller dimensions in the lower nasolacrimal fossa and middle nasolacrimal duct.⁵

The general categories of causes of SALDO include infectious, inflammatory, neoplastic, traumatic, and mechanical. Bacteria, viruses, fungi, and parasites have been implicated as causes of infectious lacrimal drainage obstruction. Inflammation may be endogenous or exogenous in origin. Wegener granulomatosis and sarcoidosis are 2 examples of endogenous origins.

Exogenous causes of cicatricial lacrimal drainage obstruction are eye drops, radiation, systemic chemotherapy, Neoplasms may cause lacrimal obstruction by primary growth, secondary spread, or metastatic spread. Primary neoplasms may arise in the puncta, canaliculi, lacrimal sac, or nasolacrimal duct.

Trauma may be iatrogenic in the case of scarring of the lacrimal passage after overly aggressive lacrimal probing. Iatrogenic causes of NLDO also may follow orbital decompression surgery, paranasal, nasal, and craniofacial procedures.

Mechanical lacrimal drainage obstructions may be due to intraluminal foreign bodies, such as dacryoliths or casts.

Present study will try to evaluate the patients with acquired causes of epiphora clinically as well as surgical management relevant to the level of blockage of nasolacrimal apparatus.

AIMS & OBJECTIVES:

- Clinical evaluation of the patients with epiphora.
- To assess the level of blockage of lacrimal apparatus.
- Appropriate surgical management according to level of block.
- To assess the post-operative anatomical and functional successful outcome.

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MATERIAL AND METHODS:

Study Design: A Population based Prospective interventional study was done on patients selected from OPD and camps during 2012-2013.

Inclusion Criteria:

Age 10-60 years.

Patient who gives written informed consent.

Mentally and physically fit up to a minimum level required to participate in study.

Exclusion Criteria:

Not interested/unable to provide informed consent.

Detailed history specially seeking symptoms of disease itself & its complications such as.

- Watering.
- Discharge.
- Decrease in vision.
- Topical drugs.
- Photophobia.
- Irritation.
- Ocular, nasal, facial, surgery.
- Trauma.
- Recurrent Infection.
- Recurrent cold, sinusitis, epistaxis.

Parameters studied are age, sex, chief complaints, past ocular history, past medical history. The investigations planned to be taken are Haemogram, Blood Sugar (FBS and PPBS), BT & CT, Blood Urea Serum Creatinine and Platelet count.

WORK UP: Our aim was to confirm information obtained in the history. It also helps in evaluating which segment of the lacrimal drainage apparatus is obstructed.

The Examination Includes: Inspection of the eyelid position, contour and function in relation to the operation of the lacrimal pump. Malpositions of eyelid such as ectropion, where in the punctum is not opposed to the globe will always be associated with epiphora.

Facial nerve palsy may lead to paralytic ectropion/weakness of orbicularis muscle.

We carefully looked for Punctal abnormalities Punctal ectropion may be associated with epiphora. Each punctum should be assessed for patency.

Congenital/acquired stenosis of the punctum may interfere with tear drainage mechanism. Swelling/erythema around the punctum may signify canaliculitis.

The canalicular area was palpated carefully in order to seek evidence of calculi.

Palpation over the medial canthal area was done to reveal a mass in the area of lacrimal sac, lower lacrimal drainage channel obstruction, palpation over lacrimal sac area will cause pain with reflux of tears/secretions/pus.

All suspected patients have undergone diagnostic nasal endoscopic examination to rule out sino nasal causes of lacrimal outflow obstruction.

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Slitlamp examination was done to reveal elevation of pre corneal tear film. Systemic Examination include BP, Pulse rate to rule out any systemic risk factors for bleeding

Ocular Examination include Vision, pupillary reaction, intra ocular pressure was done.

Test for epiphora include Regurgitation test in which When pressure is applied over the lacrimal sac there is a reflux of mucoïd or mucopurulent material from the punctum.

Fluorescein dye disappearance test is helpful in confirming the diagnosis of nasolacrimal duct obstruction.

With Jones dye tests we distinguished between functional and anatomic outflow problems.

Recovery of fluorescein dye in the nose indicates a functionally and anatomically patent system. Non-recovery of the dye (Negative result) suggests a functional or anatomic blockage.

In the event of negative dye test, secondary dye test was performed.

If fluorescein dye is present in the irrigant (Positive result) then it is assumed that the upper lacrimal system is functional while the lower system is partially open and is not functional. Recovery of a clear irrigant (Negative result) indicates a functional problem with the upper system.

Probing was done to identify the level of block in nasolacrimal system.

Syringing To perform irrigation of the lacrimal drainage system, A patient with a normally functioning lacrimal drainage system will feel and taste the fluid passing into the nasopharynx as it is injected. If the cannula cannot be advanced, if the irrigation fluid cannot be injected, or if the fluid refluxes back through the punctum around the cannula, total canalicular obstruction is likely to be present. If the saline can be injected but refluxes through the opposite canalicular system, blockage of the common canaliculus or nasolacrimal duct obstruction is likely to be present.

In patients with punctal occlusion punctoplasty was done. In patients with unicanalicular obstruction mini monaka stent or canalicular trephination was done. In patients with distal common canalicular obstruction with soft stop bicanalicular silicon tube intubation with external dacryocystorhinostomy was done. In patients with hard stop and obstruction beyond lacrimal sac external dacryocystorhinostomy was done.

After surgical procedure patients were followed on post-operative day 1, after 1 week, after 2 weeks, after 1 month, after 3 months, after 1 year.

At every visit syringing by saline mixed with antibiotic solution was done.

- Main outcome measures were:
- Patency of nasolacrimal system after surgery.
- Post-operative complications.
- Recurrence of epiphora.

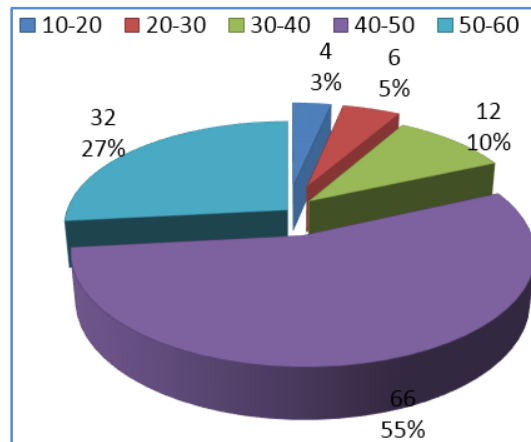
For the control group external dacryocystorhinostomy was done. For patients with punctal occlusion punctoplasty was done. For patients with unicanalicular obstruction trephination with mini monaka stent with dacryocystorhinostomy was done. For patients with common canalicular obstruction, bi canalicular silicone tube intubation with external dacryocystorhinostomy was done. For patients with nasolacrimal duct obstruction external dacryocystorhinostomy was done.

OBSERVATION AND RESULTS: We investigated demographic findings such as age, sex, time of first diagnosis of epiphora with nasolacrimal system obstruction and patency of nasolacrimal system post-surgical through the period of this study.

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AGE GROUP (YEARS)	NUMBER OF PATIENTS
10-20	4
20-30	6
30-40	12
40-50	66
50-60	32
TOTAL	120

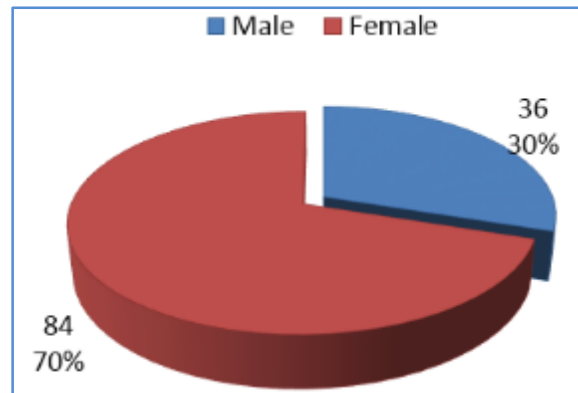
Table 1: Age Distribution in study group



Sex	Number of patients	Percentage
Male	36	30
Female	84	70

Table 2: Sex Distribution

Out of the 120 patients include in the study, 36 patients were male and 84 patients were female with a sex ratio of 2:1



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Table 3: Risk Factors: The mean period of presentation of epiphora history was 2 years (range from 6 month to 4 years). Twenty four patients had a history of recurrent dacryocystitis. Nine patients had history of previous endonasal dacryocystorhinostomy. Thirty two patients had recurrent conjunctivitis, ocular infections.

Risk factors	Recurrent dacryocystitis	Endonasal dacryocystorhinostomy	Recurrent conjunctivitis	Idiopathic
No. of patients (120)	24	9	32	55
Percentage (100)	20	7	27	46

Table 3: Risk Factors

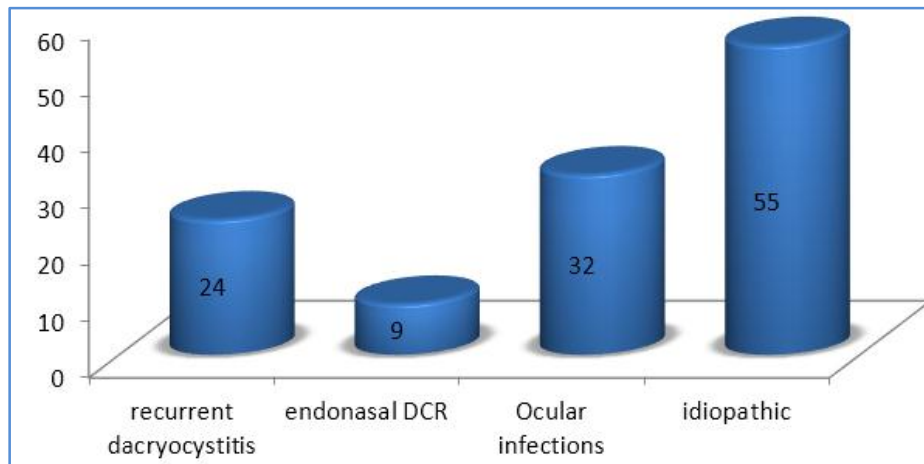


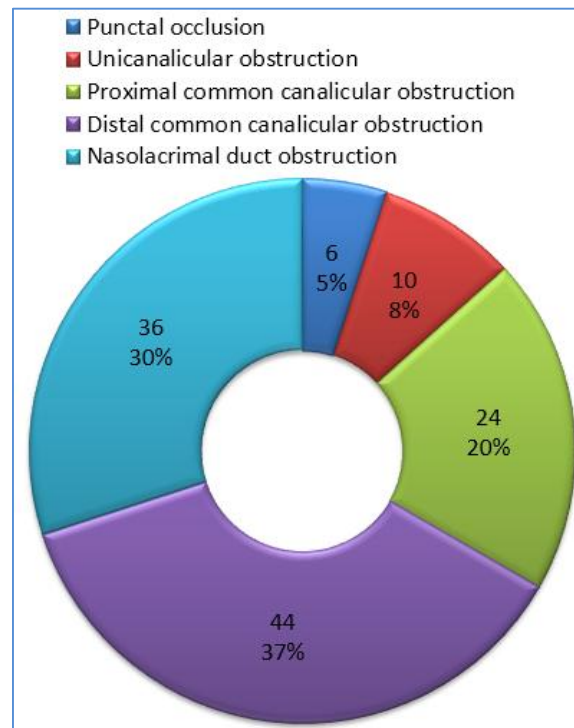
Table IV: SYRINGING AND PROBING

The patients were divided into five groups based on syringing and probing and were followed up at 1 post-operative day 1, 1 week, 1 month, 3 months, 6 months, 1 year.

Level of obstruction	Punctal occlusion	Unicanalicular obstruction	Proximal common canalicular obstruction	Distal common canalicular obstruction	Nasolacrimal duct obstruction
Number of patients	6	10	24	44	36
Percentage	5	8.3	20	36.6	30

Table 4: Syringing and Probing

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120 eyes of 120 patients were identified. The mean age at surgery was 35 (range 10 to 60 years). The silicone stents were placed for a minimum of 1 month (mean. 1.5 months; ranges, 1- to 3 months), excluding 3 patients with unplanned self-performed premature removal. Follow-up was for a minimum of 3 months after stent removal (mean, 6 months; range, 3 to 12 months).

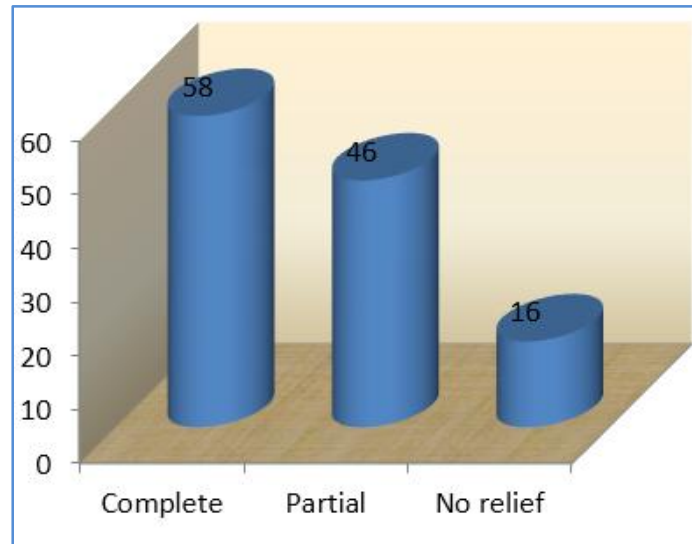
Common canalicular obstruction was most common (68 eyes), followed by nasolacrimal duct obstruction (36 eyes), unicanalicular obstruction (10 eyes), and punctal obstruction (6 eyes), the site of obstruction was not recorded in one patients, and surgical outcome of this patient was included in our data on overall epiphora relief only.

For all levels of obstruction combined that underwent successful trephination and stenting, complete epiphora relief was achieved in 58 of 120 eyes (49%) partial relief in 46 of 120 eyes (39%) and no improvement in 16 of 120 eyes (13%) Categorized by the level of obstruction, distal canalicular obstruction was treated most successfully (80% complete and 20% partial relief of epiphora), and common canalicular obstruction (59% complete, 29% partial, and 12% no relief) (Fig. 3). Proximal bicanalicular obstruction was treated least successfully, with no eyes having complete relief of epiphora. 55% having partial relief, and 45% having no relief. The cause of canalicular obstructing was.

Relief of epiphora	Complete	Partial	No relief
Number of Patients	58	46	16
Percentage	49	38	13

Table 5: Relief of Epiphora

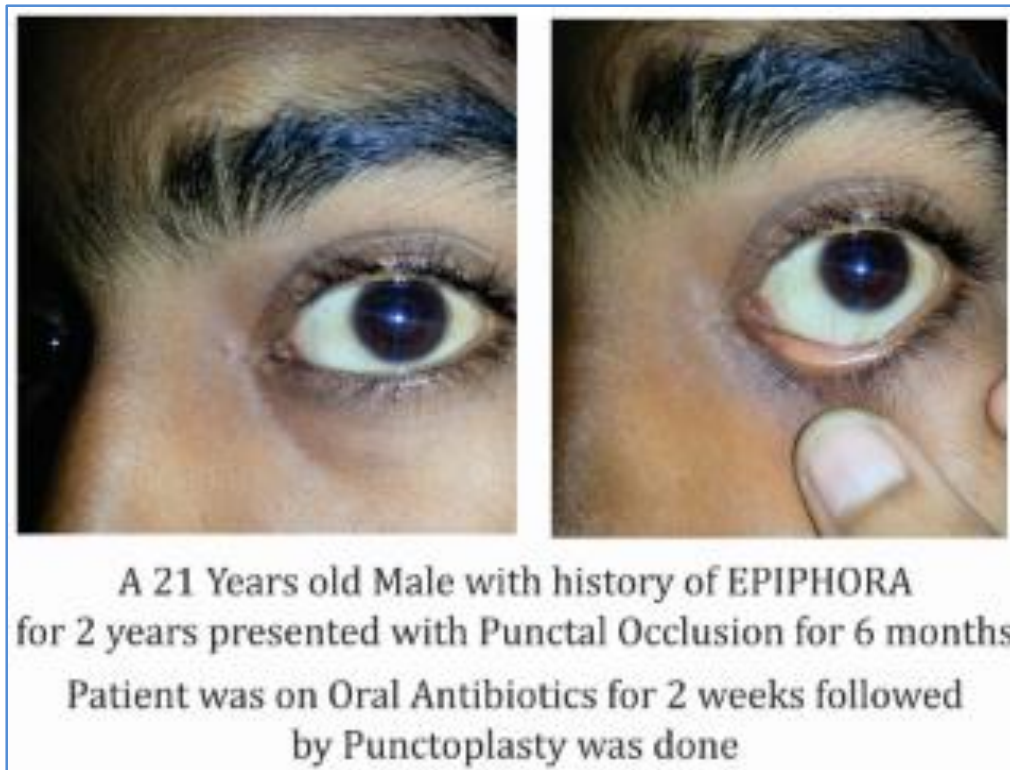
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Evident in 58-120 cases (49%). When the origin of obstruction was evident in was known. Infection was the most common cause (49%) followed by idiopathic (51%).

Seventy-five percent of patients with infectious caused had complete epiphora relief and 25% had partial relief. Sixty percent of patients with idiopathic caused had complete relief, 25% had partial relief, and 15% had no improvement.

Complications included three cases of inadvertent premature stent removal.



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A 50 Years old female with history of EPIPHORA for 2 years presented with mucocele for 6 months Patient was on Oral Antibiotics for 3 weeks followed by Bicanalicular silicon tube intubation with external dacryocystorhinostomy was done



A 49 Years old female with history of EPIPHORA for 1½ years presented with mucocele for 4 months Patient was on Oral Antibiotics for 2 weeks followed by external dacryocystorhinostomy was done

DISCUSSION:

Measuring Success: Published success rates of lacrimal surgery are difficult to compare because different criteria have been used to measure success. Several studies have considered improvement in epiphora as a measure of success, rather than categorizing in complete or partial relief, with the outcome being higher rates of "success" being reported. We used the Royal College of Ophthalmologists' published guidelines for clinical governance, which suggest that the outcome of lacrimal surgery should be measured as symptomatic epiphora relief categorized in three levels (absence, improvement, or no change).⁶ Although absence of epiphora would be considered successful by both physician and patient. Whether partial relief is considered successful would depend on the patient's level of satisfaction with the procedure.

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Success of Trephination Procedure: Trephination and silicone stent intubation can be an effective method of treating canalicular obstructions, particularly in cases where the obstruction is located closer to the lacrimal sac.⁷ In our series, the overall success rate, for all level of obstruction within the canaliculi combined, was 49% complete epiphora relief, 38% partial relief, and 13% no improvement.

Distal lower canalicular obstructions had the highest success rate (80% complete and 20% partial relief of epiphora), whereas the lowest success rate occurred in proximal bicanalicular obstructions (55% partial relief and 45% no improvement). This indicates that the procedure is less effective for obstructions further from the lacrimal sac.

Distal lower canalicular obstructions, distal bicanalicular obstructions (67% complete and 33% partial relief), and common canalicular obstructions (59% complete relief, 29% partial relief, and 12% no improvement) were shown to have higher success rates than the average.

Trephination Compared With DCR and Jones Tube: The standard treatment for canalicular obstruction, DCR with Jones tube, has reported success rates ranging from 57% to 100%.^{8,9} with most published success rates between 83% and 97.7%.¹⁰ Our study demonstrates that similar success rates are achievable with the trephination procedure for distal lower and distal bicanalicular obstructions, particularly when partial improvement is considered successful. Patients with common canalicular obstructions had lower surgical success rates than most of the reported studies of DCR with Jones tube placement and have similar success rates only if partial relief is considered included. Nevertheless, compared with CDCR with Jones tube placement, our complications were few and relatively minor. It is also important to note that DCR with Jones tube placement can be offered to patients at a later date if the results of the trephination procedure are not satisfactory.

The Difficulty with Proximal Obstructions: Lower success rates and more complications were found to occur in patients with proximal obstructions who underwent the trephination procedure like false-passage formation one possibility concerns the fact that the canaliculus converts from a vertical orientation to a horizontal orientation. This acute angle change may lead to a higher restenosis rate. In addition to causing a higher false-passage rate.

Drawbacks: The drawbacks of this study relatively small size, lack of appropriate controls. The study did however, reveal some information regarding varying success rates with different anatomic locations within the canaliculus. With regard to the definition of success, the issue of anatomic versus functional patency might have been clarified if post stent removal canalicular probing/irrigation had been routinely performed.

CONCLUSION: From the observations of the present study carried out on 120 eyes of 120 patients of known case of epiphora following conclusions have emerged out:-

Epiphora is most common in the age group of 40-50 years (66 patients).

Prevalence of epiphora is more in common in females (70%) than males (30%).

The mean period of epiphora in our study was 1.5 years ranged from 0.5 years to 3.5 years. It also seems safe to conclude that clinically recurrence of epiphora does not occur within 6 months of surgery.

Syringing and probing are the main tests for the investigation of epiphora and level of block in Nasolacrimal system.

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Syringing is traditionally done in patients of epiphora after ruling out ocular surface disorders and other intraocular causes. Jones dye test used to rule out anatomical and functional causes of epiphora.

Our study showed statistical correlation between level of block and type of surgery done. Though it was found that more proximal block to punctum, less chance of alleviation of epiphora, surgery based on the level of obstruction.

More distal block from punctum and absence of chronicity of epiphora appeared to have successful surgical outcome.

In conclusion, our study suggests that canalicular trephination and silicone stem intubation should be considered as an alternative treatment for distal canalicular obstructions. Highest success rates were seen in distal lower canalicular obstructions followed by distal bicanalicular obstructions and common canalicular obstructions.

Although the lower success rates occurred with proximal obstructions, the canalicular trephination and standing could still be considered as a primary procedure before resorting to a permanent indwelling foreign body.

Statistically significant correlations were observed between the level of obstruction to according surgical procedure and alleviation of epiphora. On follow up the correlated with recurrence of epiphora. No correlation was found between infectious and idiopathic causes of epiphora to the surgical outcome.

Initial duration of epiphora may be a reliable predictor of the surgical outcome in patients with obstruction of nasolacrimal obstruction. Eye with proximal canalicular obstruction may have increased risk of recurrence. Factors significantly associated with recurrence of epiphora during follow up of patients after surgery included proximity of block and chronicity of disease.

This study identifies punctoplasty is the surgery of choice for punctal occlusion. In unicanalicular obstruction trephination with mini monoka stent has better surgical outcome. In patients with distal common canalicular obstruction bicanalicular silicone tube intubation with external dacryocystorhinostomy is the procedure of choice.

In patients with nasolacrimal duct obstruction external dacryocystorhinostomy has a good surgical outcome.

Success of canalicular trephination and silicone stent intubation for treatment of canalicular obstruction is based on the site of obstructions. Distal monocanalicular obstructions have the highest degree of symptomatic epiphora relief, followed by distal bicanalicular, common and proximal obstructions.

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